

**A CRITICAL EVALUATION OF CONSERVATION AND
DEVELOPMENT IN SUB-SAHARAN AFRICA
“LAST CHANCE AFRICA”**



by

PAUL ANDRE DEGEORGES

&

BRIAN KEVIN REILLY

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DEDICATION

To our parents Roger and Mary DeGeorges, and Pat and Hazel Reilly raising us to stand up for what is morally right and to never compromise our beliefs in attaining the truth – and to Africa – the only continent with a soul (Hemingway).

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FOREWORD

AFRICA! The name sparks the imagination of people throughout the world. For many, it is a land of charismatic mega-fauna and unfathomable biodiversity. For others it holds interest because of its rich and complex history, culture, and geopolitics. For still others, it speaks of opportunity to exploit its vast resources. For me, as a child, Africa was a place that captured my imagination like no other – wild and full of creatures of all manner and shape. It still does, but my collective knowledge of Africa, beyond its wildlife and conservation, is limited to what I read in newspapers and magazines. This book provides the portal through which that collective knowledge grew to encompass many facets of Africa, its people, and its history.

By modern standards, Africa is plagued by civil/political strife, poverty, and unsustainable population expansion. The continent has tremendous resources, yet it seems that most of the people do not benefit from these riches. Therefore, our thoughts about Africa often take on a sense of hopelessness about its future, its people, and its wildlife. In this book, Drs. Andre DeGeorges and Brian Reilly bring a wealth of experience to their assessment of the past and current state of African conservation, particularly wildlife conservation, but also of fisheries, water, vegetation, and soil conservation. Their effort is an odyssey through time with a central focus on African cultural history, the history of failed conservation and “development” plans by foreign organizations and governments, and the effects of these failures and historical events with respect to African ecology, people, and cultures.

This is a remarkable book, both in its scope and depth. Its greatest value is that it has something of interest for everyone, and perhaps that is something that may also find critics. The authors hold strong opinions and criticisms of past and current African conservation, economic aid/development, and “outside” efforts to influence African conservation. They present a litany of failed conservation and humanitarian projects across the continent. Thus, this book will surely be controversial. Although I disagree with some of their assessments, the benefit of the exposure to a vast array of historical failures changed my thinking about the role of external influence on the internal affairs of Africa. Disagreements are healthy, but they are ancillary to the authors’ theme and intent of exposing a broad range of recent failures in African conservation and humanitarian efforts.

They begin their journey with the explicit recognition that humans evolved in Africa. This hypothesis is generally accepted by anthropologists, and seems unrelated to a book on conservation, but it sets the foundation for later theses that emerge throughout the book. One of which is the notion that if wildlife and humans co-evolved in Africa, then that should have suggested to colonialist powers that the Africans they subjugated actually might know how to manage and conserve their wildlife and natural resources. DeGeorges and Reilly provide extensive historical background to demonstrate that well developed resource management systems were in place all over Africa and these were either not recognized or discarded in favor of “superior” management systems (deemed so by the colonialists). They also suggest that colonialists wanted to disenfranchise the indigenous Africans from their resources for their own personal gain. The reasons for this are many, but clearly the intent of invasion of another people’s territory by colonialist powers was not to assimilate the values and culture of the invaded cultures as their own. Moreover, the authors propose that there was not even recognition among colonialists that indigenous Africans had well developed viable natural resource conservation systems. The colonization of Africa by

foreign powers largely caused the loss of indigenous resource systems over much of Africa, which the authors propose is partly at the root of Africa's current conservation crises. However, the authors also contend that a new form of colonialism (neo- or eco-colonialism) has been occurring within the conservation and resource exploitation arenas because well meaning organizations and others are making the same mistakes as in the past – the real interest is not in what Africans and Africa needs but what they want from Africa in terms of conservation. This neo-colonial conservation may possibly lead to more degradation of African resources and ultimately represents a direct threat to African conservation, its people, and its biodiversity.

Lest one is left with the impression that Western cultures are all bad and indigenous cultures are all good, the authors set a historical background that shows many of the ills of humanity were present in Africa prior to Western colonialism (for example, slavery, intertribal warfare, forceful appropriation of other's land, and religious genocide). Thus, one cannot place all of the ills of modern Africa at the feet of Western countries because past African history has its own sordid elements that complement some equally tragic current political situations (the current situations in Zimbabwe and Darfur for example). The history presented in this book clearly shows a continent that had been in constant cultural evolution while maintaining substantial harmony in land and resource conservation. Nevertheless, the cultures of Africa were complex and had well developed social and resource allocation systems before colonial powers arrived – many of which were quite different from area to area but achieved the same conservation goals. It will be obvious to readers that pre-colonial Africa was quite different than modern Africa because of a high ratio of land/resources to human population density. Yet, strategies existed such as spreading the risk when using multiple resources, division of labor among resource users, rules of conduct when using resources, and active management interventions, all of which suggest

a high degree of sophistication and codification of indigenous ecological knowledge. African systems were developed through trial and error, and hence not “scientific”. But the price of failure was death or severe deprivation so the selection forces over the eons to develop sound systems were strong. The authors detail the remarkable diversity of resource use and allocation systems that many cultures and tribes had developed in Africa, which establishes a foundation that Africa is a singularly complex continent in every facet. Readers will be struck that other “modern” constructs of resource management principles (such as land rest-rotation, adaptive management, dispute resolution) were well established in pre-colonial Africa.

DeGeorges and Reilly discuss in detail the importance of hunting to Africans, in both historical and modern terms. Hunting in Africa is often portrayed in Western media as a dichotomy of either the bushmeat-endangered species trade-poaching triad or trophy hunting by wealthy visitors to Africa. Usually, both are presented in a negative light. Yet the authors show that hunting has deep cultural and mystical roots in Africa and that wildlife has provided a utilitarian foundation (protein, hides, and other products) for its people. They are also critical of some facets of the modern dichotomy, but conversely supportive of the continued exploitation and use of wildlife by both indigenous people and those who travel from far lands to hunt African game. In fact, they provide examples of African hunting that show trophy hunting is neither a modern invention nor Western-developed activity because some African cultures practice various forms of trophy hunting. There are many statements about culture by the authors, which will certainly open the door for scholarly investigation by students of African cultural diversity. In essence they deem the survival of African wildlife and its habitat to be directly linked to its potential for exploitation by Africans and foreigners in a sustainable manner for meat production and for trophy hunting – this is the

paradox of hunting in modern society, for many wildlife species to survive they must have economic value.

The authors assess many failures of past and current conservation projects in Africa. It would be easy to simply say that Africa's conservation ills are the result of failed foreign intervention but that would be wrong. The historical accounting makes one reflect on the inequities and strife that Africans wrought on each other over time that were independent of external influences. For example, when the authors discuss cattle and grazing, one starts to think about the developing inequities within many African groups where a king or the elite of the tribes had special privileges with respect to cattle ownership or grazing rights. So the historical accounts allow the reader to place some of the modern failures in context and perspective – Africans were not supremely wonderful and “Westerners” were not all bad because certainly bad things were happening to human dignity and equality well before the arrival of “Westerners” *en masse* to the continent. The contrast between Western and indigenous politics and interventions does not even consider the forceful spread of Islam over much of northern Africa, which had its own consequences for the indigenous cultures and beliefs and continues today.

Why have so many seemingly well-meaning modern economic development or conservation projects failed in Africa? This question also is complex and is explored in great detail by the authors. The strategy by the authors is to state a problem, then present their own experience with a project that reflects the problem, and then follow the case history by a synopsis of what went wrong and often what could have been done to prevent it. Some failures can be classified as “silly mistakes” (Caughley and Gunn 1996, “Conservation Biology in Theory and Practice”). An example of a silly mistake is creating a conservation or development plan that may make social sense (desire to help people) but is

doomed to failure because there are obvious negative ecological consequences of a plan (disrupting a natural hydrologic system in order to create an irrigation system). A narrow, short-term potential benefit would be far outweighed by a widespread, long-term negative effect. Other plans fail because they are politically expedient (an external government gives aid to the host country to win political favor), have good goals and intent but the wrong methods or constituency (community-based hunting programs), or are attempts by outside groups to influence government policy (attempts to restrict hunting or culling of wildlife or use of specific land areas). Still other failures occur because traditional systems are discarded in favor of Western systems, which may not be appropriate to either the ecological setting or the manner in which people use and share resources. The bottom line for the authors is that local people have to have both a vested interest in and a direct benefit from any conservation plan before it will succeed. Many plans fail for obvious ecological reasons, but many others fail because external interests do not understand or consider meaningful local interest. The authors believe that conservation in much of Africa is doomed to fail if local people do not benefit directly from conservation and do not have a controlling interest in local conservation plans.

The message the authors continually portray is that Africa is historically and culturally diverse, but so are the problems that now beset the continent and its people. The authors' diverse examples of failed programs and problems express this diversity in a way that is both sad and interesting. There are so many reasons why non Africans are interested in Africa that a single model cannot be used to explain the failures or provide solutions. I suggest to readers that they maintain an open mind as they read the book to gather all perspectives. The book is like a tapestry; one cannot view a single thread and understand or appreciate the whole.

I learned a great deal about Africa reading this book, but I was struck by the enormity of the problems and the scale of failures – some well meaning and others not. Their discussions of the interplay and scale of global economics, commodity subsidies, foreign government economic policies, and the power and goals of multinational corporations was like a spider’s web that has trapped the poor of Africa. The discussion portrayed CITES (Convention on International Trade of Endangered Species) and the ESA (U.S. Endangered Species Act) in a relatively negative light, which was enlightening to me because I support the basic premise of both CITES and the ESA. The influence of special interests (particularly anti-hunting groups) to control conservation in Africa is “eco-colonialism” in the eyes of the authors. These special interests have attempted to block African use of wildlife resources, without compromise in some situations, and can be viewed as a modern mechanism to keep poor Africans disenfranchised from wildlife and land – the authors also believe this is a form of “eco-genocide.” This control is done directly through CITES Conference of Parties actions or indirectly through pressure on Western governments to exert influence on or threaten African countries with lower economic aid.

The authors’ passion and love for Africa and its people comes through strongly in this book as does a message of frustration. The documentation of failed economic aid, conservation failures, global economic impacts on poor people, and political corruption can be numbing at times such that one wonders “can Africans lift themselves out of poverty and despair?” This will be difficult, but the messages in this treatise are clear: imposition of Western ideas and resource management systems have largely failed in Africa, African conservation must seriously integrate indigenous people with conservation if wildlife and its habitats are to survive, economic globalization is having huge negative impacts on Africa and its people, external government policies and pressure have negative influences on African nations’ internal politics and economics, the cycle of dependency of

African nations on donor handouts needs to be eliminated, Africans need to regain control of their land and their natural resources, and African conservation should ultimately be led by Africans. The authors suggest that although the “West” values Africa and its resources, the examples show that it has not done well in providing either effective aid or advice to Africans. They believe this will ultimately have great consequences for both Africa and the rest of the world. Despite the many examples of conservation and development failures, the authors are not anti-government, anti-aid, anti-West, or anti-hunting. Their case histories of failures reflect the way in which much aid, many governments, and many special interests groups either have sinister motives and express actions that hurt Africans and African conservation or their aid and actions are ill advised.

Everyone who loves Africa, who works in Africa, or sets policy in or out of Africa should read this book. DeGeorges and Reilly establish a recurring theme that Africans should control their own destiny and at this time they don’t. The details in their book simply support this theme. As I read this book, the thought occurred to me: for those who are not African but who work in Africa, why do you do it? Are you part of the solution or part of the problem? Does your effort result in the development of leadership or self-sufficiency among Africans with whom you work or depend upon? These questions require careful introspection and self-honesty. The answers should tell you whether you should either continue your work, continue your advice to Africans or rethink your motives and priorities regarding your work in Africa.

The authors recognize the daunting challenge of reversing the downward spiral of both African conservation and the living conditions of poor Africans. Both will require aid, but the right type of aid - aid that benefits people directly and not corrupt politicians. They recognize and support many of the humanitarian and watchdog organizations working in Africa. They recognize the situation is so

dire that Africa's best and brightest are leaving the continent when the opportunity arises (the “brain drain”) and this must be reversed if Africa is to meet the challenge of globalization or self sufficiency. Africa, its people, and conservation of wildlife are in crisis – this is clear. What is not clear is what should be done and who should do it? Here the authors conclude their *magnum opus* with a recapitulation of the issues and present a way forward. This way will not be easy nor are they naïve enough to think that it will be, yet it is a framework that everyone should think about and consider when engaged in Africa. At its core, is the recognition that Africa belongs to its people, of whatever race, and that the wildlife and resources I dreamt about as a child requires this acceptance if they are to be conserved.

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PREFACE

In the first decade of the 21st century the state of Africa as a continent has become a very topical issue. The authors, as conservation practitioners having witnessed first hand the state of the continent in terms of its conflicts, corrupt and ineffective government and general inability to compete on the world stage in juxtaposition to its wealth in resources and people and are forced to ask how this came about, and the likely consequences for the wildlife with which we are so intimately involved.

The future of the ecosystems and protected areas of the subcontinent that are etched into the minds of generations of First World children have a future that is fundamentally tied to two issues – neither of which surface in the minds of Westerners that so dearly want to ensure the survival of the wildlife riches of Africa; people's survival and trade in commodities.

As we contemplate issues protected areas and the supporting ecosystems are inundated with people forced to scratch a meager existence from their surrounding natural resources whilst the world's commodity traders exchange Africa's hard won resources whilst offering ecotourism opportunities to First World, would be Hemingway's, the bulk of the proceeds skillfully maneuvered to destinations other than Africa.

In reviewing the potential future of conservation on the subcontinent, the authors have been forced to take a few steps backwards in considering the history of conservation on the subcontinent and in considering case studies and the role of outside role players in Africa's conservation. We have come to the conclusion that in the absence of organized development in Sub-Saharan Africa we may lose all the protected areas and their associated wildlife in the next generation.

Clearly Sub-Saharan Africa's conservation problem arises in the existence of charismatic mega-fauna – survivors whilst the rest of the Pleistocene contingent very rapidly joined the list of the extinct in recent natural history. We ponder the role of co-evolution between man and this wildlife in Africa (contrary to attempts by First World scientists at proving otherwise) and its survival to modern times. Our research has shown that man in pre-colonial Africa adhered to many societal rules that related to the use of natural resources and the need for “conservation” was absent.

In ancient times already, the then civilized world manifested its fascination in the Dark Continent in its collections of animals and trade in metal and wildlife products whilst already forming negative opinions of the inhabitants. We review the upheavals of colonialism, where similar to the North American experience, the sedentarization of people was largely motivated by control of populations and their re-education in Christian ways. This was attended by the paradigm shift of people from nomadic pastoralism with its innate rotation of resource use to sedentary agriculture in ancient soils and arid environments incapable of sustaining temperate climate First World high yield agriculture. The removal of the limitations of constant movement, disease and guaranteed food supplies have directly resulted in population numbers that now burden Sub-Saharan Africa. Concomitantly the colonist's eradicated wildlife (as a disease reservoir and a cash cow) and established enterprises linked to provision of cheap resources to the colonial powers.

The post colonial period saw Sub-Saharan Africa's white political elites replaced by black political elites that very quickly became polarized in the Cold War tug of war. The United States, as the pre-eminent post world war world power, has dabbled in many areas of the subcontinent using either surrogates or its agencies.

Foreign aid became the tool of influence most of which flowed back to the country of origin. The focus was on infrastructural development projects but without due concern for people and environments disrupted in the process or the recipients ability to maintain this infrastructure. To this day Africa remains clearly demarcated in terms of ex-colonial power influence and strong ties to London, Lisbon, Paris and Berlin.

Multinational corporations and a plethora of conservation non-governmental organizations continue to hold sway in many Sub-Saharan African countries, whilst the raw materials flow unabated northwards and people languish in poverty. An in-depth analysis of community based natural resource management projects has been included by the authors.

The exception to the above has been South Africa where the white Afrikaner threw down roots and developed a First World agricultural society based largely on the temperate grasslands of its central inland plateau. The discovery of gold fueled the creation of a world class industrial complex, and even though the Afrikaner commandos lost their war of independence against Britain, this small country enthusiastically embraced the 20th century. Its ultimately failed social experiment of “Apartheid” with its marginalization of the black majority saw its industries accelerate to the fore in arms development and production, having gone nuclear in 1979. Post 1994 the subcontinent has seen South Africa’s soldiers replaced by its entrepreneurs, professionals and scientists as the conduit for the development of the subcontinent. Although South Africa itself teeters nervously in dealing with poverty and unemployment, crime, illegal immigration and brain drain, its neighbors derive massive benefit from its economic muscle.

It is against this backdrop that the authors build an argument that unless orderly development takes place on the subcontinent attended by devolution of resource

control and beneficiation of resources, that Sub-Saharan Africa will ultimately lose its protected areas to human pressure, whilst preservationist NGO's mutually backslap one another on non-existent successes and raise more money on perceived threats to species. There is still much wildlife in Sub-Saharan Africa, but with shrinking habitats caused by people forced to scratch out a living – this in spite of Governments not because of them.

Our discussions and arguments within this tome may at times indicate that we are anti-hunting or anti-foreign aid but quite the contrary – we make an all encompassing case for the utilization of Africa's resources with beneficiation of people on the ground as the primary outcome. As we indicate, foreign aid, used for important development catalysts such as health, nutrition and education is important. However, when 70 to 90% of foreign aid returns to the country of origin, when the West takes more than it gives, when foreign aid becomes a form of global welfare - more important than foreign direct investment and the transforming of Sub-Saharan Africa's raw products on the continent, or it allows leaders to shirk their duties of reinvesting the subcontinent's wealth back into development as opposed to weapons of war, then yes we have a problem with foreign aid. Until Sub-Saharan Africa urbanizes and industrializes, habitat loss from large numbers of people scratching an existence from the land will be the biggest threat to the last great assemblages of charismatic Pleistocene mega-fauna.

Professor Brian Kevin Reilly

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May God bless you all!

INTRODUCTION

“There is nothing new in the world except the history you do not know.” Harry Truman In: Kinzer (2003).

“To understand the future you must understand the past”
(Kibonde, *pers. comm.*).

This book takes a fresh look at Sub-Saharan African conservation and development at the beginning of the 21st century and suggests a possible way forward. Parks and protected areas are rapidly becoming hard-edged, surrounded by a human population living a subsistence life style, and expected to increase from 622 million to between 1.5-1.8 billion people in the next 50 years. The soils and savannas of the subcontinent, as currently used, have far exceeded their capacity to provide an acceptable quality of life for the majority of rural inhabitants. Undernourishment and malnutrition, poverty, high infant mortality, a lack of educational opportunities and poor health care are endemic. To make matters worse, economies tend to be stagnant or declining with negative per capita Gross Domestic Products (GDPs).

Given these pressures, one has to ask, how the natural systems and revered mega-fauna of Sub-Saharan Africa can possibly be expected to survive this human wave flowing over the continent. Already, there are only scattered pockets of wildlife left across the Sahel, a condition which is the combined result of man-induced climate change and habitat degradation linked to agriculture and livestock. This book delves into how the subcontinent has ended up in this precarious situation.

The book draws on the authors' combined 50 years of experience in ecological policy and planning for the U.S. government in the U.S., East and Southern Africa and the Caribbean, as well as for Sub-Saharan African governments, especially those of Senegal, the Gambia, Guinea and South Africa. It furthermore benefits from their representation of the sport hunting/conservation fraternity on the subcontinent, as well as from what has been learned from traditional hunters and other resource users in countries ranging from Senegal to Zambia. This book assesses the successes and failures of conservation and development to both conserve Sub-Saharan Africa's wildlife and other natural resources, as well as to sustainably use these resources as catalysts for development of the subcontinent and advancement of its people.

It analyzes Sub-Saharan African ecological systems from the top of the mountain down to the edge of the sea and specifically examines their ability to support increasing human and livestock populations. The reader is led from pre-historical times into the beginning of the 21st century. Case studies are used to support key objectives and answer key questions posed by the book, and are drawn from the authors' actual experiences in the field as well as from relevant literature. A discussion about the possible way forward is provided.

Unlike most overviews of conservation, which are narrowly focused, it takes what appear to be disjointed unrelated issues in Sub-Saharan Africa and demonstrates how there is a synergistic effect between different sectors that are impacting on the sustainable management of Africa's natural resources and by implication its economies, political stability, and ultimately the well-being of its people.

Map of Sub-Saharan Africa



Source: USITC (2003) with permission, United States International Trade Commission (USITC).

This following is discussed:

Prehistoric Africa

As background information, it is shown that Africa is the only continent in which humans co-evolved with wildlife. Also, there is a brief discussion about the evolution of modern human's physical, mental and social characteristics as a result of the hunting imperative.

Pre-Colonial Africa

An overview is provided of pre-colonial civilizations in Sub-Saharan Africa that were every bit as advanced as many European countries, co-existing with nature until the arrival of the European colonial powers. It also reviews pre-colonial civilizations' understanding of the ecology and dynamics of managing their natural resources, as well as their system of controlled access to these resources through social norms and religious beliefs of small-scale rural societies.

It is demonstrated throughout the presentation that until colonialism, humans and their actions (e.g., burning, grazing livestock, harvesting of fuel wood and charcoal) have been critical to the maintenance of wildlife habitat, including savannas, tropical grasslands, montane forests and dense humid tropical forests. The book assesses shifting slash and burn agriculture with long fallow fields developed by Africans to account for the poor soils, especially in the savannas that constitute 70-75% of Sub-Saharan Africa. The surgical removal of Africans from the rural landscape first by colonialization and today by modern conservation means that Western approaches have failed to recognize this role along with their strong cultural ties to and economic dependence on wildlife and associated natural systems.

Colonial and Post Independent Africa

It examines how the imposition of Western systems of governance and consciousness has changed the way in which Africans relate to wildlife and natural systems. It also looks at the preconceived view that Africans were both without civilization and had little or no knowledge or control over the management of their resources before the advent of colonialism. In addition, there is discussion about how European imperialism in Sub-Saharan Africa recreated the landscape in the eyes of the conqueror. This situation is compared to the conquest of North America, both in the treatment of indigenous people, recreation of the landscape, and the expropriation of wildlife and other resources including land.

It also considers the introduction of an inappropriate “plantation” or monoculture cash-crop agriculture in many areas of the subcontinent to provide cheap raw products to the “mother country.” It is demonstrated that this practice went ahead with little understanding that soils were/are only marginally suited if not completely inappropriate for permanent agriculture over a large portion of the subcontinent. The result has been massive soil and environmental degradation.

Misused Technologies

The book assesses the method of compression that was used to make way for colonial plantations, parks and game reserves, and also discusses the human population explosion in the 21st century. Once a viable technology, given current human populations on the subcontinent, the inappropriateness of slash and burn agriculture as currently practiced is also analyzed. In addition, it assesses the misuse of modern technologies in Sub-Saharan Africa and the tropics in general

that has resulted in further environmental degradation, making already uncertain lifestyles that rely on these environments for survival even more precarious. It also demonstrates that Western technologies introduced in the 20th century have the potential to play a vital role in development, but have often been misused, resulting in seriously adverse impacts on the ecology, traditional food production and rural people including:

- **Boreholes:** Boreholes which were inappropriately dug in rainy season grazing areas along with government policies (e.g., sedentarization, disregard for the importance of floodplains for dry season grazing, imposing intensive management systems on extensive pastoralists without appropriate training, land and resource tenure) encouraged over-grazing and savannah degradation across the continent.
- **Dams:** As a spillover from the big dam era in the United States, the idea of River Basin Planning was brought to Africa from the 1960's through to the 1980's. Rivers would be harnessed and controlled by Western technology to capture their energy for a range of purposes, including electricity, irrigation and transport. In Sub-Saharan Africa, to date the net result has been the destruction of downstream floodplains greatly reducing the carrying capacity for these systems to support man, livestock, fish, waterbirds and wildlife. The lofty goals of food-self-sufficiency and cheap electricity for all have not been achieved.
- **Inappropriate coastal tourism development:** Here the treatment and discharge of sewage and “gray” (wash/bath) water, as well as economic development have had a negative impact on maintaining key habitats such as coastal lagoons, mangroves, grass beds and coral reefs, and have also adversely affected related fisheries and fisher communities. The Caribbean experience serves as an example from which many lessons can be learned, especially for the east coast of Africa, which is just beginning

to develop its coastal areas. Similar signs of inappropriate development are slowly emerging from Mozambique to the Red Sea.

Community Based Natural Resources Management

It analyzes Community Based Natural Resource Management (CBNRM), a new concept emerging out of Southern Africa. CBNRM attempts to integrate people into conservation through material rewards (meat and money) in order to take pressure off the natural land-based systems. A major problem is that CBNRM has become a pawn in the international ideological battle between the Western-based animal rights and sustainable use movements. Both ideologies are at fault for not dealing with the more pressing issues at hand such as land and resource tenure, the continued existence of neo-colonial relationships between government and the private sector that results in the inequitable distribution of benefits to rural communities, lack of educational opportunities and alternative livelihoods for rural Africans, as well as the low resource to population ratio. This cries for broader solutions of which conservation only forms a very small part of the larger puzzle. The evolution, strengths and weaknesses of CBNRM are analyzed and recommendations made for the way forward.

Onset of the Cold War and Eventual Globalization

During the 20th century, Sub-Saharan Africa's human population increased 5.5-6.5 times. The latter half of the 20th century saw "winds of change" sweeping across the region. First came independence from the colonial powers, followed by the Cold War where Sub-Saharan Africa served as a chessboard for the superpowers playing out their ideologies, each striving to control global politics. At the dawn of the 21st century, Sub-Saharan Africa is being adversely impacted by globalization and a desire for continued access to cheap natural resources to

drive Western and more recently China's economies. The current and potential role of the international private sector in natural resource management and development of local, national and regional economies is examined.

Impacts of National and International Policies on Governance, Conservation and Development

It demonstrates that given the current human population and its projected growth in Sub-Saharan Africa, conservation on its own will fail, as natural systems will have a difficult time surviving the onslaught from this human wave of poverty living rural subsistence lifestyles. The situation will remain serious, even if 50% of the population of Sub-Saharan Africa is urbanized by 2020. The impacts of foreign aid, structural adjustment, debt relief, Convention on International Trade in Endangered Species (CITES), trade, subsidized agriculture in the West and food dumping are discussed as they impact upon Africans, governance, economies and conservation on the subcontinent. Cultural constraints linked to these development and conservation policies/tools are also analyzed.

The Way Forward

A vision for the way forward is provided that must be driven by Africans, and which fits into and is compatible with their socio-economic and cultural mores. The authors contend that in order to take the human population pressure off the rural resource base, Sub-Saharan Africa will be required to go through the same urbanization and industrialization process as the U.S. and Europe underwent in the 20th century. At the same time, however, there must be improvements in the management of soil, water, vegetation and wildlife in rural areas. Ideas on how to achieve these goals are presented in the final chapter. Ultimately, the future of

modern civilization may be more closely tied to and dependent on the development of Sub-Saharan Africa than most people realize.

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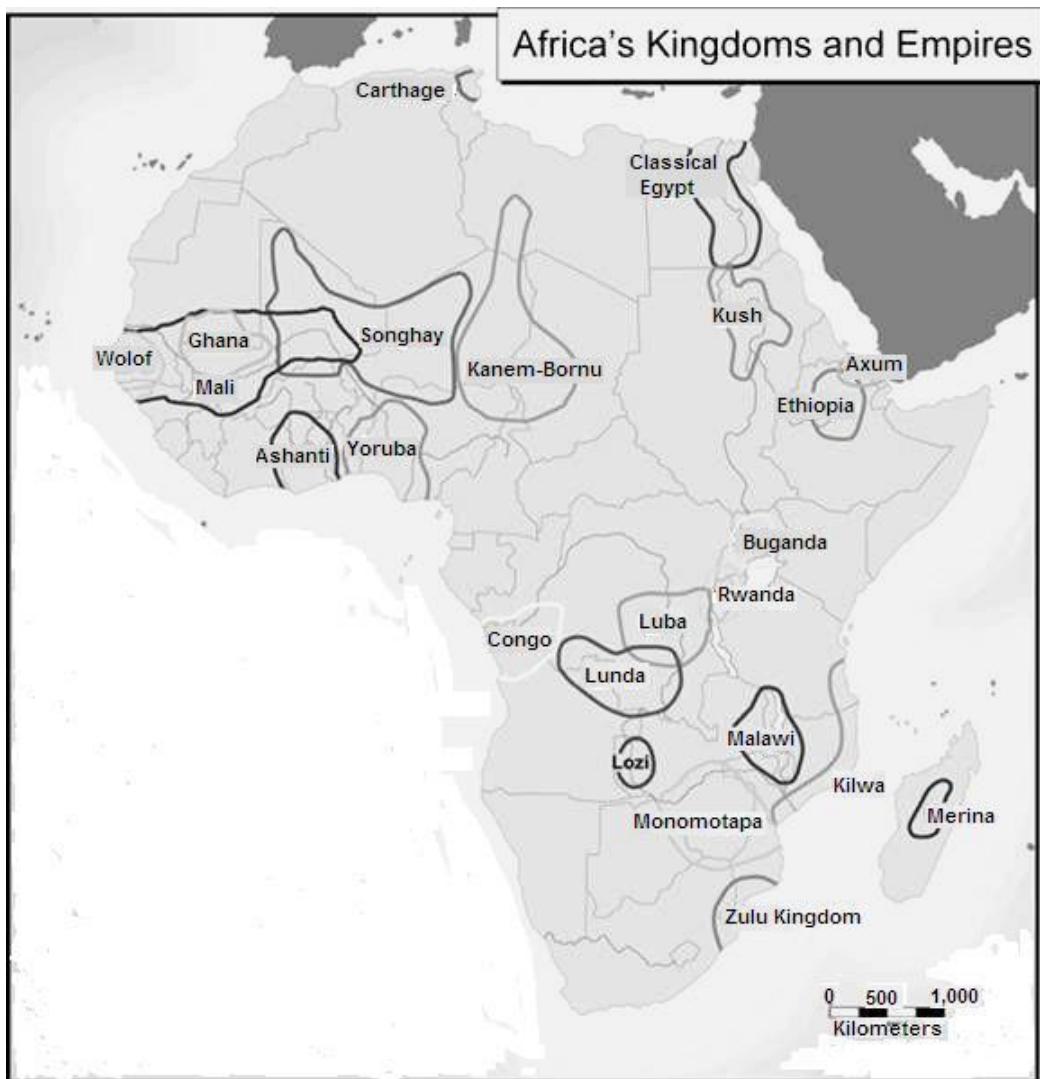
Chapter 1

1.0 PRE-COLONIAL SUB-SAHARAN AFRICAN CIVILIZATIONS AND CO-EVOLUTION WITH WILDLIFE

“The vast majority of the world’s biological diversity is not in gene banks, zoos, national parks or protected areas. Most biological diversity is in landscapes, whose great collective accomplishment is to have conserved the great variety of remaining life forms, using culture, the most powerful and valuable human resource, to do so” (Nietschmann, 1992 *In:* Langton, 2003 *In:* Adams & Mulligan, 2003).

While many assume that traditional African societies were backward, this is far from the truth. Sophisticated kingdoms and empires existed such as Kush, Nubia, Aksum (Axum), Fulani, Mali, Songhai, Ghana, Sudan, Kanem-Bornu and Hausa states, Luba and Lunda States, Ethiopia, Yoruba, Ashanti, Dahomey, and Zulu. Smaller city-states also developed, often linked to trade, such as Lamu, Malindi, Mombasa and Mwene Mutapa (Monomotapa) (Figure 1.1). These societies were well structured with organized and functioning systems of governance. Armies served to protect and expand their realms of influence and controls over access and management of resources.

“When they (European navigators) reached the Bay of Guinea and alighted at Vaida, the captains were astonished to find well-planned streets bordered for several leagues by two rows of trees; for days they traversed a countryside covered by magnificent fields, inhabited by men in colorful attire that they had woven themselves! More to the south, in the Kingdom of the Congo, a teeming crowd clad in silk and velvet, large States, well ordered down to the smallest detail, powerful rulers and prosperous industries. Civilized to the marrow of their bones...This flowering the European conquistadors destroyed as they advanced” (Quote Frobenius *In:* Diop, 1974; The Sankofa Project, 1999).



Source: ANON (2002a) with permission, Michigan State University

Figure 1.1: Africa's pre-colonial kingdoms and empires

1.1 PRE-HISTORIC AFRICA – THE CRADLE OF MANKIND

1.1.1 Geological Timetable and the Evolution of Humans

Humans and their ancestors evolved in Africa. The key geological time frame for this process is structured as follows (MacRae, 1999; USGS, 2004):

Mesozoic Era, 245-65 million years ago (BP) (USGS, 248 - 65 million years ago)

- **Triassic Period**, 245-190 million years ago (USGS, 248 - 213 million years ago)
- **Jurassic Period**, 190-136 million years ago (USGS, 213 - 145 million years ago)
- **Cretaceous Period**, 136-65 million years ago (USGS, 145 - 65 million years ago)

Cenozoic Era, 65 million years ago to the present (USGS, 65 million years ago – to the present)

- **Tertiary Period**, 65-2.5 million years ago (USGS, 65 - 1.8 million years ago)
 - **Paleocene Epoch**, 65-54 million years ago (USGS, 65 - 55.5 million years ago)
 - **Eocene Epoch**, 54-38 million years ago (USGS, 55.5 - 33.7 million years ago)
 - **Oligocene Epoch**, 38-26 million years ago (USGS, 33.7 - 23.8 million years ago)

- **Miocene Epoch**, 26-7 million years ago (USGS, 23.8 - 5.3 million years ago)
- **Pliocene**, 7-2.5 million years ago (USGS, 5.3 - 1.8 million years ago)
- **Quaternary Period**, 2.5 million years ago to the present (USGS, 1.8 million years ago – to the present)¹
 - **Pleistocene Epoch**, 2.5 million to 50,000 years ago (USGS, 1.8 million - 8,000 years ago)
 - **Holocene Epoch**, 50,000 years ago to the present (USGS, 8,000 years ago – to the present)

The first mammals evolved from land-living reptiles as small, furry, warm-blooded, shrew-sized mammals about 190 million years ago. They co-existed, living side by side with the more dominant dinosaurs during the Jurassic and Cretaceous Periods. About 65 million years ago at the beginning of the Tertiary Period, there was an extensive evolutionary radiation of mammals as they exploited and filled the many niches that were vacated by the massive extinction of dinosaurs (MacRae, 1999).

The Cenozoic Era is known as the “Age of Mammals”. Primitive mammals that existed in the final phases of the Cretaceous Period, about 65 million years ago, included multituberculates, which evolved into monotremes such as the duck-billed platypus and marsupials with descendants such as the kangaroo and

¹It should be noted that some minor differences exist between time scales as estimated by different references. There is, however, a more conspicuous difference between MacRae's (1999) estimate that the Pleistocene Epoch dated from 2.5 million to 50,000 years ago and most other references which place the same epoch between 1.8-1.65 million to 12,000-8,000 years ago (Burkhardt, 1995; USGS, 2004; UCMP, 2004; Illinois State Museum, 2004).

opossum. There were also placentals from which the earliest primates developed 65 million years ago (MacRae, 1999).

The order primates can be subdivided into two suborders (MacRae, 1999):

- Prosimians (before apes), including lemurs, sifakas, aye-ayes, tarsiers and lorises (e.g., galago); and;
- Anthropoids, including monkeys, apes and humans.

The split between these two suborders began during the Oligocene Epoch in Africa. The anthropoids rapidly spread throughout Africa, Europe and Asia. The New World monkeys (now restricted to Central and South America), the Old World monkeys, who came a little later on, (now distributed in Africa and Asia), as well as apes and humans all began with a common ancestor some 30 million years ago (MacRae, 1999).

In the early Miocene Epoch, Africa's climate was warm with high rainfall and covered in tropical forests with apes forming a substantial portion of the mammalian fauna. The *Proconsul* of this period is believed to be a common ancestor of both the great apes and humans. Evidence suggests that the split between humans (Family Hominidae) and the great apes of Africa (Family Pongidae) occurred during the late Miocene Epoch, the gorilla separating from the ancestral stock about 9 million years ago and the chimpanzee about 7 million years ago (MacRae, 1999). Peterson (2003) places the separations as follows:

- The orangutan split off about 12 million years ago with 96.4% of its genetic material (DNA) identical to that of modern humans;
- The gorilla split off about 7.5 million years ago, sharing 97.7% of its genetic material with modern humans;

- The chimpanzee and bonobo split off 6 million years ago, sharing 98.7% of its genetic material with modern humans.

This means that the modern human is genetically closer to a chimpanzee and bonobo than a zebra is to a horse or an African elephant is to an Indian elephant (Peterson, 2003). Diamond (2005) argues that humans' co-evolution with wildlife in Sub-Saharan Africa and these close genetic ties are the primary causes for diseases such as HIV/AIDS, as the latter requires "the least adaptation to jump species" (see Chapter 5, Section 5.8.1, Linking HIV/AIDS to the Bushmeat Trade).

The oldest fossil thought to be in the family of man is the *Ardipithecus ramidus* from Ethiopia, dated at about 4.4 million years ago, though an incomplete skeleton makes it impossible to determine if it was bipedal (walked on 2 legs). The 4 million year old *Australopithecus anamensis* from Kenya is the oldest confirmed bipedal ancestor of man. It is hypothesized that climatic change associated with the Terminal Miocene Event caused the extensive forests and woodlands in Africa to shrink in favor of drier open savanna and grasslands, causing the modern human's ancestors to lose their arboreal security and requiring them to become bipedal in order to access the abundant savanna food supply, while at the same time avoiding predators. In recent times, however, the savanna hypothesis has been challenged (MacRae, 1999).

First found in Ethiopia, subsequently in Tanzania by Mary Leakey and finally in Sterkfontein, South Africa, the *Australopithecus afarensis* "Lucy" is dated to be up to 3.8 million years old and postulated to be the ancestral stock from which subsequent species evolved. The *Australopithecus africanus* discovered at both Taung and Sterkfontein, South Africa was most likely on the direct lineage leading to the modern human. A side-branch which became extinct, *Paranthropus spp.* (2.5-1.0 million years ago - Hilton-Barber & Berger, 2002) is

also believed to have arisen from *Australopithecus afarensis* (MacRae, 1999). Though research continues, Berger (1998) postulates, based on a combination of skull and limb comparisons, that *Australopithecus afarensis* (3.8-3 million years ago - Hilton-Barber & Berger, 2002) emerged as a human-like biped but eventually died out, while *Australopithecus africanus* (3.1-2.1 million years ago - Hilton-Barber & Berger, 2002), emerging at almost the same time in Southern Africa eventually evolved into *Homo habilis* (2-1.6 million years ago - Hilton-Barber & Berger, 2002) as it migrated north.

The fossilized lower jaw and skeletal remains, discovered at Olduvai Gorge, Tanzania by Jonathan Leakey and near Lake Turkana by Richard Leakey, are probably the oldest representative fossils of the genus *Homo spp.* to which humans belongs. These remains belong to *Homo habilis*, who evolved from *Australopithecus africanus* about 2.5 million years ago. *Homo habilis* is believed to have been capable of speech, the use of primitive tools (MacRae, 1999) and hunting (Ardry, 1966) with a brain half the size of the modern human's.

Leakey and Lewin (1995) discuss the “turnover-pulse hypothesis” of evolutionary pulses in humans, antelope, rodents and plants, among others at about 5 million (beginning of man) and 2.5 million (first *Homo sp. appears*) years ago, linked to global cooling. It is hypothesized that about 2.5 million years ago, shifting tectonic plates created the Great Rift Valley of East Africa, with the environment changing from a tropical lowland blanketed by green forests to a topographical mosaic of habitats including the dominance of drier climates. This would have resulted in 1) decreasing forest cover with increasing open savanna grasslands 2) humans becoming bipedal and 3) humans developing more athletic bodies and larger brains to cope with the development of stone tools and the need to communicate. These “human traits” are linked to hunting on open savannas as meat became dominant in the human diet.

About 1.8-1.6 million years ago, a new species of *Homo* sp. arose, which was called by various names from *Pithecanthropus erectus* to *Homo ergaster* to *Homo erectus*. It was first discovered by Richard Leakey around Lake Turkana in 1984. Research shows that it displayed an increased cranial capacity, used fire, hunted co-operatively and may have used semi-permanent shelters (MacRae, 1999). *Homo erectus* (2 million years ago to about 400,000 BC) is regarded as the first identifiable true human ancestor (Hilton-Barber & Berger, 2002). Peterson (2003) believes that the mastering of fire and the concurrent development of cooking between 1.7 and 1.5 million years ago significantly increased sources of available nutrition (e.g., roots and tubers) necessary for the development of a larger brain which consumes about 20% of human's total caloric intake.

Homo erectus has been found throughout the world, having migrated from Africa (MacRae, 1999), the first hominid known to have left Africa (Hilton-Barber & Berger, 2004):

- North Africa was reached 1 million years ago;
- China (Peking Man) and Java (Java Man) were inhabited about 800,000 years ago;
- Europe's first inhabitants occurred about 500,000 years ago.

A recent estimate, placing the Java Man at 1.8-1.6 million years of age, as old as their African kin complicates this hypothesis. There is also debate over a recent specimen found in Swartkrans, South Africa, classified as *Homo ergaster*, who used Acheulean hand axes not found among the remains of their Asian cousins. This indicates that cultural exchange and therefore inbreeding did not occur. The Asian species became geographically isolated before the development of the Acheulean culture in Africa (MacRae, 1999).

The discoverer of *Homo ergaster*, Ronald Clarke maintains that it is this species and not *Homo erectus*, which developed into the modern human, *Homo sapiens*. Two hypotheses now exist (MacRae, 1999):

- **Multi-regional hypothesis.** About 1 million years ago populations of *Homo ergaster/Homo erectus* emerged from Africa and spread to Asia and Europe, there slowly evolving into *Homo sapiens* at various widely spaced geographical centers, but without being reproductively isolated.
- **Out of Africa hypothesis.** All populations of *Homo erectus* became extinct between 100,000 and 40,000 years ago². *Homo sapiens* (200,000 years ago to present - Hilton-Barber & Berger, 2002) evolved from a *Homo ergaster/Homo erectus* stock, and a common population of primitive humans existed in Europe and Africa about 400,000 years ago as represented by *Homo heidelbergensis* (600,000-200,000 BC - Hilton-Barber & Berger, 2002) discovered in northern Greece (Petalona Skull), Zambia (Broken Hill Skull – “Rhodesian Man”), Saldanha Man from Elandsfontein, South Africa (300,000 years old) and Florisbad Man near Bloemfontein, South Africa (259,000 years old).

1.1.2 Out of Africa

The “Out of Africa” theory, based on genetic DNA (Deoxyribonucleic Acid) coding analyses has it that evolutionary divergence took place in response to the expanding Sahara desert, which acted as a genetic isolating barrier. The population to the north became the Neanderthals (*Homo neandertalensis*)

² Note that Hilton-Barber & Berger (2002) place extinction of *Homo erectus* about 400,000 BC ≈ 402,000 years ago significantly different from MacRae (1999) and Maywell (2003). Oppenheimer (2003) distinguishes between an African *Homo erectus* that is directly linked genetically to the evolution of modern man and would have died out much earlier compared to an Asian *Homo erectus* that existed until less than 30,000 years ago before dying out with no genetic traces in modern humans.

(230,000-29,000 BC - Hilton-Barber & Berger, 2002) of Europe and the Middle East and to the south of the desert, the first modern humans, *Homo sapiens* (MacRae, 1999).

Homo sapiens have been found ranging from 130,000 to 40,000 years of age in Southern Africa including (MacRae, 1999):

- Border Cave Man, South Africa/Swaziland border,
- Specimen, Klasies River Mouth, southern Cape, South Africa; and
- Springbok Flats Man, Tuinplaas farm on the Springbok Flats of the Northern Cape Province, South Africa.

It is believed then that modern humans spread in a second wave across the globe between 40,000 and 35,000 years ago, differentiating into the various races at a later date (MacRae, 1999; Maywell, 2003).

“Geneticists now believe that all humans alive today are descended from a single man who lived in Africa around 60,000 years ago...All modern humans evolved in Africa and then left in several waves of migration, ultimately replacing any earlier species...It isn't yet possible to establish whether modern man is entirely recent African in origin, or whether there has been 'hybridization/assimilation' between modern and archaic species”. However, “while the most recent male common ancestor identified through the y-chromosome lived 60,000 years ago, the most recent female common ancestor traced through mitochondrial DNA lived around 150,000 years ago. Whether an individual can be identified as our single common ancestor is open to debate. There's almost certainly not an Adam or Eve. Each of our genes has its own history, which could be passed on from different ancestors. It's more likely that a lineage can be traced back to a population of 50, 100, or even several thousand people” (Maywell, 2003).

Oppenheimer concludes that there are no genetic traces in living humans from either the European Neanderthals or Southeast Asian *Homo erectus*.

By around 100,000 years ago, several species of hominids populated the earth, including *Homo sapiens* in Africa, *Homo erectus* in Southeast Asia and China, and the Neanderthals in Europe (Maywell, 2003). The new immigrants to Europe, Cro-Magnon Man, an early *Homo sapiens*, successfully competed with the Neanderthal. Some authors argue that *Homo neandertalensis* was a distinct species (MacRae, 1999), while others hypothesize that *Homo sapiens neandertalensis* was a subspecies (Columbia Encyclopedia, 2004) that had existed for 200,000 years but became extinct 27,000 years ago being replaced by modern humans, *Homo sapiens sapiens* (MacRae, 1999). By around 30,000 years ago, the only surviving hominid species was *H. sapiens* (Maywell, 2003 & Oppenheimer, 2003).

Some researchers place the timing of human's (*Homo sapiens*) movement out of Africa as follows (Maywell, 2003):

- Hominids left Africa around 45,000 years ago (43,000 BC), reproduced rapidly, and settled in the Middle East; smaller groups going off to India and China. Isolated by mountains and sea for many generations, and exposed to a colder climate and less sunlight than in Africa, Asian populations became paler over time.
- Around 40,000 years ago, as the grip of the Ice Age loosened and temperatures briefly became warmer, humans moved into Central Asia. Amid the bountiful grassy steppes, they multiplied quickly. If Africa was the “Cradle of Mankind”, then Central Asia was its nursery.
- Around 35,000 years ago, small groups left Central Asia for Europe. Cold temperatures kept them there. Cut off from other groups, these migrants became paler and shorter than their African ancestors.
- From there, around 20,000 years ago, another small group of Central Asians moved farther north, into Siberia and the Arctic Circle. To minimize

physical exposure to the extreme cold they developed, over many generations, stout trunks, stubby fingers, and short arms and legs.

- Finally, around 15,000 years ago, as another Ice Age began to wane, one small clan of Arctic dwellers followed the reindeer herd over the Bering Strait land bridge into North America. Also isolated, they too acquired distinct physical characteristics.

Many archaeologists, however, believe that Australia, the Middle East, India and China were inhabited much earlier (Maywell, 2003). Geneticist Oppenheimer (2003) argues for a one time exit from Africa via a southerly route. He believes a major shortcoming in estimating the timing of modern man's movement about the globe is that scientific disciplines rely on radio-carbon dating that has a ceiling of about 45,000 year. By using computer modeling, looking at the DNA code (mitochondrial DNA inherited from the female line and the Y chromosome inherited from the male line) in people today and the rate of mutations, Oppenheimer has been able to retrace the genetic tree and determine where certain mutations took place (e.g. Africa, Asia or Europe) and approximately the time when they happened. He hypothesizes that an earlier attempt via a northern route out of Africa 120,000 years ago into the Levant (Israel and the Near East) failed as the earth entered into a period of glaciation about 90,000 years ago causing North Africa and the Levant to enter into a period of extreme desertification. Modern man died out and would not be found in the Levant until 45-50,000 years ago, originating from the southern route out of Africa. He places *Homo sapiens* one time departure from Africa across the Red Sea into modern day Yemen about 80,000 years ago during a period of glaciation when sea level was much lower, passing along a southern coastal route through South Asia (modern Pakistan/Arabian Gulf) with human occupation in China and Australia by 70,000 years ago, and into Central Asia (modern day Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan and Tajikistan) about 40-50,000 years ago

from the Indo-Pacific, via three different routes. Modern man is believed to have first entered Europe from South Asia about 50,000 years ago along the eastern side of the Arabian Gulf just west of the Zagros Mountain range of modern day Kurdistan [through portions of modern Iran/Iraq/Syria], skirting the Mediterranean Sea up through Turkey and then across the Bosphorus Straights. A second migration into Europe took place from South Asia via a Trans-Caucasus route, just west of the mountains and east of the Black Sea through modern day Iran, Turkey, Georgia, Russia and then west, and/or from Central Asia east of the Caspian Sea through Russia sometime after 33,000 years ago. There are strong genetic ties with Europe and the regions of the Caucasus Mountains between the Black and Caspian Seas, as well as with Central Asia. Modern man is projected to have arrived in Siberia about 39,000 years ago from Central Asia. Entry into the Americas is said to be controversial among various scientific disciplines both in time (11,500 to 50,000 years ago) and in the number of migrations, though the majority of founding Americans lines are believed to have occurred before the last glacial maximum between 22,000 and 30,000 years ago (Oppenheimer, 2003).

1.1.3 Evolution of Modern Agriculture in Africa

About 100,000 years ago, humans were able to kill moderately sized prey such as eland. By 50,000 years ago, man had developed the skills and weapons to take on even the largest prey, such as cape buffalo, elephant and rhinoceros. By 40,000 years ago, people living in northern Africa were developing stone points with tangs, which allowed for the attachment of wooden handles and the evolution from less effective all-wood to stone tipped spears (Flannery, 1997 *In: Griffiths & Robin, 1997*).

About 20,000 to 10,000 years ago (18,000-8,000 BC), Later Stone Age populations practiced hunting and gathering. Wild grasses and tubers were

harvested and grinding stones were used to make flour (Martin & O'Meara, 1995). From 10,000 to 6,000 years ago (BP) (8,000-4,000 BC) the Sahara Desert had a Mediterranean climate with relatively high rainfall, fairly large population settlements, lakes, rivers and ponds. A large wildlife population, rich fisheries and food collecting allowed some human populations to become sedentary (Martin & O'Meara, 1995). Smith (1992) suggests that during this wetter phase, from 10,000 to 8,000 years ago, hunters and fishermen (archeological findings of bone harpoons) were scattered from Mali to the Nile Valley in open grasslands, and around Central and Southern Saharan lakes (e.g., Lake Chad and the Araouane lakes north of Timbuktu) and the Nile River.

People in the Nile Valley were intensively exploiting cereals from 17,000 to 12,000 years ago (15,000-10,000 BC), with little evidence of domestication. Egyptians managed the reproduction of wild animals such as gazelles, hyenas, oryx and giraffe, but did not domesticate them (Martin & O'Meara, 1995). Large-scale village farming did not appear until 5,000 BC, when the Egyptians supplemented hunting and fishing with domestic species, including those from Southwest Asia such as wheat, barley and flax, as well as goats, sheep, cattle and pigs (Martin & O'Meara, 1995) (Table 1.1).

Rainfall and soils tended to determine vegetation cover, which in turn influenced lifestyles. In the low and erratic rainfall areas over much of Sub-Saharan Africa's savannas, which constitute 70-75% of the territory (see Chapter 5), mobility in the form of hunting and gathering, as well as pastoralism assured access to regular food supplies without over-harvesting and degrading the environment (see Chapter 2, Section 2.1.5, Mobility as a Means of Managing Natural Resources and Section 2.3.2, Pasture and Water). Human populations were small and the need for highly organized societies minimal. Societies tended to be egalitarian. Dyson-Hudson (1984 *In:* Smith, 1992) considers such groups as being "r-

strategists”³. Pastoralism changed man’s relationship from co-existing with nature to beginning to manipulate it so as to permit accumulation. The accumulation of livestock meant the end of egalitarian societies, resulting in a spectrum of hierarchies from “haves” to “have-nots”, becoming accentuated as humans lifestyles evolved into the final stages of sedentarization: agriculture (Smith, 1992).

With adequate rainfall and/or water (e.g., along floodplains) and soils that permitted agriculture and storage of grains, human populations became sedentary and population densities increased. Eventually empires and kingdoms evolved, classified by Dyson-Hudson (1984 *In:* Smith, 1992) as “*K-strategists*”. The change from gathering to food production allowed human populations to significantly increase and to shift from a nomadic to a settled life. Food surpluses allowed the development of non-food producing specialties ranging from war-making and statecraft to art (July, 1970).

Cotton, which is believed to have originated in Africa, was cultivated at least 5,000 years ago (3,000 BC) (July, 1970). Eventually, indigenous cultigens were developed, such as African yams and palm oil from the forest regions, as well as African rice, bulrush millet, finger millet and sorghum (Martin & O’Meara, 1995). The transhumant lifestyle of herdsmen in open grassland environments militated against a single locus for the domestication of plants and animals (Smith, 1992).

³ In this context, r-strategy is a situation in which large numbers of offspring are produced but few survive. This is in contrast to a more stable environment, where as humans get better control over food supplies a K-strategy develops with lower mortality rates, growing populations possibly decreased reproductive rates and a segment of society freed up from food production (e.g., artisans, soldiers). This facilitates the evolution of empires and kingdoms.

Table 1.1: Examples and origins of early domestic crops from around the ancient world

AREA	CEREALS AND OTHER GRASSES	PULSES	FIBER	ROOT CROPS	MELONS
Fertile Crescent (Turkey, Syria, Iran, Iraq, Jordan)	Emmer wheat (<i>Triticum dicoccoides</i>), Einkorn Wheat (<i>Triticum boeoticum</i>) Barley (<i>Hordeum spontaneum</i>)	Pea (<i>Pisum sativum</i>) Lentil (<i>Lens culinaris</i>) Chickpea (<i>Cicer arietinum</i>)	Flax (<i>Linum usitatissimum</i>)	- -	Muskmelon = Cantelope = Honeydew (<i>Cucumis melo</i>)
China	Foxtail Millet (<i>Setaria italica</i>) Broom Corn Millet (<i>Panicum miliaceum</i>) Rice (<i>Oryza sativa L.</i>)	Soybean (<i>Glycine max</i>) Adzuki Bean (<i>Vigna angularis</i>) Mung Bean (<i>Vigna radiata</i>)	Hemp (<i>Cannabis sativa</i>)	- -	[Muskmelon]
Mesoamerica	Corn/Maize (<i>Zea mays</i> ssp.)	Common Bean (<i>Phaseolus vulgaris</i>) Tepary Bean (<i>Phaseolus acutifolius</i>) Scarlet Runner Bean (<i>Phaseolus coccineus</i>)	Cotton (<i>Gossypium hirsutum</i>) Yucca (<i>Yucca spp.</i>) Agave = Sisal (<i>Agave rigidula var. sisalana</i>)	Jicama (<i>Pachyrhizus spp.</i>)	Squashes = Pumpkin (<i>Cucurbita pepo</i>) etc.
Andes, Amazonia	Quinoa (<i>Chenopodium quinoa</i>) [Corn]	Peanut (<i>Arachis hypogaea L.</i>) Lima Bean (<i>Phaseolus lunatus</i>)	Cotton (<i>Gossypium barbadense</i>)	Manioc = Cassava (<i>Manihot esculenta</i>) Sweet Potato (<i>Ipomoea batatas</i>) Potato (<i>Solanum tuberosum</i>) Oca (<i>Oxalis</i> <i>tuberosa</i>)	Squashes (<i>Cucurbita maxima</i>), etc.
West Africa and Sahel	Sorghum (<i>Sorghum bicolor L.</i>) Pearl Millet (<i>Pennisetum glaucum (L.) R. Br.</i>) African Rice (<i>Oryza glaberrima</i>)	Cowpea (<i>Vigna unguiculata</i>) Groundnut (<i>Voandzeia subterranea</i>)	Cotton (<i>Gossypium herbaceum</i>)	African Yam (<i>Dioscorea rotundata</i> and <i>D. cayensis</i>)	Watermelon (<i>Citrullus spp.</i>) Bottle Gourd (<i>Lagenaria siceraria</i>)

Table 1.1 (Cont.): Examples and origins of early domestic crops from around the ancient world

AREA	CEREALS AND OTHER GRASSES	PULSES	FIBER	ROOT CROPS	MELONS
India	[Wheat, Barley, Rice, Sorghum Millets]	Hyacinth Bean (<i>Lablab purpureus</i>) Black Gram (<i>Vigna mungo</i>) Green Gram (<i>Vigna radiata L.</i>)	Cotton (<i>Gossypium arboreum</i>) Flax (<i>Linum usitatissimum</i>)	- -	Cucumber (<i>Cucumis sativus</i>)
Ethiopia	Teff (<i>Eragrostis tef</i>) Finger Millet (<i>Eleusine coracana</i>) [Wheat, Barley]	[Pea, Lentil]	[Flax]	- -	- -
Eastern United States	Maygrass (<i>Phalaris caroliniana</i>) Little Barley (<i>Hordeum pusillum</i>) Knot Weed (<i>Polygonum fagopyrum</i> or <i>Fagopyrum esculentum</i>) Goosefoot (<i>Chenopodium bushianum</i> ssp. <i>jonesianum</i> and <i>C. berlandieri</i>)	- - - -	- - - -	Jerusalem Artichoke (<i>Helianthus tuberosus</i>)	Squash = Pumpkin (<i>Cucurbita pepo</i>)
New Guinea	Sugar Cane <i>Saccharum officinarum</i>	-	-	Yams (<i>Dioscorea alata</i>) Taro/Cocoyam (<i>Colocasia esculenta</i>)	-

Source: Extracted From Diamond (1997) with permission W.W. Norton and Company & Vintage Randomhouse. Note: [] = First domesticated elsewhere

Chrétien (2003) places the appearance of agriculture in the Sahel as about 4,000 years ago (2nd millennium BC) occurring conjointly with the drying of the Sahara area, forest retraction and a human ebb towards a more favorable zone. Chrétien (2003) places the development of sorghum, a cultivar, which complimented garden and root crops, at about 3,000 years ago (1,000 BC) between the Nile and Chad. The local cultigens mentioned above replaced imported winter wheat and barley in the Sahel and further south (Martin & O'Meara, 1995). Sedentarization

intensified during the first millennium BC through the combined action of collectors, fishermen, cattle raisers, cultivators of long-fallow fields and blacksmiths (implying iron technology in West/Central Africa), (Chrétien, 2003).

Bananas (Martin & O'Meara, 1995; Chrétien, 2003), coconuts (Martin & O'Meara, 1995), and the root crop taro (Chrétien, 2003) came from South Asia, while corn and manioc originated from the New World (Table 1.1). Vande weghe (2004) believes that the banana entered Africa more than once, but for the first time about 2,500 years ago (500 BC), mainly *Musa acuminata* originating from India, Indonesia and Southeast Asia, and *Musa balbisiana* originating from India, Burma and the Philippines. By 1,000 BC bulrush millet, finger millet and sorghum were making their way to Asia (Martin & O'Meara, 1995). Giles-Vernick (2002) estimates that maize (corn) reached Africa from the New World sometime after 1,500 AD.

1.1.4 Origins of Domestic Livestock and Pastoralism in Africa

By 9,000 years ago (7,000 BC), the inhabitants of what is today the Egyptian Western Desert were living around ponds and domesticating barley and cattle, well before development in the Nile Valley had taken place. Egypt appears to have domesticated the cat, donkey and wild cattle, cattle not being indigenous to Sub-Saharan Africa. About this time, Asian sheep and goats were also imported (Martin & O'Meara, 1995).

Between 8,000 and 7,000 years ago (6,000 and 5,000 BC), domestic sheep and goats, and pottery making were rapidly adopted across coastal North Africa, replacing hunting as a way of life (Martin & O'Meara, 1995).

Archeological sites further west in the Sahara show remains of sheep, goats and domestic cattle, grinding stones and possible domestication of grasses between 7,000 and 6,000 years ago (5,000 and 4,000 BC) (Martin & O'Meara, 1995). It is believed that all domestic goats and sheep (caprines) in Africa are derived from an exotic progenitor probably originating in the Near East and introduced via North Africa (Libya) and/or Egypt 7,000 to 6,800 years ago (5,000 and 4,800 BC) (Smith, 1992). Vande weghe (2004) suggests that all domestic ungulates of Africa originate from Asian species first domesticated in Asia:

- Goats came from the Ibex, *Capra aegagrus* in the mountains of southwestern Asia;
- Sheep descended from the Arkhar or Argali sheep, *Ovis ammon* of Central Asia, the Urial sheep, *Ovis vignei* from south-western Asia and the European Mouflon, *Ovis musimon* of Asia Minor and Europe.

The origins of domestic cattle are still questioned (Smith, 1992). The theory surrounding this question is that:

- They were introduced from Near East to North Africa and Egypt;
- One or two wild forms of *Bos spp.*, which were indigenous to North Africa during the Pleistocene Epoch, are believed to be the wild progenitors to domestic cattle in Africa. The idea of their domestication possibly coming from introduced caprines;
- They were introduced by a link between Italy and the Maghreb (North Africa) via Sicily 10,000 to 7,000 years ago (8,000 and 5,000 BC).

Baker and Manwell (1980 *In:* Smith, 1992) through genetic studies classified African cattle into the following:

- Category VI: African humpless including the N'Dama and West African Shorthorn;
- Category VIIa: African humped (Zebu mixture);
- Category VIIb: African humped including the Sanga, Africander, Nguni, Ovambo, Pedi.

The stem of this phylogenetic tree is the Near East, but genetic material of the wild cattle, *Bos primigenius*, of the Near East was probably close to the indigenous North African wild stock that existed. This means that the Sanga group could easily have been derived from an admixture of the domestic humpless *Bos. spp.* coming from the North African *Bos primigenius*, and early *B. indicus* (humped short-horned Zebu) entering Africa via Asia. Protein analyses suggest that the African humpless varieties are closest to the European *B. taurus* (humpless, long-horned) and may represent a direct descent from the primigenius type, while blood groupings place the long horned N'Dama (*B. taurus longifrons*) and West African Shorthorns (*B. taurus brachyceros*) (Rege, Aboagye, & Tawah, 1994) between the *B. indicus* (Zebu) and *B. taurus* (Smith, 1992). Vande weghe (2004) states the ancestral species of African cattle are the Aurochs, *Bos primigenius*, a long-horned bovine from Europe, Asia and North Africa, and the Uru, *Bos namadicus*, from India and perhaps the tropical regions of Asia. Attempts by Egyptians at domesticating antelopes failed (Vande weghe, 2004). Poland, Hammond-Tooke and Voight (2003) suggest that both *B. taurus* and *B. indicus* derive from the extinct wild ox of Europe, *B. taurus primigenius*. They believe that while *B. indicus* was domesticated in the Near East about 7,000 years ago (5,000 BC) in the Indus Valley and introduced to Africa via the Horn or East Africa, *B. taurus* was domesticated in Africa (Egypt and/or the Nigeria/Cameroun region of West Africa. The authors furthermore suggest that all African cattle stem from *B. taurus* with a significant to dominating influence by *B. indicus*. The

widely used “*Sanga*” refers to the wide-horned Zebu strain of cattle, with or without a hump, found from Ethiopia to South Africa.

Times given for the drying out of the Sahara vary. Smith (1992) believes this phenomenon occurred sometime after 8,000 years ago (6,000 BC) resulting in hunters and fishermen abandoning much of the area, leaving behind an open ecological niche resulting in spread of pastoralism – that is colonization of an uninhabited grassland niche. Martin and O’Meara (1995) place the timing of this gradual desiccation of the Sahara pushing people south and west into wetter regions at about 6,000 years ago (4,000 BC).

Smith (1992) argues that movement into the Sahel, as dryer conditions pushed the tsetse fly belt back, took place about 4,000 to 3,300 years ago (2,000 to 1,300 BC) permitting the southward movement of cattle. Martin and O’Meara place the spread of domestic cattle south of the Sahara at about 6,000 to 5,000 ago (4,000 to 3,000 BC), supplemented by subsistence hunting and fishing. This also resulted in the development of the N’Dama and West African Shorthorn cattle derived from early domesticated Saharan cattle. They eventually developed blood group selections, becoming trypanotolerant⁴ to sleeping sickness (Smith, 1992). Many believe the N’Dama evolved in the Fouta Djallon Mountains of Guinea-Conakry,⁵ and later spreading throughout the Sudanian and Guinean climatic regions (FAO, 1987 *In: OSU*, 2000).

Between 4,000 and 3,000 years ago (2,000 and 1,000 BC), herding became established in southern Kenya and Tanzania. Further spread of herding and

⁴ Trypanotolerant animals are resistant to the trypanosomiasis causing sleeping sickness

⁵ The Fulani communities in the Fouta Djallon Mountains of Guinea became sedentary and more agro-pastoralists than pastoralists. See definitions in Section 1.6.1, Southward Expansion Of Pastoralism And Livestock Into East And Southern Africa

agriculture south of Tanzania was blocked for about 2,000 years, some say due to the extremely successful hunter-gatherer adaptation of the Khoisan-speaking people of southern Africa (Martin & O'Meara, 1995) (see Section 1.6.1, Southward Expansion of Pastoralism and Livestock into East and Southern Africa).

1.1.5 Development of Modern Societies with an Agricultural Base

The last few millennia BC saw many societies based on agriculture rapidly develop in Africa and Eurasia (Martin & O'Meara, 1995). July (1970) places the beginning of the Bantu migration spreading agriculture southward, at the time of Christ (0 AD/CE) or about 2,000 years ago (see Section 1.7, BANTU AFRICA).

Diamond (1997) and Thomson (2003) believe plant geography had a major influence on the movements of people and settling of the African Continent. Both Diamond (1997) and Chrétien (2003) show how the Bantu development of sophisticated sedentary agriculture freed up a portion of the society to become involved in non-food producing activities such as the military, commercial and artisanal fields. This development enabled the evolution of clan driven societies into territorial expanding kingdoms and monarchies. Summer-rainfall crops, all coming from north of the equator, permitted the development of surplus food that could support armies. Vande weghe (2004) also believes that crops from the Americas (see Table 1.1) played a major role in increasing food production and allowing populations to grow. From 1550 AD, the Portuguese played a major role in the introduction of these foods. South of the equator, groups like the Pygmies and Bushmen remained hunters and gatherers without such cultivars.

The Xhosa made up the most advanced southern movement of Bantu coming out of Central Africa: They were well established near the bottom of South Africa by

the 18th century AD, but were forced to stop at the Fish River, Eastern Cape Province, because they had only summer-rainfall crops (e.g., sorghum, millet and yams from Central/West Africa and bananas from Asia, among others) (Diamond, 1997; Thomson, 2003). The deserts of the Karoo and Namib did not allow the introduction of traditional agriculture, eventually becoming a safe haven for the Bushmen hunter-gatherers. The Afrikaners (Boers), descendants of Dutch/Huguenot immigrants, who arrived in Capetown, South Africa from 1652 AD, brought with them Mediterranean winter rainfall crops such as wheat and barley, adapted to the temperate climate area (Diamond, 1997; Thomson, 2003).

1.1.6 Arrival of Iron Technology in Africa

Iron smelting technology spread rapidly throughout the Near East, Mediterranean, Europe, entering North Africa through Phoenician traders by 2,800 years ago (eighth century BC) and West Africa by 2,300 and 2,400 (third to fourth centuries BC). Smith (1992) indicates that copper smelting was established in the Sahel between 4,100 and 3,600 years ago (2,100 and 1,600 BC), while iron working was well established in Niger by 2,500 years ago (500 BC). Diamond (1997) places the arrival of iron smelting in Sub-Saharan Africa at 1,000 BC, very close to the dates for arrival of Near Eastern techniques in Carthage on the North African Coast. July (1970) places Africa's first indigenous iron industry at around 2,600 years ago (600 BC) with the Kingdom of Kush on the Nile River, centered 242 km (150 mi.) north of what is now Khartoum. By 2,600 years ago (sixth century BC), iron technology associated with a pottery called *Urewe Ware* was found in the inter-lacustrine area of East Africa possibly coming up the Nile from the iron-making center in Meroe of the Kingdom of Kush (Martin & O'Meara, 1995). Schmidt (1974 *In: Kjekshus*, 1977) indicates that iron works dating back to 2,500 years ago (500 BC) were found in the West Lakes Region (Bukoba/Karagwe) of Tanzania. Nilotic speakers are believed to have brought iron technology into the

highlands of East Africa during the first millennium AD (Martin & O'Meara, 1995). By the fourth century AD, a full-scale Iron-Age culture existed between the Zambezi and Limpopo Rivers (July, 1970).

This technology moved rapidly southward with the Bantu migrations out of western Cameroon and eastern Nigeria, which will be described below (July, 1970). Vande weghe (2004) places the appearance of iron smelting in Niger at around 3,000 years ago (1,000 BC), in the Great Lakes Region about 2,600 to 2,500 years (600 to 500 BC) ago, in Gabon's Ogooué Valley at around 2,400 to 2,300 years ago (400 to 300 BC) and in Gabon's estuarine area by 1,900 years ago (2nd century AD). He also states that this technology arrived in the lower Congo by the second century AD, in the Batéké Plateau (near modern-day Kinshasa, DRC) by the third century AD, in the woodlands of Katanga (today's DRC) between second to fourth century AD and in the Transvaal (today's Gauteng, Limpopo, Mpumalanga and Northwest Provinces, South Africa) by the 13th century AD (Based upon estimates for arrival of the Bantu in South Africa, 14th century AD might be more accurate). On the other hand Diamond (1997) argues that copper smelting had been going on in the West African Sahara and Sahel since 4,000 years ago (2,000 BC), and that this technology may in fact have developed independent of its introduction from the Mediterranean given the fact that the blacksmithing techniques were significantly different between the two areas. July (1970) supports the theory believing that iron making developed on its own in West Africa independent of that in the Nile Basin, or was possibly introduced around 2,300 years ago (300 BC).

1.2 MAN THE HUNTER

It is humans' evolution into hunters, super predators, which is believed to have had much to do with the development of who we are and set us apart from all

other animals. Humans are the only primates who became dependent on meat for survival (Ardry, 1976). Hunting impacted on humans psychologically, socially and territorially (Ardry, 1966). This included them developing a much increased intelligence with a long-developing brain that did not reach its full capacity until the age of 23 years compared to chimpanzees, whose brain growth is completed at 12 months after birth. Furthermore, humans developed the ability to run on their feet without the use of their hands, freeing the latter for other activities such as the use of weapons. A longer childhood enabled them to learn at a much higher level than any animal before. Cooperative hunting required the development of speech and facial expressions to improve communication (Morris, 1971). Being small and vulnerable, men with their primitive tools hunted large meat-rendering but dangerous game in bands to increase the likelihood of success, “winning” in modern-day terms, while fending off other predators that saw them as a meal (Ardry, 1966). Because, the young took so long to develop, man the hunter had to develop a home base and range (territory), much different than the primates before him. Labor became sexually divided, with the women caring for the young and the hearth, while man the hunter ranged widely in all male parties in search of food (Morris, 1971; Ardry, 1976). This eventually resulted in humans developing territories in which they lived, while controlling access to natural resources within the territory necessary for the band’s/clan’s survival (Ardry, 1966; 1976). Adult human males, differed from their vegetarian primate brothers in learning to share food, which might be considered normal carnivore behavior (Ardry, 1966). The “cultural acquisition” of sharing enabled humans to survive the open savannas.⁶

⁶ As opposed to humans, the chimpanzees are known to periodically hunt in bands, more for fun than for food. Unlike man the spoils go to the individual making the kill, not to the group. The savanna baboon hunts only seasonally when gazelle fawns are dropped (Ardry, 1976). Ardry (1976) hypothesized that the practice of hunting by chimpanzees is a relic of the past that is no longer needed in a forest environment where they are currently found. This dates back to the time when humans and chimpanzees had a common ancestor that developed in a savanna environment. Later, humans moved out onto the plains to become primarily meat eaters, while chimpanzees returned to the forest and remained omnivores thriving primarily on fruit, shoots, buds, a few leaves, insects and birds’ eggs.

Through never completely perfected, another aspect of human evolution was the forming of long-term relationships. The prolonged period of adolescence also resulted in a major change in primate socio-sexual behavior through the development of pair-bonding, in which men and women fell in love and remained faithful to each other even when separated for extended periods of time. The woman was sure of the man's support devoting herself to maternal duties, while men could devote time to hunting without the need to fight over females. The young received maximum care and attention (Morris, 1971).

Mutual cooperation, the *noyau* (nucleus) resulted in primitive evolutionary steps towards a society that was characterized by mutual aid and interdependence of the group. This eventually also extended to the biological nation in defense of a social territory. Primitive hunting bands merged into clans with combined territories, then into tribes, confederations and finally modern nation states, in which a single unified territory commanded allegiance, sacrifice and amity of all social partners (Ardry, 1966)

In modern, Western, urbanized man, this instinctual urge to hunt has not been eliminated, even when there is no economic or survival incentive. Big game hunting, fox-hunting, coursing, falconry, bird shooting, fishing and hunting-play among children are contemporary manifestations of the hunting urge. With the advent of the computer, some of the hottest selling software games among adults and children have been simulated hunting games. It is not just about killing, but also about the chase, being “*sporting*” and giving the animal a fair chance to escape. The hunt is a gamble (Morris, 1971), a risk of coming home empty handed, being killed or claiming victory through the taking of prey. In modern-days, this victory is relieved by hanging the artful taxidermy trophy on the wall. Morris (1971) believes that the urge to hunt and gamble is strongest in the lower and upper classes. The middleclass overcomes the hunting urge through their

work, by getting a new customer, making a “*killing*” on a big sale or winning a court case. The lower classes’ work, on the other hand, is boring and routine with limited challenges that cannot replace the uncertainty and thrill of the hunt. In terms of the idle rich, who have been born into or have achieved economic independence, hunting becomes for many their major challenge in life, a demonstration of their manliness and success among their peers. Then there are those, rich, poor and middleclass who are born with a strong hunting urge, a flame that cannot be extinguished. As opposed to hunting for the thrill of it, in many places in rural Africa today, where people are closely tied to living off the natural resource base as a means of survival, there is no sense of “fair chase”, or “sport”, only of survival. One might compare this to the attitudes of American pioneers or Boer trekkers, where wildlife served as a tool of conquest and survival. The conflict between Western “sport hunters” and “traditional hunters” in their identification with wildlife will be brought out more in Chapter 3.

Thus, emerging out of the Pliocene Epoch, for at least 2.5 million years (3 million years in Leakey, Hay, Curtis, Drake, Kakes & White, 1976 *In:* Blankenship, Parker & Ovortrup, 1990), *Homo habilis*, man the hunter honed his skills and developed into a social being. It is not until about 5-10,000 years ago that humans began entering into agriculture as an alternative to hunting, and even then, hunting was a supplement to that which is grown on the land and/or taken from domesticated livestock. Hunting both as a means of survival and as an urge that must be fulfilled is still a strong part of man and his character as we enter into the 21st century AD

Until the middle of the 19th century AD, for a variety of reasons, which will be highlighted, Africans lived from and managed their natural resources (see Chapter 2). Wildlife and the access to other natural resources were tied to their religion, ancestor worship, territory and ultimately to their survival. Today, Africa’s

human populations appear out of balance with their natural systems and in many cases out of touch with these resources – alienated from them, seemingly mining them for short-term gains. What lies behind this? Why is Sub-Saharan Africa where it is today? Why has man the hunter become man the poacher in Africa and what, if anything, can the subcontinent do to address these issues? Forthcoming chapters look into these issues but in order to address them effectively, it must be remembered that modern man is as much a hunter in the 21st century AD as he was 12,000 years ago; some hunt for sport, others for survival and cultural reasons, and others “hunt successfully” on the stock market. Ultimately, man the hunter is here to stay and will not disappear.

The question that must be asked is “Will Sub-Saharan Africa’s mega-fauna be able to survive man in the 21st century AD? Is the primeval urge of the strong overpowering the weak make sense in the 21st century AD when we have become a global society, especially when nations take on this predatory behavior in their quest to control access over resources”? Do there always have to be winners and losers as in the past, where man the hunter or conquering state dominated others, where rich people and powerful countries took advantage of the others? What are the threats to the rich when the poor of the world, with the aid of modern communication, understand more than ever this exploitation, and more than ever appear to be resisting? Can man the hunter’s character allow win-win relationships for everyone just as in the past when he shared meat from the kill? Can humankind behave as a “Global Village”, where poverty can be significantly reduced? If not, what does this imply for Sub-Saharan Africa, its people, and “their” wildlife that the West seems to value so much? Just as importantly, what does this imply for Western civilization as we know it today? While Africa and other developing regions were in the past safely separated by the chasm of oceans, their future and ability to modernize may very well determine not only their

survival but also that of the Western World. These issues are discussed throughout the book.

1.3 CO-EVOLUTION OF HUMANS AND WILDLIFE IN SUB-SAHARAN AFRICA

“Co-evolution is defined as reciprocal selective pressures that operate to make the evolution of one taxon partially dependent on the evolution of another. This process often involves multiple species exploiting shared limiting resources. In classic co-evolutionary models, populations of sympatric species are seen to diverge in one or more morphological, ecological, or behavioral traits to effect more even partitioning of resources and reduce levels of interspecific competition. Character displacement and resource partitioning are thought to be central not only to how species coexist on limited resources, but also to how species invade new resource niches. Hominid invasion of the predatory guild would have brought them into contact with a range of new selective pressures including competition with a number of large-bodied predators” (Brantingham, 1998).

1.3.1 Co-Evolution of Man and Wildlife in Sub-Saharan Africa

A major difference between wildlife in Africa and all other continents is believed to be that wildlife in Africa co-evolved and thrived with man until recent times (the last 200-300 years).

“Archaeological and other studies have shown long-term and widespread associations between hominids and other large-bodied predators in past ecological communities. Throughout hominid evolution there appears to have been a consistent overlap both in the use of space and foraging strategies employed by hominids and large-bodied predators. Such hominid-carnivore associations are apparent in Plio-Pleistocene East and Southern Africa. Hominid-carnivore co-evolution may have been integral to the evolution of a variety of unique human traits such as lithic (man’s use of stone as a cultural tool), large brains, and complex social and foraging group organization” (Brantingham, 1998).

1.3.2 Man and the Extinction of Pleistocene Mega-fauna

“The demise of the Pleistocene mega-fauna (about 10,000 years ago) has perplexed scientists for many years. Climatic change during the last major deglaciation period, which would have caused environmental stress for the ‘ice age’ fauna, has commonly been advanced as the driving force behind the Pleistocene extinctions (Martin, 1986 & Grayson, 1987; 1991 all *In:* Burkhardt, 1995). However, certain features of the extinction are not well explained by the climatic theory. Differential timing of the extinction between continents and the apparent lack of effects on small fauna and flora are difficult to explain under the climatic theory. Equally troublesome are some of the most recent interpretations of past climatic fluctuations which suggest that the Pleistocene mega-fauna survived several early periods of glacial and interglacial climatic pulses, which were more severe than that of 10,000 years ago” (Grayson, 1991 *In:* Burkhardt, 1995).

Similar arguments are made by Leakey and Lewin (1995), who present several possibilities for Pleistocene extinctions and conclude that a number of factors may have caused them, with humans certainly being a primary “agent of extinction”. This leaves the subject open for more debate.

It is now believed that by the time humans arrived in North America and Asia at the end of the Pleistocene, some 12,000 years ago, wildlife had already evolved considerably. The fossil record indicates that for several million years, as in Africa, the North American continent supported a wealth of large ungulates, which only recently, 10,500-7,000 years ago, disappeared. There is increased evidence that these Pleistocene extinctions in North America (Burkhardt, 1995), Asia, the Pacific and Madagascar are not adequately explained by climatic shifts (e.g., the Ice Age).

“Just as the fossil record reveals the co-evolution of the Pleistocene flora and fauna and the existence of these widespread natural herbivores on each continent, the fossils also record the demise of

the mega-fauna” (Flehardt & Hulett, 1977; Martin, 1986; Owen-Smith, 1987; Grayson, 1991 all *In: Burkhardt, 1995*).

Historically, there have been five global species extinction events in the history of the earth, the last being 65 million years ago, marking the end of the dinosaur (Leakey and Lewin, 1995):

1. End of Ordovician, 440 million years ago;
2. Late Devonian, 365 million years ago;
3. End of Permian, 225 million years ago;
4. End of Triassic, 210 million years ago; and
5. End of Cretaceous, 65 million years ago.

One characteristic common to each of these events is a fall in sea level or marine regression, which could have occurred for any number of reasons, including polar glaciation. One theory has it that the exposure of organic mud previously buried on the sea floor resulted in massive oxidation and a drop in atmospheric oxygen levels by half of what they are today, which in turn impacted on terrestrial vertebrates. However, marine regression is not always associated with mass extinctions, implying that other factors must also have come into play. For instance, at the end of the Permian, there was a sudden rise in the sea level, resulting in low oxygenated water; the mass extinctions on land and in the sea at the time are hypothesized to be from suffocation. At the end of the Cretaceous, dust from an asteroid colliding with the earth, possibly in the Yucatan Peninsula of Mexico, could have been responsible for the permanent darkness that reigned, devastating plant life on land and in the sea, as well as associated animal life dependent on plants for food and possibly oxygen. Some say that this served as a *coup de grace*, along with marine regression, to the already outlived dinosaurs (140 million years of domination) and marine ammonoids (nautilus-like shelled invertebrates that had existed for 330 million years). The extinction of the

dinosaur resulted in mammals becoming the dominant land vertebrate. Some hypothesize that extinction bursts, including the “Big 5 Extinctions” occurred at intervals of about 26 million years and that they can all be tied to extraterrestrial bombardment by asteroids and comets (Leakey & Lewin, 1995).

The world is now considered to be in the sixth event, with three major waves of extinction having been identified (Wilson, 1992 *In:* Anderson, 2001). More recently, the theory that the Pleistocene extinctions were primarily driven by human predation has been gaining scientific proponents (Fleharty & Hulett, 1977; Denevan, 1992; Martin, 1970; 1986; 1990; Diamond, 1992; Wilson, 1992; Alcock, 1993; Burney, 1993; Owen-Smith, 1987 all *In:* Burkhardt, 1995). Only on the continent of Africa did the co-evolution of man and the mega-fauna over millions of years provide wildlife “time to learn a healthy fear of man and with it a healthy avoidance of hunters” (Diamond, 2005).

This new predator, man the hunter, populated the new lands and began to dramatically affect the mega-fauna. An interesting aspect of this extinction theory is that the chronology of Pleistocene extinctions on each of the world continents and major islands occurred shortly after the arrival of humans (Martin, 1990; Steadman, 1995 all *In:* Burkhardt, 1995):

- The first wave of extinction took place when humans moved out of Africa on foot and into Europe and Asia from 100,000 – 30,000 years ago. The quantification of species extinction is still to be measured.
- The second wave of extinction occurred when humans moved out of Asia into North and South America by foot, as well as to the Pacific, Australasia and Madagascar by raft from 30,000 to 1,000 years ago.
- The third, and most contemporary, wave of extinction was caused by colonists exiting an over-crowded Europe on sailing ships about 1500 –

1840 AD and again by rail, steamship, motorcar and plane from 1840 – 2000 AD in search of a better life. This has resulted in the wholesale removal and/or modification of habitat, continuing today and compounded by the global population explosion. In the case of Africa it is also linked to poverty, subsistence lifestyles and centralization of land/resource tenure that are discussed in this book.

1.3.3 North America

The Paleo-Indians (Clovis people) arrived at the end of the Pleistocene retreat of continental ice sheets when they crossed the Bering Strait into Alaska, reaching the Gulf of Mexico 11,150 years ago and South America 10,500 years ago. In 1,000 years, the population exploded to several million people. The mega-fauna were far more diverse than that of contemporary Africa, but by about 10,500 years, many species had been hunted to total extinction (Wilson, 1992; Burkhardt, 1995; Leakey & Lewin, 1995 all *In:* Anderson, 2001).

In western North America, the radiocarbon dates of most common genera found in the fossil record indicate that the majority of large herbivores and their associated predators became extinct between 12,000 and 10,000 years ago. This massive extinction over an extremely short period of time removed 70-73% of the Pleistocene mega-fauna in North America (Wilson, 1992; Leakey & Lewin, 1995 both *In:* Anderson, 2001; Martin, 1986 *In:* Burkhardt, 1995).

North America lost 33 of 45 genera of large mammals during this late Pleistocene extinction (Martin, 1986; 1990 *In:* Burkhardt, 1995), some sources estimating extinction at 57 large mammal species (Wilson, 1992 *In:* Anderson, 2001; Leakey & Lewin, 1995). This included the proboscides: early elephant and mastodons and wooly mammoths. Other species that became extinct were glyptodonts/armadillos,

giant sloths, horses, camels, saber-tooth tigers, lions and giant bears (Wilson, 1992; Leakey & Lewin, 1995 both *In:* Anderson, 2001). It is noteworthy that very few small mammals became extinct in North or South America (Wilson, 1992 *In:* Anderson, 2001; Burkhardt, 1995; Leakey & Lewin, 1995). This implies that small mammals had little value to man as a source of food, clothing, shelter or utensils.

From 7,000 years ago to the present, the poor remnants of the Pleistocene mega-fauna have and still include the bison, elk, moose, deer, pronghorn, and bighorn sheep and mountain goats. The extinction by 10,000 years ago of most large herbivores and predators left the natural rangeland-grazing ecosystem, which had existed for several million years, with many vacant niches for large herbivores. To date, neither evolutionary substitution (for which there has been far too little time) nor immigration has filled the empty niches in this natural herbivory (Martin, 1970 *In:* Burkhardt, 1995). Leakey and Lewin (1995) argue that many species of the American mega-fauna that did survive were themselves immigrants across the same land bridge from Asia and had co-evolved with humans for several million years, acquiring wariness and instincts to avoid man the hunter. Others such as the caribou, bison and antelope were unpredictable in their movements, while the moose, spectacled bear and tapir lived in heavy cover, which made detection more difficult. These were only a few of the large mammal species, which existed before the Pleistocene extinctions took place and managed to survive.

“The unrecognized implications of the Pleistocene extinctions on current efforts to comprehend our western ecosystems are tremendous. Underlying nearly all aspects of land management is the assumption that the fauna and flora of North America at the time of European contact was in a pristine natural state of balance. Largely unaware of the fossil record, many ecologists, range scientists, land managers and environmentalists have assumed that this so called pristine balance was the end product of millions of years of co-evolution of plants and animals. The concepts of

climax pristine and natural have pervaded all facets of land management and ecology in the U.S.

When the system is in balance, i.e. all the available niches occupied, extinctions and evolution of new forms occur somewhat equally. The late Pleistocene extinction far exceeded replacement and it affected only the larger fauna...Immigration or ecological substitution has not yet replaced what was lost. This hardly appears to have been a common evolutionary event" (Burkhardt, 1995).

Eventually, the relationship between the American Indians reached a balance and resulted in their co-existing with the remaining wildlife until the arrival of the Europeans.

The bison was one of the few really large herbivores to survive the Pleistocene extinctions and vast herds of these animals roamed the American prairies at the time of first European contact (Roe, 1970 *In:* Burkhardt, 1995). It is ironic that within slightly less than 400 years after Columbus landed in the western hemisphere, Europeans all but hunted the North American bison to extinction (Burkhardt, 1995). In less than 300 years, the American pioneers extirpated much of North America's remaining wildlife (see Chapter 3), which resulted in the imposition of conservation laws similar to those in Africa. As will be discussed in Chapter 3, in both North America and Africa, it was the European and not the indigenous people who hunted wildlife to extinction and/or near extinction.

1.3.4 Rest of the World

Extinctions, attributed to human beings and their invasion, occurred on other continents (Wilson, 1992; Leakey & Lewin, 1995 both *In:* Anderson (2001)):

- Australia lost 86% of its mega-fauna 30,000 years ago with the extinction of 50 species and only 4 species surviving, all kangaroos.

- New Zealand, 1,000 years ago, lost 100% of the mega-fauna and 50% of all birds, including all large and flightless species.
- South America lost 80% of its mammal genera 10,500 years ago and a similar percentage of its largest birds.
- Pacific Islands lost more than 50% of their terrestrial bird species between 3,000 and 1,500 years ago.
- Madagascar was invaded 1,500 years ago, which resulted in the total extinction of mega-fauna within centuries – all endemic species, seven of 17 genera of lemurs, all six to 12 species of elephant bird, pygmy hippo, an aardvark and two huge land tortoises.

Leakey and Lewin (1995) believe that habitat loss resulting from deforestation and the introduction of the rat, both of which are tied to the invasion of the island by humans (the Maoris), as well as hunting, contributed to the extinction of species in New Zealand.

1.3.5 Africa's Mega-fauna and the Arrival of Europeans

This is discussed in more detail in Chapter 3. In Africa, whereas indigenous human occupation through co-evolution had only touched lightly on and had not greatly disturbed relationships within the community of plants and animals, the European arrival, beginning in the 1500s AD, brought decimation in its wake. In South Africa, this resulted in the extinction of a number species, including the bluebuck or blaauwbok (*Hippotragus leucophaeus*) and the quagga (*Equus quagga quagga*), or virtual elimination of the bontebok (*Damaliscus p. pygarus*), the blesbok (*Damaliscus p. albifrons*), the black wildebeest (white-tailed gnu) (*Connochaetes gnou*), Cape Mountain Zebra (*Equus zebra*) and the elephant (*Loxodonta africana*).

Africa's human population explosion of the 21st century AD might be considered a fourth “*Wave of Extinction*” in which the significant reduction in wars and disease because of European colonization has resulted in a level of human pressure on Africa's wildlife never seen before. This has indirectly been due to the destruction of habitat and directly to species extinction/reduction. Stemming the wave of habitat destruction in the 21st century AD, by addressing resource/land tenure and by alleviating human population pressures on Africa's natural systems, will be key to the future survival of the subcontinent's mega-fauna and even human society. Richard Leakey leaves little doubt about his concern for the impacts of modern man on natural systems and the extinction of species in the 21st century AD, “I believe we face a crisis – one of our own making – and if we fail to negotiate it with vision, we will lay a curse of unimaginable magnitude on future generations” (Richard Leakey In: Leaky & Lewin, 1995). Today's Africans, the majority living subsistence lifestyles, can be considered as being out of balance with nature. This argument is a recurring theme throughout the book, as well as the presentation of possible “Ways Forward” in the final chapter.

1.4 WEST AFRICAN KINGDOMS AND EMPIRES

“...there was no interruption of African history. It is evident that, if starting from Nubia and Egypt, we had followed a continental geographical direction, such as Nubia-Gulf of Benin, Nubia-Congo, Nubia-Mozambique, the course of African history would still have appeared uninterrupted. This is the perspective in which the African past should be viewed...Egyptology will stand on solid ground only when it unequivocally officially recognizes its Negro-African foundation” Cheikh Anta Diop (1974).

The well-known Senegalese historian, physicist and philosopher, Diop (1974) provides substantial but controversial evidence that early civilization as known to humankind began in what is now Lower Egypt/Ethiopia/Sudan. Diop (1974) believes this civilization to have been black in origin, gradually interbreeding with

other races, especially whites as the region was invaded by outsiders.⁷ This black civilization is believed to have made major contributions to the arts, religions, agriculture, social organization, medicine, writing and architecture gradually spreading to Europe and Asia. Diop (1974) also traces many West and Central African ethnicities such as the Wolof, Serer, Fulani/Peul, Toucouleur, Fang, Yoruba and Bamum, as originating from the Nile Basin. This is based on morphological, biochemical (e.g., melanin), linguistic, cultural (e.g., matriarchal aspects of societies, kings, circumcision), historical (e.g., Greek and European historians, logs of early European navigators/explorers, Arab and Egyptian translations, Biblical and Koranic writings), archeological, architectural, artistic and religious (e.g., similar gods, totems, ancestor worship) information and ties. Similarly, Schmidt (1998) places the origin of the Bangando, today living in the forests of Southeastern Cameroon, as Sudan in the region of the Nile. The ancient empires of Ghana, Mali, Gao, Yatenga/Mossi and the kingdoms of Djolof and Cayor (both in Senegal) can be traced back to having Egypto⁸-Nubian⁹ roots (Diop, 1974). Diop (1974) hypothesizes that the harshness of the European climate gave Europe superiority over Africa, since this encouraged conquest, accumulation (materialism) and continued technical progress as survival mechanisms. This superiority and the need for slaves to fuel the economies of the New World resulted in a falsification of African history and the black personality that was depicted as half-animal, “a piece of merchandise” (Diop, 1974). Though

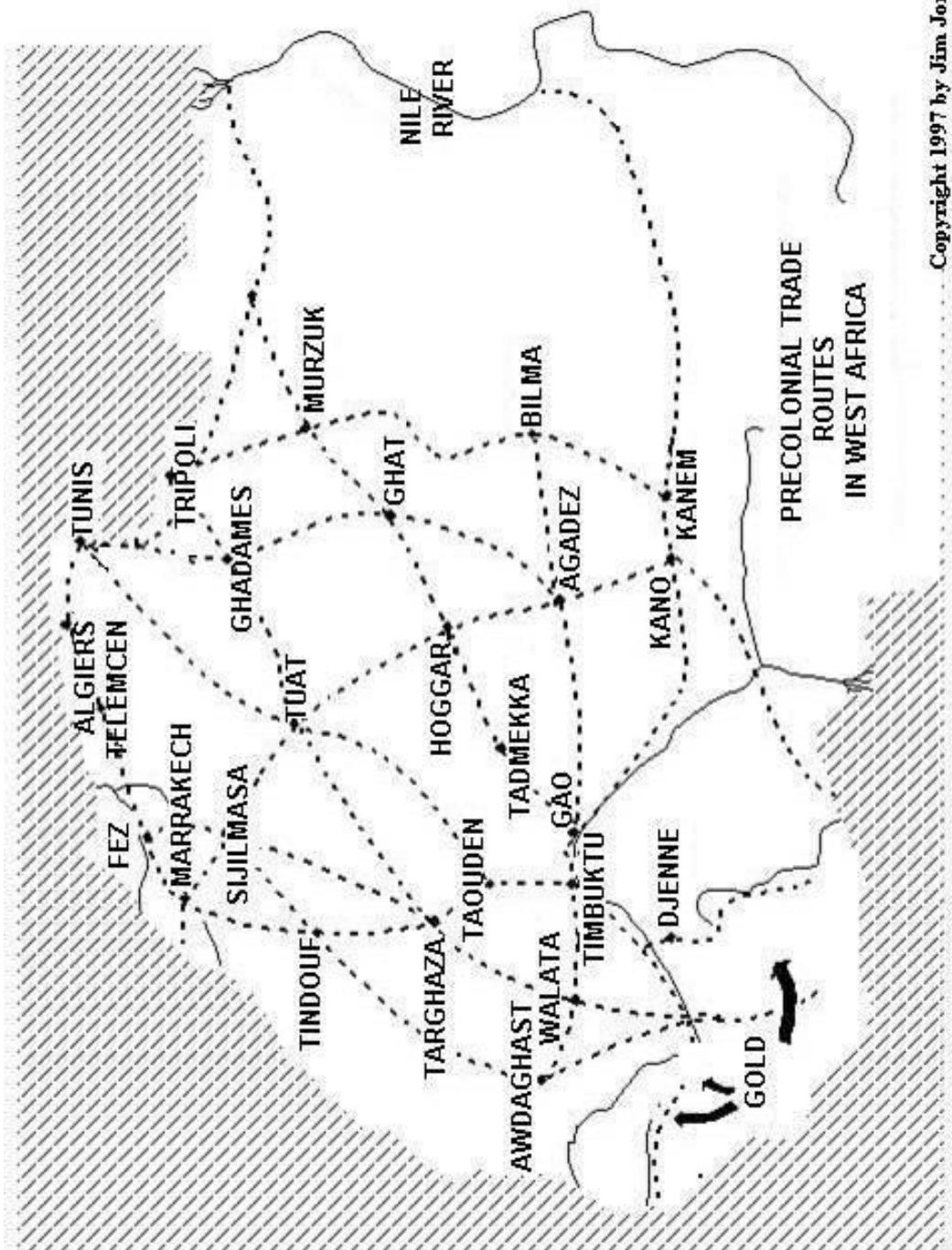
⁷ The Hyksos (Scythians) invaded the region around 1720 BC, after which there was an invasion by Libyans in 1229 BC, which was, however repelled. The Assyrians captured part of Egypt in 671 BC and were followed by the Persians who also invaded Egypt in 525 BC. A number of other invasions took place afterwards and were carried out by the Macedonians under Alexander in 333 BC, the Romans under Julius Cesar in 50 BC, the Arabs in the seventh century AD, the Turks in the 16th Century AD, the French with Napoleon (1798-1801 AD) and the English invasion of 1882 AD (Diop, 1974).

⁸ Depending on various historical interpretations, the Egyptian culture/civilization can be traced from 17,000 BC to about 3,200 BC when Menes unified Upper and Lower Egypt into a kingdom. By then the calendar (4245 BC) and the transmission from Meroitic Sudan to Egypt (4000 BC) of the 12 hieroglyphs that were the first embryonic alphabet had taken place (Diop, 1974).

⁹ Nubia refers to Sudan or the Land of Kush south of Egypt, which was called “land of the gods” by the Egyptians (Diop, 1974).

Diop's theories seem highly controversial to many Westerners and Egyptologists, often European, who prefer that the origin of modern civilization be attributed to whites, he has a wide following on the African continent and in certain academic circles.

The single most important development in the history of northwestern Africa was the use of the camel as a transport vehicle. In ancient times, the Egyptians and Carthaginians engaged in just a trickle of commercial trade with West Africa, even though the region was rich in gold, other precious metals, ivory, and other resources. The reason for this was the imposing barrier of the Sahara, which in Arabic simply means "The Desert". Around 750 AD, under the influence of Islamic peoples, northern and western Africans began to use the camel to transport goods across this forbidding terrain. Camels do several things exceptionally well: they can carry unbelievably heavy loads for impossibly long distances and they can keep their footing on sandy terrain. It was as if someone had invented "sand ships". The effects of camels on West African culture were just as profound as if they were sea-going ships (Hooker, 1996). In essence, the Arab trade caravans enhanced the development of urban communities and the centralization of political power in West African kingdoms that regulated and controlled trade (Martin & O'Meara, 1995). Salt and gold were the driving forces behind the desert trade. Wangara Gold came from two distinct areas: 1) the Lobi area of Upper Volta (Burkina Faso) and 2) the Guinea-Conakry/Mali area between the confluences of the Niger, Senegal and Falémé Rivers, while salt was mined at Taghaza (Targhaza) (see Figure 1.2) (July, 1970).



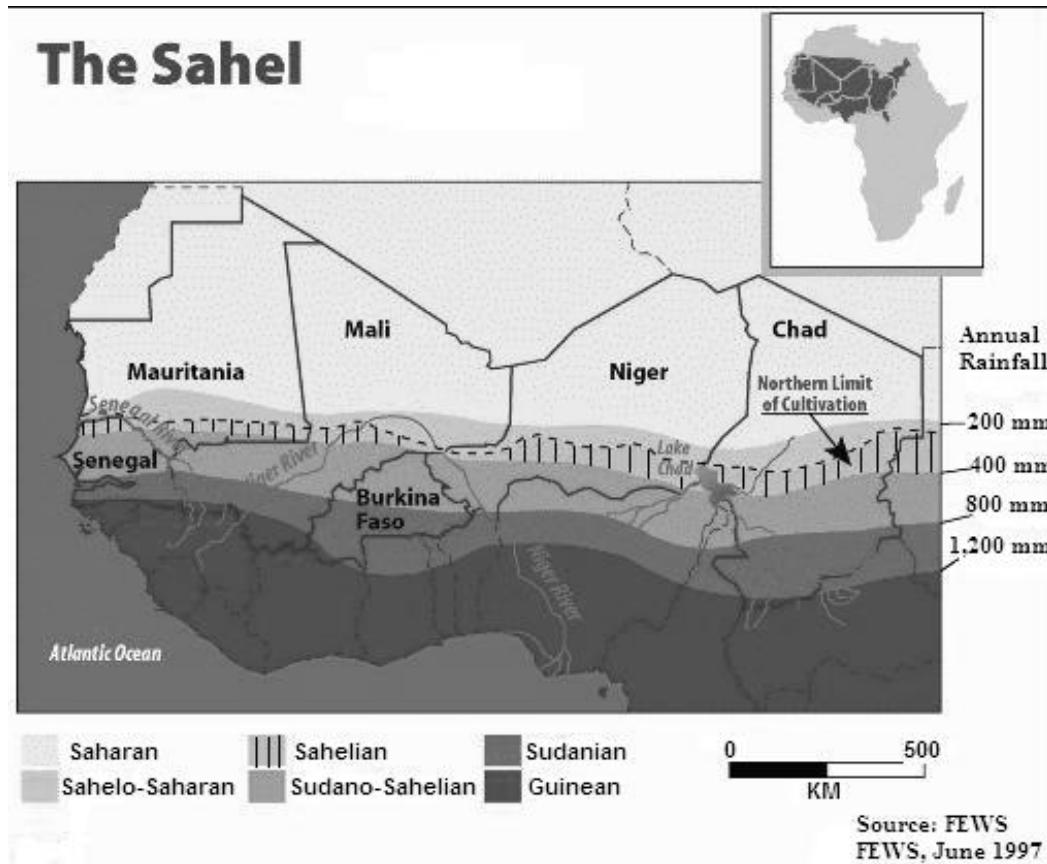
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Source: Jones (2005) with permission, Jones.

Figure 1.2: Ancient Saharan caravan trade routes

The most important developments occurred in the Sahel (Figure 1.3) area just south of the Sahara; the Sahel provided southern terminal points with the goods

being shipped across the Sahara. The Sahel is a dry, hot area on the edge of the desert with fertile areas mostly along river floodplains, and grasslands. All of the major North African kingdoms arose in this area: Ghana, Mali, Songhay, and Kanem-Bornu: the Sahelian kingdoms (Hooker, 1996) (Figure 1.1).



Source: FEWS (1997) with permission, USAID/FEWS NET, Famine Early Warning Systems Network + U.S. Government public domain

Figure 1.3: The Sahel

Historians Brooks (1986; 1993 *In: McCann, 1999*) and Webb (1995 *In: McCann, 1999*) state that West Africa's empires were heavily influenced by historical zones that were not fixed by geographical boundaries but by shifting rainfall boundaries (isohyets) that generate particular types of vegetation and impose specific constraints on human activity (Figure 1.3):

- The 100-200 mm isohyets separate the Sahara desert from the Sahel;
- The 400 mm isohyet form the southern border of the Sahel, where drought tolerant crops like sorghum and millet were cultivated;
- South of the 400 mm isohyet, are the Sudano-Sahelian and Sudanian savanna zones and this is more or less also the northern limit for maize cultivation; and
- The 1000-1,200 mm isohyets define the forested savannas zone and the northern limit of the tsetse fly (vector of human and bovine sleeping sickness/trypanosomiasis) habitat, south of which only the N'Dama cattle are resistant to the tsetse fly (trypanotolerant), as opposed to the more drought tolerant zebu (*Bos indicus*).

These authors also argue that the 1,000 mm isohyet and the tsetse fly provided a protective screen to agricultural societies against horse-raiding people from the north. This zone in West Africa fluctuated as much a 200 km north and south, thereby altering the livestock economy and military advantage. Nash (1969 *In* : Smith, 1992) places the minimum rainfall for survival of the tsetse fly as 500 mm meaning that by 6,500-4,500 years ago (4,500-2,500 BC) the Sahara would have been too dry for the fly.

This fluctuation is related to the Inter-Tropical Convergence Zone (ITCZ) with its bimodal wet and dry seasons, characterizing the African continent as a whole. Variations from year to year and in location depend upon elevation, topography, and global climate anomalies such as El Niño and tropical Atlantic surface circulation. Several years of short or delayed rains constitute drought, historically a common occurrence in much of Sub-Saharan Africa (McCann, 1999).

Webb (1995 *In*: McCann, 1999) argues that shifts in climate/ecology/economy that took place between the 14 and 17 centuries AD brought the desert, savanna and Sahelian peoples into closer contact with each other and produced a new

historical identity that blended the economies and historical traditions of the Arab, Amazigh (Berber) and Mande peoples. It is argued that the growth of Timbuktu from 10,000 people in 1325 AD to a commercial and intellectual center of 30,000 – 50,000 people in 1591 AD to some extent had its development rooted in ecological change. He also argues that a drier period in the 17th century AD allowed for southward military expansion and resulted in a loss of human freedom (slavery) as the desert moved southward and waves of political violence broke onto the savanna, catching black Africans in the undertow.

McCann (1999) argues that the physical environment of the great empire states was not a fixed canvas, but rather a shape-shifting stage that demanded a continuing set of adaptations of economic base and political structure. Africa's Sahelian Zone from Senegal to Eritrea has always been a stage for struggle between climate, water resources and human strategies of political, social and economic organization. Great African empire states from Ghana, Mali and Songhay in the west, Bornu, and Darfur farther east (an area of conflict in 21st century AD; see Chapter 5, Section 5.11.4, Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics and Chapter 13, Section, 13.10.1.6 Oil-scorched earth Sudan), as well as Nubia and Aksum in the Nile Valley all managed to link long-distance trade, urban settlements and sophisticated politics with farm-level successes in food production within arid and semi-arid zones. These achievements were particularly remarkable because they meant overcoming the Sahel's environmental challenges. The decline of civilization in the Niger Valley at the end of the 16th century AD was due to a wider set of factors than an invading army from Morocco or even the impinging desert (McCann, 1999). These factors included (McCann, 1999):

- Decreasing farm productivity;

- The retreat of livestock herds in favor of camel husbandry (under dryer conditions); and
- The loss of population to slavery.

Ecology played a major role in this evolution. McCann (1999) tries to promote the idea that desertification in Africa is attributable to global climatic processes more than local human action, although in his epilogue he admits that changes in human land use and the human population have wrought the most profound transformations of Africa's landscape mosaic, with the population proving consistently cumulative in affecting the look of the land in the late 20th century AD.

The following discussion is not meant to be all inclusive of pre-colonial African civilizations, but demonstrates that vibrant civilizations existed, rich in culture, both written and oral history, strong military forces, lucrative trade, and well developed urban centers, some on par with anything found in Europe at that time. July (1970) explains that every one of the medieval savanna kingdoms described below possessed traditions involving migrations of ruling dynasties from the north and east, these rulers soon becoming absorbed into Negro kingdoms that held the reins of government during the apogee of powerful Sudanic states such as Ghana, Mali and Songhay (Songhai).

The bulk of the savanna population was and is a product of racial intermixing, with villages of completely different tribal and cultural backgrounds peacefully co-existing (e.g., Fulani pastoralists of mixed Caucasian/Negro blood intimately linked to Sudanic communities, grazing during the dry season on farm residue while manure from their livestock helped fertilize the Bantu farmers' soils; (see Chapter 2 for more details). The Sudanic civilization's ability to adopt, absorb and utilize outside influences is best exemplified through the spread of Islam,

which was integrated into animist religions, by the Fulani along trade routes in the 13th century AD. Initially, Islam primarily took hold in cities such as Gao, Kano, Awdogha, Walata, Kumbi Saleh and Timbuktu (Figure 1.2) along the caravan routes, whose commercial activities made them receptive to outside influences, and where the African and Arab world mixed (July, 1970).

Ancient Ghana existed for three centuries, Mali for 400-500 years, and Kanem-Bornu for about 1,000 years. These Sudanic Negro kingdoms' political authorities were structured at two levels (July, 1970):

1. **The Villages** with individual heads of families, a council of elders and the chief quite unaffected by imperial states.
2. The principle of **Lineage and Age Groups** was spread over a number of villages. This meant that people had a fixed status such as rulers, nobility and serfs, carrying out inherited occupational roles such as farmers, merchants, craftsmen, blacksmiths and hunters, or inherited civic functions that changed through successive age grades.

State making occurred when the leader of one of these affiliations succeeded by persuasion or force to impose his authority on a number of independent villages. Rulers depended on maintaining clan relationships that supplied them with troops, tribute, labor and servants. These savanna kingdoms were rarely homogenous culturally or ethnically, with imperial expansion often outrunning the ability to administer or police, nor was there orderly transfer of power through succession (July, 1970). One will observe that the exact dates of key events vary widely with historians.

1.4.1 Ancient Ghana

Ghana was the earliest known kingdom of the Sudan. Control of Wangara gold assured its prosperity (July, 1970). Ancient Ghana's boundaries included most of modern Mali and parts of modern Senegal and Mauritania (Figure 1.1). Modern Ghana, formerly the Gold Coast during the colonial era, was named after this great state of African antiquity. The ancient state of Ghana emerged some time around the seventh century AD. However, its oral records, which list over 144 kings, place its existence some time around the seventh century BC (The Sankofa Project, 1999). McCann (1999) places the duration of the Empire of Ghana from 400 – 1250 AD. The Berbers (Tuareg), a Caucasoid primarily nomadic people formed a new kingdom called Ghana or Awkar in what is now southeastern Mauritania in the fifth century AD. This Berber kingdom would form the model from which all the Sahelian kingdoms would be built. The Tuareg are justly famed as the founders of Timbuktu, which began as a small Tuareg village around 1100 AD (MacDonald, 2002). Timbuktu was conveniently located at the end of the trade route with links to Venice, Genoa and Cairo (July, 1970). However, the Songhay, a Sub-Saharan group, were the primary occupants of Timbuktu as it became a city (MacDonald, 2002). Eventually the Soninke, a Mande-speaking people living in the region bordering the Sahara, dominated the state. They built their capital city, Kumbi Saleh, right on the edge of the Sahara and the city quickly became the most dynamic and important southern terminus of the Saharan trade routes (Hooker, 1996). By the 11th and 12th centuries AD, Ghana had become a great military power. Ghana continually suffered from competition with Awdogha (Figure 1.2) to the west that was controlled by Sanhaja Berbers and competed with Ghana as a major trade route terminus.

A hereditary king called the *Ghana* reigned supreme (Hooker, 1996) over a matrilineal empire, the sister of the King providing the heir to the throne. The

king was assisted by a people's council chosen from the social strata, indicating sophisticated political development (The Sankofa Project, 1999). At the peak of its empire, Ghana's population of several million occupied a territory of about 647,500 km² (250,000 mi²). An army of 200,000, containing about 40,000 archers helped to maintain the king's imperial might (ANON, 2002b)

The king controlled the flow of gold from the south and the traffic of salt from the north (MacDonald, 2002). The gold trade was largely responsible for the development of Ghana into a powerful, centralized kingdom. Gold was traded for salt that came down from the Sahara desert (from Morocco and Algeria) (ANON, 2002a). The Kingdom of Ghana rapidly expanded into an empire conquering local minor states and boasting a mixed economy of extensive agriculture, iron smelting, stonemasonry, carpentry, pottery, goldsmithing, and cloth manufacturing. Trade passed from West Africa east to Egypt and the Middle East, primarily involving gold, salt, copper, and even war captives to be sold as slaves (The Sankofa Project, 1999).

The Kingdom of Ghana never converted to Islam, even though northern Africa had been dominated by the faith since the eighth century AD. The Ghanaian court allowed Muslims to settle in the cities encouraging Muslim specialists to administer the royal court and advise the government (The Sankofa Project, 1999). Islam was mainly in urban areas, while rural areas remained animist. With the collapse of Ghana in the 11th century AD, Islam became a state religion among the Sudanic civilizations, with Songhay cities such as Djenné and Timbuktu having Islamic universities by the 16th century AD (Martin & O'Meara, 1995).

In 1076 AD, a Berber army from Morocco led by religious reformers called *Almoravids* attacked Ghana, declaring a *jihad* (holy war). By 1087 AD, the

empire disintegrated into several smaller states, including Kangaba out of which the Empire of Mali arose (ANON, 2002b). July (1970) places the final collapse of Ghana at 1203 AD, when the Soso chieftancy of Kaniaga's leader Sumanguru Kanté, (Kaniaga was a former vassal state) sacked Kumbi Saleh, the chief mercantile and intellectual center in the Sudan. Merchants moved about 161 km (100 mi.) north to Walata (Figure 1.2) that soon emerged as the major caravan terminus of the region.

1.4.2 Ancient Mali and the Mandingue (Mandinka/Malinké) Empire

Despite the fall of the Ghana Empire and the rise of the Islamic Mali Empire in 1235 AD, control of the gold-salt trade remained the economic lifeline of the region and resulted in the establishment of a second major gold-salt trade route northeast across the Sahara, which passed through Tunis, and Cairo and thereby complimented the traditional western Sudan—Maghreb—Europe trade route. This second route increased Egypt's influence over western Sudan (ANON, 2002c). Once Ghana had been conquered, Sumanguru Kanté moved south along the upper reaches of the Niger River to subdue the Mandinka (Malinké) Negroes occupying fertile farm land near one of the sources of West Africa's gold supply (July, 1970). The Soso leader Sumanguru Kanté did not govern as sole monarch, but ruled a federation of subject states, one of which was Mali that had fallen under Soso control by the first quarter of the 13th century AD (Sankofa Project, 1999). Mali incorporated three subgroups or factions, namely Malinké/Mandingue (Mandinka), Bambara and Diaghanké (Kake, 1983).

1.4.2.1 Sundjata (Sundiata) Keita

The historical founder of Mali was a mystic by the name of Sundjata Keita (Sundiata). He was said to have begun as a royal servant and magician among the

Soso peoples who then ruled the Ghanaian Empire (Sankofa Project, 1999). It is said that Sumanguru Kanté put all the sons of the Mandinka ruler to death except the cripple Sundjata Keita, who was consequently able to obtain local support in the creation of a guerrilla army that defeated and killed Sumanguru Kanté in 1235 AD (July, 1970). It was under Sundjata Keita that the *Donso (Dozo)* warrior hunters developed, who have managed to survive colonialism and independence into the 21st century in much of West Africa (see Chapter 2, Section 2.1.6, Hunting Guilds as a Means of Controlling Access to Wildlife and Chapter 9, Section 9.8.9, *Gestion des Terroirs*, West Africa). Mali became one of the immense states of pre-modern Africa and had a complex governmental structure headed by the king and managed by officials, sub-kings, and bureaucrats. The *griot* became famous as an oral historian, a tradition passed down through generations of Mande bards and which is still common across much of today's West Africa.

The Soso were absorbed, the remnants of Ghana annexed in 1240 AD and control was taken of the Wangara gold (July, 1970). Sundiata ruled Mali from about 1230-1255 AD, expanding Mali's empire west to the Atlantic Ocean, south deep into the forest, east beyond the Niger River, and north to the salt (Taghaza) and copper mines of the Sahara (July, 1970; The Sankofa Project, 1999). At its height, Mali was a confederation of three independent, freely allied states and 12 garrisoned provinces (The Sankofa Project, 1999). It was during this period, in the 13th century AD that Timbuktu began its development as an *entrepôt* for desert caravans (July, 1970).

It is said that while Mandinka princes were Muslim, Sundiata remained an animist with a power base and administration built upon his relationships with clans and lineage groups rooted in a farming economy (July, 1970).

With the death of Sundiata in 1255 AD, additional conquests were made by Wali (1255-1270 AD) and Sabakura (1285-1300 AD) a freed slave of the royal household who seized power. One of these two conquerors first brought Songhai under Mali suzerainty (e.g. as a semi-autonomous vassal state). Sabakura was responsible for the capture of Gao to the east, often attributed to the popular Mansa Musa (July, 1970).

1.4.2.2 Mansa (Kankan) Musa

The Malian king, Mansa (Kankan) Musa (1312-1337 AD) expanded Mali's influence over the Niger city-states of Timbuktu, Gao, and Djenné. Mansa (Kankan) Musa, a devout Muslim, built magnificent mosques throughout Mali (The Sankofa Project, 1999). By then the Mali Empire reached north into the present areas of Mauritania and southern Algeria, and south into the northern Nigerian Hausa states (ANON, 2002b).

In 1324 AD, Mansa (Kankan) Musa made a pilgrimage to Mecca with an entourage of 60,000 people and 80 camels carrying more than two tons of gold to be distributed among the poor. Of the 12,000 servants, 500 carried staffs of pure gold. The saturated gold markets of regions such as Egypt were ruined for months/years after Musa's visit (July, 1970; The Sankofa Project, 1999). In spite of his devotion to Islamic religion and civilization, Musa continued to rely on traditional institutions (clans, lineages) and their animist beliefs for the administration of his realm. Despite the might and glory of Mali's great leaders, the integrity of local chieftaincies was scrupulously observed (July, 1970).

Under Mansa (Kankan) Musa, Timbuktu became one of the major cultural centers not only of Africa but also of the entire world. Vast libraries were built and *madrasas* (Islamic universities) established. Timbuktu became a meeting-place of

the finest poets, scholars and artists of Africa and the Middle East (The Sankofa Project, 1999). Returning from his *hajj*, Musa brought back Muslim scholars, architects, and other skilled men. Students and professors from all over the Muslim world were attracted to this intellectual center (July, 1970; ANON, 2002b).

The days of the charismatic warrior-kings were past. No longer were *mansa* seen as semi-mythical leaders in battle. The *mansa*'s powers had been delegated to him by the will of Allah, to whose all-powerful judgment the *mansa*, along with the lowliest of his subjects, had to submit. The faith of the *Q'uran* and traditional beliefs (animism) were practiced side-by-side, often by the same communities and even by the same individuals, still the case today over much of West Africa. Such a "mixed Islam" became a hallmark of religious experience in West Africa, helping contribute to social and political stability. Unfortunately, throughout the history of the Sudanic regions, such "tolerant" forms of Islam were open targets for the *jihads* (Islamic religious wars) of strict-minded Muslim reformers from North Africa and the Sahara. Islamizing kings were not always regarded with affection by non-Muslim subjects, which is one reason Musa, who was written about in Arabic sources, is conspicuously absent from West African oral traditions, probably because he was seen as a betrayer of ancestral heritage. By 1455 AD, the Mali Empire extended all the way to modern-day Gambia (Kake, 1983)

1.4.2.3 Collapse of an empire

In spite of Sundiata's efforts in the 13th century AD to ensure continuity of the office of *mansa* within the Keita (a Mandingo/Malinke name) line, troubles with succession were latent from the beginning. Sundiata seems to have intended the *mansaship* to pass in fratrilineal order, from brother to brother, not father to son.

Claims of sons, combined with rivalry between and within the two main family lines (descendants of Sundiata and of Manding Bory, a brother of Sundiata's), led to a series of destructive palace intrigues from the late 14th century AD onwards (Rotondo-McCord, 1998a).

Weakened by internal quarrels, Tuareg (Berbers) from the desert challenged Mali's position in the trans-Saharan trade, capturing Timbuktu between 1433 and 1434 AD (July, 1970; Rotondo-McCord, 1998a) and Walata (July, 1970). Brooks (1993 *In: McCann, 1999*) argues that dry conditions forced Tuareg camel pastoralists south.

In 1468 AD, Sunni Ali of the rising Songhay (Songhai) Empire captured Timbuktu and five years later the impregnable town of Djenné (Jenne) (see Figure 1.2) (July, 1970). Mali's collapse as a major Sudanic power was sealed by the rebellion of Songhay under the leadership of the Sunni dynasty, whose 15th century AD scion Sunni Ali would carve a Songhay empire out of many of the lands previously under Mali's control (July, 1970; Rotondo-McCord, 1998a). Still the Empire of Mali was important enough that in 1484 AD Portugal sent a resident ambassador (ANON, 2004). The other great nomads of the savanna belt, the pastoralist Fulani, broke Malian hegemony in the Senegambia region by the early 16th century AD (Rotondo-McCord, 1998a). Mali's power lingered on in the West but was finally snuffed out in the mid-17th century AD with the appearance of the Bambara states of Kaarta and Segu (Segou), changing Mali's 400 years as an empire back to that of a small chieftancy on the upper Niger River (July, 1970).

1.4.3 Songhay (Songhai) Empire

The people of Songhay were farmers and fisherman who lived along the Niger River (July, 1970; The Sankofa Project, 1999), in what is today northwestern Nigeria (July, 1970) converting to Islam around the 1200s AD (The Sankofa Project, 1999). It is said that invaders from the north, possibly refugees from Kush after the fall of Meroe or Berbers established the Za dynasty but were soon absorbed by the local population (July, 1970).

Gao (Figure 1.2) was established well over a thousand years ago (possibly in the 700s AD) on the right or southern bank of the Niger as a trading camp used by Sorko fishermen and hippopotamus hunters. The Sorko camp, on the opposite side of the river from Saharan trade routes, was protected from nomadic raiders, while at the same time tempting these desert nomads to establish more peaceful trading contacts. Berber merchants brought salt from the Sahara to this early Gao in return for grain, textiles, slaves, and other items. The Berber merchants (now Islamized) set up a permanent base on the left or northern bank of the Niger - Gao-Sané - in order to trade even more efficiently with right-bank Gao. By the ninth century AD, Gao was becoming the center of the Za-Songhay state and an important link in the wider trans-Saharan trading network. With the coming of Islam to the Gao court at the turn of the millennium, closer ties were forged between the newly converted Za rulers and the Muslim Berbers on the other (left or northern) side of the river; they even shared a common place of prayer (Rotondo-McCord, 1998b).

A Songhay Kingdom in the region of Gao existed since the 11th century AD, but came under the control of Mali in 1325 AD (The Sankofa Project, 1999) under the reign of Mansa Musa (July, 1970). By the 15th century AD, Songhay had reasserted its independence from a weakened and collapsing Mali and under the

leadership of the Sunnis, Muhammad Da'o and Sulaiman Dama, a number of Bambara groups were absorbed as well as parts of Macina. However, its main imperial thrust began in 1464 AD with Sunni Ali (July, 1970).

1.4.3.1 Sunni (Sonni) Ali

Songhay would not fully eclipse Mali until the reign of the Sunni king, Sunni Ali, who ruled from 1464-1492 AD (The Sankofa Project, 1999). Gao was said to have a population of 60,000 inhabitants (Martin & O'Meara, 1995).

Sunni Ali turned the Kingdom of Gao into the Songhay Empire. Ali based his military on a cavalry and a highly mobile fleet of ships on the Niger River (July, 1970; The Sankofa Project, 1999; Brooks, 1993 *In: McCann, 1999*). He conquered the cities of Timbuktu and Djenné, the major centers of education and trade of the Mali Empire and drove the Berbers from the region (The Sankofa Project, 1999). He also overran the whole Niger country from Djenné (Jenne) to deep into the homeland of the Mossi (today's Burkina Faso) whose independent kingdoms had existed since the middle of the 11th century AD. Similarly, to Sundjata Keita, Sunni Ali created an empire through rapid military conquest and constructed an administrative system based on customary practice, thereby converting military victory into a permanent political force. He divided the empire into provinces and appointed officials, coordinated the traditional cults on behalf of the state and exercised constant pressure on divisive forces such as the Fulani of Macina and the tribes of the Hombori Mountains (in present-day Mali) (July, 1970).

He also refused fully to accept Islam, advancing African traditions (ANON, 2002b). While professing Islam, he persecuted the Muslim scholars of Timbuktu when he felt they challenged his authority as a magician king (animist) at the head

of a traditional hierarchy (July, 1970). The prosperity of cities under the Songhay regime led to the formation of an urban elite with strong ties to both Saharan merchants and Muslim clerics (*ulama*), who developed a theocratic “ideology of protest” seeking to make the state dependent on Muslim law or “*Shari'a/Shariah/Sharia*”. Sunni Ali, a Muslim, was also known as a powerful magician-king, reminiscent of the legendary kings of the Malinke such as Sundiata. He favored a balance of political and religious powers, in which the interests of both Muslim city-dwellers and rural non-Muslims were accommodated. Unwilling to submit to the new “revolutionaries”—the *ulama*—Sunni Ali targeted clerics for exile, prison, or even death. His style of rule, reminiscent of medieval Europe, was destined both to perish with the rise to power of the pro-*ulama* *askiyas* after 1492 AD and to be condemned as pagan and evil in later Muslim histories of the Songhay (Rotondo-McCord, 1998b).

The copper mining town of Takedda, on the eastern trans-Saharan trading route, contributed to the Songhay Empire’s financial growth, while trade along the eastern trans-Saharan route, created during the Mali Empire, also reached its peak (ANON, 2002c).

1.4.3.2 Askia Muhammad Touré

When Sunni Ali died by an accident in 1492 AD, around the same year Christopher Columbus had reached the western hemisphere, his governor of the western Hombori province, charismatic Muhammad Touré (of Songhay and Soninke descent) usurped the throne and established the Askia dynasty (July, 1970; Rotondo-McCord, 1998b). Askia Muhammad Touré’s Songhay dynasty lasted from 1493-1528 AD (The Sankofa Project, 1999). Years of victorious campaigning had led to the development of a well-trained Songhay fighting force in which men of even modest social rank could rise to the top on the basis of

talent and accomplishment. Muhammad Touré (Turé) had considerable backing of the army, and as a pious Muslim was favored by the clerical urban elite of Timbuktu and other cities (Rotondo-McCord, 1998b).

In 1492 AD, when Sunni Ali's son Abu Bakr refused to establish Islam as the religion of the realm, Muhammad Touré and his pro-Muslim followers declared a *jihad* against the enemies of the faith within Songhay. By the spring of 1493 AD the Muslim forces were victorious, and the first of the *askiyas*, Muhammad Touré, became the undisputed ruler of Songhay (Rotondo-McCord, 1998b).

He found the decentralized administration, relying on traditional local authorities and animism, inefficient and impious to Islam. He therefore created a highly centralized state where the *askia* (*askiya*) had the power to appoint ministers and regional administrators, impose taxation and rule over a professional army (July, 1970; The Sankofa Project, 1999; ANON, 2002a). He also encouraged scholarship and learning and used the combination of Islam and commerce to build his kingdom, thereby bringing peace and stability to the region (ANON, 2002a).

After, Muhammad Touré had conquered Mali and Hausaland, his kingdom covered most of West Africa and was larger than all of the European states combined. With literally several thousand cultures under its control, Songhay ranked as one of the largest empires of the time (The Sankofa Project, 1999). During the 16th century A.D, Songhay developed the most complex and centralized constitutional structure ever known to medieval Sudan, governing a vast empire of 1.3 million km² (half a million mi.²) with central government headquartered in Gao. A professional bureaucracy functioned solidly for almost a century (from the accession of Muhammad Touré in 1493 AD to the Moroccan conquest of 1591 AD). This surpasses the Frankish king Charlemagne, whose

attempts to develop a complex administrative system, seven centuries earlier in medieval Europe, had met with no lasting success (Rotondo-McCord, 1998b).

He was also the first to standardize weights, measures, and currency, with the result that culture throughout the Songhay Empire began to homogenize. He replaced traditional Songhay administrators with Muslims in order to Islamize Songhay society and he also appointed Muslim judges, called *qadis*, to run the legal system under Islamic legal principles. These programs of conquest, centralization, and standardization were the most ambitious and far-reaching in Africa at the time. However, the vast majority of the Songhay people, around 97%, followed traditional African religions. Islam continued to be primarily urban based (The Sankofa Project, 1999).

Timbuktu once again became a prosperous commercial city, reaching a population of 100,000 people, to which merchants and traders journeyed from Asia, the Middle East and Europe to buy gold. It also became an intellectual center in the Muslim world. Students from various parts of the world came to Timbuktu's famous University of Sankore to study law and medicine. Medieval Europe sent emissaries to the University of Sankore to witness its excellent libraries with manuscripts and to consult with its learned mathematicians, astronomers, physicians, and jurists (The Sankofa Project, 1999).

1.4.3.3 Collapse of an empire

The king's reliance on Islamic advisors divorced him from his pagan people and the old system of clientelism through clan and lineage, thereby destroying traditional checks and balances without substituting new loyalties. Selecting provincial governors from royal households rather than from among traditional leaders increased the possibility of revolt (July, 1970). Songhay's very size would

lead to its downfall, encompassing more territory than could be controlled (The Sankofa Project, 1999). Muhammad Touré fell from power in 1528 AD, deposed by his son, and followed by 60 years of eight mediocre kings and palace revolutions, the problem of succession never being resolved (July, 1970). After the reign of Askia Duad, (1549-1582 AD) subjects began to revolt. Even Songhay's massive army, said to consist of over 35,000 soldiers, archers and cavalry, could not keep order. The first major region to declare independence was Hausaland (The Sankofa Project, 1999).

To the north, European sea routes were beginning to bypass Morocco as a key link on the trans-Saharan trade route. Therefore, Morocco sought compensation elsewhere. During the 16th century AD, the salt-producing center of Taghaza (Figure 1.2) and other desert oases were periodically attacked by Morocco but never held; the long-term plan being to advance on Songhay and its source of gold. The Songhay felt protected by the barrier of the Sahara Desert (July, 1970). In 1591 AD (July, 1970; The Sankofa Project, 1999), an Andalusian (Spain was at the time under control of the Moors of Morocco), Judar Pasha, led 3,000 Moroccan soldiers across the desert just north of Gao on the Niger River. Although much smaller than the Songhay army, it was made up of European mercenaries with muskets, for which the Songhay bows and arrows were no match. Military defeat was quickly followed by political collapse. Morocco found none of the wealth it desired, though Moroccan soldiers occupied Gao and Timbuktu, ruling the region first as a protectorate, but gradually being absorbed into the local population and creating a politically feeble state. However, this defeat spelled the end of the Songhay Empire, resulting in political disintegration, famine and plague. The once mighty empire was reduced to hundreds of village states with raids and petty warfare becoming the hallmark of the times, while trade suffered and Islamic culture atrophied (July, 1970). In 1612 AD, the cities of Songhay fell into general disarray and one the greatest empires of African

history disappeared from the world stage forever. Since this time, no African state has risen to such prominence and wealth as did mighty Songhay (The Sankofa Project, 1999). Only in the 18th century AD did larger states begin to appear; Macina (Fulani controlled) and the Bambara kingdoms in Kaarta and Segu (July, 1970).

Brooks (1993 *In: McCann, 1999*) argues that a wet period between 1500 AD and 1630 AD helped trans-Saharan trade to flourish and the Songhay Empire to control the trade routes further north than Ghana and Mali. On the downside, these conditions allowed Moroccan forces to conquer Songhay in 1590-91 AD, though they were unable to penetrate further south than the trans-Saharan trade route because of the presence of the tsetse fly. By the 1630s AD, Moroccan sultans, unable to compete in the long run with the European mercantilist powers that had been both rivals and trading partners, had lost almost complete control over Songhay. Africa, both north and south of the Sahara, would increasingly come to suffer the effects of a European economy, which thrived on aggressive expansion as the Middle Ages gave way to the modern era (Rotondo-McCord, 1998b). Serving as a prelude to later European arrivals, the golden age of West African empires was over (ANON, 2002b).

1.4.4 Kanem Bornu and the Hausa Kingdoms

Before the dawn of recorded history, and halfway between the Niger and the Nile, lay a vast landlocked sea, which after centuries of climatic warming and desertification would become Lake Chad. Though much smaller than its prehistoric predecessor, Lake Chad until the last 3 decades of the 20th century remained one of the largest inland bodies of water in the world (see Chapter 7, Dams, Section, 7.8.1.5, Waza Logone floodplain, Cameroon). It is also one of the most important sites of human settlement in African history. Lifestyles ranged

from hunting and fishing to pastoralism and agriculture. This diversity of cultures and economies would encourage exchange between societies in the region, but would also mean that competition would intensify as groups followed different paths of social and governmental development. Lake Chad was by virtue of its central Sudanic location a natural connecting point in the vast network of Saharan and Sudanic trade. As with Mali and Songhay, this trade would provide the basis for the growth of powerful centralized states headed by kings, first on the northeast side of the lake (Kanem), and later to the southwest (Bornu) (Rotondo-McCord, 1998c) (Figure 1.1).

1.4.4.1 Kanem Bornu

Ghana, Songhay and Mali had come and gone on the African stage. Near Central Africa, however, another great empire called Kanem arose around 1200 AD (The Sankofa Project, 1999). Between the seventh and ninth centuries AD, people in the Lake Chad area were infiltrated by nomads from the Sahara of whom the Zaghawa (see Chapter 5, Section 5.11.4, Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics) were the chief group, establishing themselves as the ruling aristocracy over a wide area in the savanna around Lake Chad. Kanem was originally a confederation of various ethnic groups (The Sankofa Project, 1999). The Kanuri-speaking state of Kanem took shape somewhere between the ninth century AD (July, 1970) and 12th century (1100 AD) (The Sankofa Project, 1999) under its first king Saif who founded the Saifawa dynasty that lasted 1,000 years (July, 1970).

By the end of the 11th century AD, during the reign of the *mai* (king) Umme Jilne, the royal house adopted Islam, upon which succeeding *mais* developed close ties to Muslim states to the north and east, with pilgrimages to Mecca for both commercial and religious purposes. The strength of Kanem lay in its powerful

army. It had a rigid bureaucracy with a council of nobility and members of the royal household, a network of provincial governors from the king's relatives and an important female element in which the "mai's" first wife, his elder sister and the queen mother had privileged status (July, 1970). The Sankofa Project (1999) identifies the first Kanuri to convert to Islam as Mai Dunama Dibbalemi (1221-1259 AD). Dibbalemi declared *jihad* against surrounding minor states, beginning one of the most dynamic periods of conquest in Africa.

By the 13th century AD, the Kanuri began upon a conquest of their neighbors (The Sankofa Project, 1999). At the height of their empire, the Kanuri controlled territory from Libya to Lake Chad to Hausaland. These were strategic areas since all the commercial traffic through North Africa had to pass through Kanuri territory (Figure 1.1). Because of the military and commercial growth of Kanem, the once nomadic Kanuri eventually turned to a more sedentary way of life (The Sankofa Project, 1999).

In the late 1300s AD, civil strife within Kanuri territory weakened the empire. The Bulala people, who appear to have been vassals of Kanem, pushed the Kanuri out of Kanem in the late 14th century AD. Under Mai Umar bin Idris, the ruling house abandoned the old capital at N'jimi and established itself in Bornu (July, 1970). By the early 1400s AD, Kanuri power shifted from Kanem to Bornu, a Kanuri kingdom south and west of Lake Chad, growing rapidly with the fall of the Songhay (The Sankofa Project, 1999).

For about 100 years, the state remained weak but viable. Towards the end of the 15th century AD, it began to revive into the second Kanuri empire, beginning with Ali Ghaji (1472-1504) and his son Idris Kata-Karmabi (1504-1526 AD), who dealt blows to the Bulala in the east, the kingdom of Jukun in the south and the Hausa in the west (July, 1970).

The Kanuri grew powerful enough to unite the Kingdom of Bornu with Kanem during the reign of Idris Alawma (Alooma) from 1575-1610 AD (The Sankofa Project, 1999) or 1571-1603 AD (July, 1970), who built a Muslim state all the way west into Hausaland in today's northern Nigeria (The Sankofa Project, 1999), and east as far as Darfur (modern-day Sudan along Chad's border) (July, 1970). The Bornu were well known for their chain-mailed cavalry (The Sankofa Project, 1999) and muskets (July, 1970). Idris relied on fiefdoms given out to royalty as a means of maintaining power and control (July, 1970). The economy was agriculturally based using peasants supplemented by slaves. Slaves were an important commodity in the trans-Saharan trade, obtained by raiding to the south; young girls and eunuchs were a specialty brought to North Africa in exchange for Barbary horses, which improved military transport and thus conquest. The Kanem-Bornu Empire's decline began in the 18th century AD, which by the early 19th century AD was under threat from the Fulani who had overrun Hausaland to the west (July, 1970). By 1846, it finally succumbed to the growing power of the Hausa states (The Sankofa Project, 1999).

1.4.4.2 The Hausa Kingdoms

For centuries, the Hausa had occupied an area between Songhay and Kanem-Bornu. Folklore has it that the original ruler, Bayajidda, came from the north and was the son of the king of Baghdad. He slew a serpent harassing the people, married the local queen and his grandsons became kings of the major Hausa states of Gobir and Daura, Katsina and Zazzau (Zaria), Kano, Rano and Biram (July, 1970). July (1970) believes this refers to a series of invasions by outsiders who merged with a Negro people.

“Around 1100 AD hills rich in iron ore dotted the landscape of the region, which would come to be known as Hausaland, between the eastern reaches of the Niger River to the west and Lake Chad in the east. Until the 1100s AD, Hausaland was made up of a number of decentralized agricultural and pastoral villages called hill cults. On these sacred grounds, priests or cult-guardians exercised religious and political power within local societies active in agriculture and trade. Scholars disagree about the precise nature of Hausa growth. Some have argued that the Hausa came from the north (southern Sahara), others from the east (Lake Chad), still others that the Hausa were the indigenous inhabitants of the region. But most generally agree that sometime around 1000 AD, localized cult sites and markets began to evolve into ‘birane,’ (walled towns), ruled by ‘sarkis,’ intent on exploiting the agricultural and mineral wealth of the surrounding countryside. Growing political power of the cities led to ‘Hausaization’ of the lands between the Niger and Lake Chad. Beginning in the late 12th century AD, these villages combined into several kingdoms ruled by partly divine kings. The first of these centralized kingdoms was Daura” (The Sankofa Project, 1999).

A brisk trade across the Sahara to North Africa existed for slaves and kola nuts, the latter being one of the few stimulants permitted to Muslims. Katsina and Kano (Figure 1.2) became the major trading centers. Zaria to the south served as the slave raiding center, Rano as a center of industry and Gobir on the edge of the desert protected Hausaland from raids by nomads from the north (July, 1970).

Islam began taking root in the 1450s AD when the Fulani from the Senegal River began immigrating in large numbers to Hausaland. The Fulani immigration was driven by the desertification of North and Western Africa as they searched for land that could support their herds. Devoutly Muslim, though also retaining a great deal of indigenous beliefs, the Fulani introduced Islam and its books, setting up Islamic schools and learning centers throughout Hausaland (The Sankofa Project, 1999). The degree of commitment to Islam was slight among the general population and the ruling class, but had considerable impacts in cities. In the 15th and 16th centuries, Islamic scholars from Timbuktu visited Hausaland, living and

working in Kano and Katsina (July, 1970). The Hausa Kingdoms were closely allied with Kanem-Bornu to the east, whose military presence brought them peace and stability (The Sankofa Project, 1999). Hausaland was unified by the Fulani conquest of 1807 AD, inspired by the charismatic Sokoto *caliph* Usman dan Fodio (Rotondo-McCord, 1998d), who was exasperated by what he felt was a casual attitude of the Hausa rulers towards Islam. For the first time, this brought the Hausa states under a single ruler (July, 1970). He did not destroy Hausa culture, language or institutions, which remain important features of West African life to the present-day (Rotondo-McCord, 1998d).

1.4.5 Fulani, Toucouleur and Dioula Kingdoms, the Spread of Islam

The Fulani or Peul are a pastoral culture stretching from Senegal to Cameroon. Remnants of their former rich empires remain in places like the *royaume* of the *Lamido* (Sultan) *de* Rey-Bouba near the Bénoué River in the Adamoua (Adamawa) area of Cameroon, which still has a large slave contingent of eunuchs guarding his harem, said to number in the hundreds. This kingdom within the modern state of Cameroon, even in the 21st century AD, covers an area of 36,500 km² encompassing three national parks (Bénoué, Boubandjida and Faro) and surrounding hunting blocks. The power structure is centered around the *Ardo* or *Baaba* (father), also known as *Lamido* with both religious and secular powers due to his divine kinship linked to the Muslim religion. He controls access to all resources in his area, with a court (*faddah*) consisting of the *kaygama* (prime minister), *galdima* (controller of agricultural land), *sarkin sanu* (controller over cattle and grazing) and *alkali* (judge). There are also provincial administrators or emissaries (*nelaabe*, or *doogarii*) followed at the lowest level where each village (*ouro*) has a chief (*djaor'en/jaoro*). These well structured systems of traditional rule still survive over much of Northern Cameroon, co-existing with the Western form of government that has been imposed on them (Mayaka, 2002). This

kingdom is basically sovereign, though agreements exist to allow the national government of Cameroon control over access to wildlife, at least by outsiders (e.g., safari operators, sport hunters and tourists). Access to fish, pasture and agricultural land is still largely controlled by the kingdom.

The collapse of Songhai Empire at the end of the 16th century AD marked the end of an era in western Sudan. Afterwards there was a move away from 200 years of centralized governance. The many smaller states that arose were animist or nominally Islam, such as the Bambara states of Kaarta and Segu, and the Mossi whose empire was in the region of today's Burkina Faso. The Fulani state of Macina was animist until 1776 AD, while as discussed, the Hausa royalty was superficial in its approach to Islam. Only Bornu was a major Muslim state. In the rural areas, from Senegal to Chad, the bulk of the rural people continued to remain animist, Islam being concentrated in urban centers. (July, 1970).

Muslim islands included the network of market villages maintained by the Dyula (Dioula) or Mandinka traders throughout the West African savanna and forests. Kunta Arab nomads from Southern Algeria grazed their cattle along the south banks of the Niger River, influencing the Fulani (July, 1970).

The origin of the Fulani is highly debated. July (1970) describes them as a mixture of Berber and Negro from the Fouta (Futa) Toro along the Senegal River. Kake (1983) provides a number of theories on their origin, from descendants of orthodox Jews, French mercenaries who settled in Upper Egypt, ancient Roman legionaries lost in the desert, pastoralists pushed out of the Nile Valley by the *sécheresse* (drought), to originating from the Sahara. In one way or another, they intermarried and mixed with the Bantu cultures. Their language can be placed in West Africa and is similar to the Serere and Ouolof (Wolof, Djolof) of modern Senegal and Gambia. Kake prefers to describe them as a community of people with similar cultural and linguistic characteristics – an ethnic group rather than a

race. This includes the sedentary Toucouleur (Toucouleur) in the extreme west along the Senegal River, the Fouta Djallon Peul of Guinea-Conakry (sedentary agro-pastoralists) and the Fou Foulbe of Cameroon. In between are the pastoralist such as the Bororoje of Hausaland and the Mbororo (Bororo) of the Adamoua area of Cameroon. It is in the Senegambia area where they prospered prior to creating empires in the 17th and 19th centuries. Diop (1974) believes the Fulani to be the result of mixing between black/white races but implies this occurred in the region of the Nile rather than in West Africa.

As all over West Africa (Western Sudan), the rural Fulani were animists while those in towns adopted Islam. Certain clans of Torodbe Fulani were inspired by the Quadrya (Qadiriyya) Brotherhood brought to Western Sudan by the Kunta Arabs who preached saint worship or *Sufism*, spiritual superiority of Islam, correctness of its law and the need for Islamic states. The Torodbe Fulani had great influence as scholars and clerics, serving as royal advisors and administrators. They disapproved of the prevailing religious laxity over Islam. They believed in *hijra* or flight from the holy land of non-believers and then a *jihad* (holy war) to extend the realm of Islam.

In the 18th century AD, Fulani *jihads* extended outwards from established small-scale Islamic theocracies in the Fouta Toro and Fouta Djallon, their influence being strong even to this day. Fulani from Macina moved into the temperate highlands of the Fouta Djallon (Fouta Jalon), which had been home to animist Mandinka and Susu, taking over through a *jihad* under Ibrahim Mousa, which lasted from 1725 to 1776 AD when Ibrahim Sori established a Muslim government. In 1775 AD, a Muslim theocracy was founded along the Senegal River or Fouta Toro, as Torodbe Fulani under Suliman Bal overthrew animist Fulani Denyanke rulers installing Abd al-Qadir as their leader. While these Islamic states proved unstable, they set a precedent across Western Sudan of

theocratic governments controlled by Muslim scholars and the conversion of the masses to Islam (July, 1970).

1.4.5.1 Fulani takeover of Hausaland

For several centuries, the Fulani lived peacefully in the Hausa states: the Fulani Gida in towns and Bororoje pastoralists in rural areas. The fundamentalist Fulani clerics, however, became increasingly disillusioned with the population's casual approach to Islam and saw themselves as a separate minority. The animist Fulani pastoralists and Hausa farmers, on the other hand, were upset by what they considered to be unjust taxation and corruption by the Hausa government, all of this leading to an unstable situation by the end of the 18th century AD. This resulted in the Sokoto *jihad* led by the religious reformer Usman dan Fodio and the take-over of the Hausa states in a few years: Kebbi in 1805 AD, Zaria in 1806 AD, Kano and Katsina in 1807 AD and Gobir in 1808 AD. Hausaland was consequently divided into two: Gwandu under the administration of Abdullahi, Usman dan Fodio's brother, and Sokoto under Muhammad Bello, the Sultan of Sokoto, Usman's son. Government was introduced along the lines of "*Shari'a/Shariah/Sharia*" (Islamic law) and Sokoto became a center for Islamic scholars (July, 1970).

Eventually, the idea of a Fulani empire eclipsed the idea of a world under Islam, which resulted in needless slaughter and plunder, as well as appointment of Fulani to most government posts. This move alienated the Hausa community. Slaves were a major part of the economy as both an item of exchange and for agricultural labor (July, 1970). In the 1830s AD, the Fulani (Fulb  ) conquered Adamoua (Adamawa) in the northwestern highlands of Cameroon (Giles-Vernick, 2002). Under Fulani rule, private individuals had over 1,000 slaves with provincial governors having many times more (July, 1970). This had ramifications all the

way into the tropical lowland forests of the Sangha River Basin, southeast of the Adamoua (Adamawa) Plateau, as various ethnic groups centralized political control, fled and entered into a permanent state of warfare over resources and slavery (Giles-Vernick, 2002). Eventually, under Bello, the Fulani Empire extended west to Adamawa and south to Yourabaland, an area that by 1837 AD covered much of what is today's northern Nigeria (July, 1970).

The empire remained intact into the beginning of the 20th century AD, when it was taken over by the British. The emirates, which succeeded the Habe Kingdoms of Hausaland, were bound to Sokoto through religious allegiance. While in certain states there was peace, others never completely accepted Fulani rule, with the Hausa language, culture and administration remaining largely intact. The area became an important center of commerce across Africa known for its Kano cloth, leather products such as sandals, kola nuts and slaves (July, 1970).

1.4.5.2 Seku Ahmadu Bari, Macina/Segu

Macina, just upstream from Timbuktu, in the early 19th century AD was similar to Hausaland with a Muslim ruler reigning over mostly animist Fulani pastoralists, Soninke, and Songhai. The Muslim state of Macina was a vassal to the animist Bambara state of Segu and its controlling Dyalo clan was in conflict with the Sangare family. In 1818 AD, a jihad by *Seku* (chief) Ahmadu Bari of the Sangare family created a theocratic state, which included the Muslim centers of Djenné (Jenne) and Timbuktu. Pastoral Fulani and many Bambara were converted to Islam. This state proved to be unstable as there were various Muslim ethnic (e.g., Soninke, Fulani and Arab) rivalries and different views on Islam (e.g., no spirits, drinking or dancing in the extreme). This resulted in a number of civil wars with Muslims fighting each other (July, 1970).

1.4.5.3 El Hadj (Haji) Omar, the armed profit (*prophète armé*)

El Hadj Omar, the son of a Muslim scholar, was a Toucouleur (Tokolor/Fulani) warrior from the Futa Toro of the Senegal River, who had spent time in Mecca and Cairo. While in Mecca, he joined the Tijani brotherhood, becoming both the *moquadem* (delegate) and *Khalifa*, head or supreme commander of this sect in western Sudan (July, 1970; Ducoudray, 1984). A major difference between the Quadrya sect, originating from Algeria, and the Tijani sect was that among the Tijani a commoner had direct access to El Hadj Omar and one's rank depended upon ones skills and courage, and not social origins as among the Quadrya (Ducoudray, 1984). He spent nine years in the Fouta Djallon from about 1838, preparing an army (*zaouiah*) grounded in Tijani doctrine, which operated out of Dinguiray, where he launched his *jihad* in 1852 with black powder muskets obtained by trading with coastal areas (July, 1970; Ducoudray, 1984).

In Dinguiray, he built a fortress with three walls, an outer wall of four meters in height, a second inner wall 50 meters away six meters high with turrets, and a third inner wall guarding the *Donyntutu* or house of the *cheikh* (*sheikh*) (Ducoudray, 1984). He practiced a scorched earth policy if anyone dared resist his army and their conversion to Islam, leveling villages, killing all males and taking women and children hostage as slaves (Ducoudray, 1984). El Hadj Omar took control of Bambara and Mandinka states in the upper Niger and Senegal River Basins, and eventually the Fouta Toro (Senegal River Valley) where the Toucouleur supported him and where he made his first contact with French (*Toubabs/Pink Ears*) commercial interests moving up river from Saint Louis on the coast. The French *commercants* refused to ally themselves with El Hadj Omar by selling him arms. In 1857 at the battle for the French Fort of Medine, upstream from present-day Bakel on the Senegal River (see Chapter 7, Figure 7.2: Dams in

the Senegal River Basin), his army was repulsed. About 600 *talibés* (disciples) were killed by the French using superior canon fire from a gunboat while employing the now celebrated corps of African riflemen, *Tirailleurs Senegalais* under Governor of Senegal, Louis Faidherbe. After this contact with the French, El Hadj Omar made a decision to avoid them at all costs, turning his attention east of the Senegal River (July, 1970; Ducoudray, 1984). He took the Bambara states of Kaarta (Karta) in 1854 AD and the Fulani state of Segu in 1862 AD, arguing that Ahmadu Bari III had allied himself with the infidels of Segu against the true believers (July, 1970). El Hadj Omar's empire stretched from Dinguiray in the Fouta Djallon Mountains of Guinea-Conakry north to the Sahara, west to the Senegal River and east to Timbuktu (Ducoudray, 1984). His Toucouleur Empire was fragile, something which first became apparent in Macina where Qadiriya Muslims revolted against Tijani doctrines. This resulted in his death in 1864 AD. Thereafter the Toucouleur Empire was barely held together by his son Ahmadu, finally coming under control of the French military in 1893. El Hadj Omar's legacy was not an empire, but instead the widespread conversion of West Africans to Islam and the dominance of the Tijani sect (July, 1970), a major force in West Africa even in the 21st century AD.

1.4.5.4 Samouri Touré, Dioula (Dyula) Mandinka

The Dioula Mandinka developed a commercial empire linking the forest and savanna, in the 19th century AD. Small states, such as Kong (Diaghanké ethnic group related to the Mandinka) and Odienne, were established in the southern part of “Western” Sudan. Trade consisted of salt, kola nuts and slaves. Beginning around 1865, Samouri Touré, the son of a *commercant* (merchant), who had been raised as an animist, adopted Islam and unified warring factions in Mandinka country thereby creating a state between the forest and the Toucouleur Empire of El Hadj Omar. This occurred just at the time when French expansionism began

taking place, the latter envisioning a territory from the Atlantic to the Red Sea. Samouri Touré traded with British Freetown for arms and with the Sahara for horses, using slaves as his main barter. In the 1880s AD, while the French were preoccupied with the Toucouleur state established by El Hadj Omar and now under the control of his son Ahmadu, Samouri courted the British to offset the French in his territory of the upper Niger Basin south of Dinguiray in what is today's Guinea-Conakry. He waged a brilliant guerrilla war against the French, which they believed would last two weeks but went on for over seven years and which was based upon leaving behind a scorched earth of villages in ruins, but only after his followers had re-established themselves elsewhere with government and armies intact. In the Mandinka culture, the mother and sister are worshiped almost as a cult. Samouri became a prisoner to save his mother in 1898, dying two years later as an exile in Gabon. Although, he enforced the spread of Islam, he is regarded more as a political than religious figure who tried to create a Mandinka state in the face Of French expansionism (July, 1970). All in all, it can be said that the Mandinka culture has left its mark in the West African countries of the Ivory Coast, Mali, Guinea-Conakry, Senegal, the Gambia, Sierra Leone and Liberia. This is especially observable in terms of art, music, griots (oral historians) and commerce, while the warrior qualities of the past have almost disappeared (see "Dozo", Section 1.4.2.1, Sundjata (Sundiata) Keita and Chapter 2, CHAPTER 2: TRADITIONAL NATURAL RESOURCE UTILIZATION MANAGEMENT and Chapter 9, Section 9.8.9, *Gestion des Terroirs*, West Africa).

1.4.6 The Mossi Empire

The Mossi population numbered 1.5 million people at the beginning of the 20th century AD, thereby representing one of the larger homogenous ethnic groups in West Africa. The population extends from the Inner Delta *Boucle du Niger* well

into modern Burkina Faso. The Mossi people are originally believed to have come from modern Ghana. With their headquarters in what is modern-day Ouagadougou (capital of Burkina Faso), they conquered Timbuktou (Timbuktu) by making use of “masters of the sword and masters of the bow” in the 14th century AD. Askia Mohamed of the Songhai tried to convert the Mossi to Islam but they refused, which led to a *jihad* against them. Like much of West Africa, the cities became Muslim but the majority of the rural people remained animist. By the 15th century AD autonomous Mossi kingdoms appeared. By 1757 AD, Naaba Kango returned after three years in exile from Segou (Segu) and Kong and armed Bambara mercenaries retook control of the Yatenga Kingdom that had sent him into exile. *Naaba* Kango refused to undergo the coronation process, thereby excluding his heirs from the throne. Internal conflict over succession resulted in the French taking control of the kingdom in 1894/95 AD. Neither colonization, when the empire became Upper Volta, nor independence, when its name changed to Burkina Faso would destroy the power of the *Naba*, descendants of the original founder in the 15th century AD. This was due to solidarity at all levels of society, from the military and administration to the culture (Kake, 1983).

The army with its infantry and a horse cavalry using lances and poisoned arrows was renowned throughout western Sudan. Administratively, there were both elected officials and royalty. The entire country was under control of the *Moro Naaba* (king). Under him were provincial chiefs that were semi-independent vassals. Provinces were divided into cantons, each formed by a certain number of villages, each village having a *naaba* or local chief. There was a strict chain of command. The *Moro Naaba* made no decisions without advice from provincial chiefs, while they never gave a command directly to a village, as this was the role of the canton chief. By the end of the 19th century AD, the administrative system began to fall apart due to the fact that the *Moro Naaba* was paralyzed by an entourage of excess such as *soronés*, young pages who surrounded the king,

eunuchs, who had been repeat criminals, an Islamic advisor (*Imam*) and a military advisor/head of the army (*Ten'soba*). Even today, a *Moro Naaba* is still present as a symbol of the Mossi past (Kake, 1983).

1.4.7 Wolof (Djolof) Empire

The Wolof are known today as the traders of West Africa, whose language or commerce follows them. The well known Cheikh Anta Diop places their origins as the upper Nile Basin (Diop, 1974; Kake, 1983). Traditionally, Wolof were found in a territory bordered by the Atlantic Ocean to the west, the Gambia River to the south, the Falémé River to the east and the Senegal River to the north. Their territory was divided into six areas; the Wolo in the north along the Senegal River Valley, Cayor in the West, the Sine and Saloum in the South, Baol and Djolof. The Wolof Empire peaked in the 15th century AD and ended in the 19th century AD with the arrival of the French (Kake, 1983).

The Wolof had a society of elite and castes. The basis of society was the family. The *Dyambour* or *Gore* were the “free people”, including the *Dmoibour* (nobility) and the *Badolo* (proletarian). The captive or slave caste was the *Yoro Dyao/Gnegno*. The system has been described as feudal with royalty, serfs and slaves (Kake, 1983). Additional caste groups included story telling *griots* and *tyeddo* (soldiers) (July, 1970).

The founder of the Wolof Empire was N'Dyadyane N'Dyane, whose empire lasted until the 16th century AD – about 1566 AD, when 5 of the above areas became semi-autonomous vassal states of the Djolof Empire. The Wolo was annexed by the French administrator, Faidherbe, in 1855 (Kake, 1983).

Cayor had a ruler (*damel*) chosen by election who became the master of the soil. Cayor was confronted with 400 years of civil wars and turbulence with neighboring states. In Cayor, *tyeddo* (soldiers) were chosen from royal slavery, giving them power to make and unmake kings. By the middle of the 19th century AD, the animist *tyeddo* were plundering the rural Muslim farmers. The last *damel* was the famous Lat Dior (Kake, 1983), a hero depicted in statues and paintings on his reared horse ready to fight the French. For nearly 25 years, Lat-Dior, the *damel* from 1862-1886, was able to hold off the French, who wished to connect Dakar with Saint Louis to produce groundnuts (peanuts). His ultimate downfall was his conversion to Islam and loss of support by the animist *tyeddo* that allowed the French to defeat him, resulting in his death (July, 1970). The end of traditional rule opened the door for the take over of Senegal by marabouts holy leaders such as the Qadiri *marabout* Chiekh Ahmadou Bamba, founder of the Mouride Brotherhood, and the Tijani *marabout* El Hadji Malick Sy (Hemenway, 1996) (see Chapter 3, Section 3.1.4.1, Francophone colonial Africa, Indirect Rule in Senegal and Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal).

1.4.8 Slave Kingdoms – Dahomey and Ashanti

Pre-colonial empires such as Dahomey and Ashanti (located in what is now Benin and Ghana), where slave ports, respectively, at Ouidah and Elmina flourished, accumulated enormous wealth and power from trade of their fellow Africans. This area of West Africa is also the place of origin of *vodou*, the only indigenous African religion to survive the trans-Atlantic slave trade and remain in practice in the Americas today (Antrim, 2002).

In fact, Europeans often acted as junior partners to African rulers, merchants, and middlemen in the slave trade along the West African coast from the mid-15th century AD onwards. Two factors contributed to this dependency: the coastal geography (rough seas and few good ports) and the diseases of West Africa. European ships anchored well away from shore and depended on skilled African canoe-men whose ability to negotiate across the hazardous stretch of water between the mainland and the waiting ships made the Atlantic trade possible. Malaria, dysentery, yellow fever, and other diseases reduced the few Europeans living and trading along the West African coast to a chronic state of ill health and earned Africa the name of *white man's grave* (Antrim, 2002).

When Europeans first initiated a trading relationship with West Africans in the mid-15th century AD, they encountered well established and highly developed political organizations and competitive regional commercial networks. Europeans relied heavily on the African rulers and mercantile classes to gain access to the commodities they desired. European military technology was not effective enough to allow access by force until the 19th century AD. Therefore, it was African coastal rulers and merchants who controlled the means of coastal and river navigation and to whose advantage the Atlantic trade was conducted (Antrim, 2002).

Domestic and international (e.g., trans-Saharan) slave trade in Western Africa preceded the late 15th-century AD origins of the Atlantic slave trade. Since most West African societies did not recognize private property in land, slaves were one of the only profitable means of production individuals could own. West Africans acquired and expressed wealth in terms of dependent people, whether as kin, clients, or slaves (Antrim, 2002).

Well before the arrival of Europeans, slaves were traded along trans-Saharan caravan routes, linking Sub-Saharan (SSA) Africa with North Africa, the Mediterranean and the Middle East. African rulers and merchants were thus able to tap into pre-existing methods and networks of enslavement. Enslavement was most often a byproduct of local warfare, kidnapping, or the manipulation of religious and judicial institutions. Military, political, and religious authority within West Africa determined who controlled access to the Atlantic slave trade. African elites in the Dahomey and Ashanti empires used this authority by enslaving and selling other Africans to European traders (Antrim, 2002).

1.4.8.1 Ashanti (Asante) Kingdom, modern-day Ghana

Between the 11th and 13th centuries AD, Twi and Akan speaking people emigrated from the drying savanna of the north, mixed with the people of the forests and established small village communities or trading states such as Wassa, Sefwi, Denkyirs, Ashante, Assin and Fante. By the early 15th century AD, trade with the northern caravan trading centers of Djenné, Timbuktu and Hausaland included salt, gold, kola nuts and slaves from the forest. By the end of the 15th century AD, an Atlantic trade developed with the Portuguese; chiefly in exchanging gold for firearms. The area became known as the Gold Coast and by the 17th century AD Dutch, British and Danish interests had established trading posts, while French and Portuguese ships stopped in for trade (July, 1970). The Ashanti (Asante) were the dominant ethnic group of a powerful 19th century AD empire and are today one of Ghana's leading ethnic groups, with more than 2 million members concentrated in south-central Ghana. The political, military, and spiritual foundations of the Ashanti nation date to the first Ashanti king, Osei Tutu who forged the Ashanti Union by bringing together several subgroups from roughly 1670 AD to the 1690s AD. He also built a capital, Kumasi; created the legend of the Golden Stool to legitimize his rule and began celebrating the *Odwira*, or yam

festival, as a symbol of national unity. Over the course of the 18th century AD, the Ashanti conquered most of the surrounding peoples (July, 1970; Antrim, 2002). The King of Kumasi was known as the *asantehene* (head of the Ashanti state), with kings of neighboring states serving as commanders of the national army and forming a council of advisors. Under military exploits, the Ashanti Kingdom rapidly expanded due to the desire of the inland people to break through to the coast and take direct part in the Atlantic trade, as well as the desire for firearms from this trade that would provide authority to the Ashanti economic and political aspirations (July, 1970).

By the early 19th century AD, Ashanti territory covered nearly all of modern Ghana, including the coast, where the Ashanti could trade directly with the British. Their empire stretched 388,500 km² (150,000 mi²). Hereditary chiefs were replaced by a bureaucracy subject to royal appointment and control, while provinces were ruled by proconsuls under royal control. A national treasury was established, which was in charge of tolls and taxes, a state controlled trading company and state controlled mines gave rise to a complex centralized bureaucratic state unusual among West African societies (July, 1970). As the Ashanti people prospered, Ashanti culture flourished. They became famous for gold and brass craftsmanship, woodcarving, furniture, and brightly colored woven cloth, called *kente*. The Ashanti maintained traditional beliefs, with a few converting to Islam and Christianity. During the 19th century AD, the Ashanti fought several wars with the British, who sought to eliminate the slave trade and expand their control in the region. The Ashanti kingdom was finally declared a Crown Colony in 1902 AD following the uprising known as the *Yaa Asantewa* war (Antrim, 2002).

1.4.8.2 Kingdom of Dahomey, modern-day Benin

Dahomey, a pre-colonial West African kingdom, is located in what is now southern Benin (Antrim, 2002). Dahomey had maintained close connections to the city-states of the Yoruba and for a while was a vassal to the Oyo Empire of Yoruba between 1726 -1730 AD. Myth has that the Yoruba origins of its founder were ancient Egypt. It is believed that the Kingdom of Dahomey had its origins in self-defense against slave raiding by a number of coastal states. The Kingdom of Dahomey was unified under King Agaja in the 1720s AD signing a peace accord with the Kingdom of Oyo permitting King Agaja to retain an army and internal self-government under a resented Oyo suzerainty. Independence from a failing Oyo Kingdom was not obtained until 1822 (July, 1970). Dahomey reached the height of its power and prestige during the heyday of the Atlantic slave trade in the 18th and 19th centuries AD (Antrim, 2002) (see Chapter 3, Section 3.1.7.2, Cultural genocide). Slavery was a state monopoly, with the two administrative posts of *mehu* and *yovogan* directing national trade and financing, including trade in slaves (July, 1970). The kingdom was also known for its rich ivory carvings and lost-wax castings in bronze and brass (Martin & O'Meara, 1995). Dahomey became heavily involved in the European slave trade with the arrival of the Dutch (Antrim, 2002). The end of the slave trade in the mid-19th century AD greatly affected the economic fortunes of Dahomey, forcing it to provide primary products for newly important colonial markets. Palm oil, its main export, never generated the same revenues as had the slave trade. After the French gained control of Porto-Novo, commerce declined. In 1892 AD, the French launched a full-scale offensive against Dahomey; its leaders surrendering in 1894 AD, with the kingdom becoming a French colony (Antrim, 2002).

1.5 HORN OF AFRICA - ANCIENT ABYSSINIA (MODERN ETHIOPIA)

1.5.1 Sabaean

At least by 1,000 BC at the latest, Ethiopia, Eritrea and what is now southern Yemen were part of a large empire known as the Sabaean Kingdoms. The earliest known Arabian temple was at Marib (in southern Yemen), capital of Saba (Sheba), and was called Mahram Bilqus, *precincts of the Queen of Saba* or *Makedda* (greatness). Saba had a very matrifocal society with a host of female deities. According to the *Kebra Negast*, a holy book of Ethiopia, it is said that “*Makedda*” (Greatness) herself created a dictate stating, *only a woman can rule*. Polyandry, the practice of taking more than one husband by a woman, and tracing one's kinship based on matrilineal descent was common. Years later, the Jewish historian Josephus, referred to her as *Nikaulis*, *Queen of Ethiopia*. She is the celebrated Queen of Sheba of the Bible who is described as *black and comely* (The Sankofa Project, 1999). Likewise, Diop (1974) considered the Sabaean Kingdom to be dominated by a black culture. According to Diop (1974), at the time, what is modern-day Yemen was a Negro Ethiopian colony, remaining so until the birth of Mohammed in 570 AD, when the black and white races mixed to form Semites that today constitute both Arabs and Jews.

Saba flourished as a trading community in goods from Asia as well as Africa. Even coffee drinkers trace the original cup to Ethiopia's Kefa region. Saba was a center of astronomical wisdom. In Saba the Queen or King was chief astronomer and astrologer. Spiritual religious life involved reverence of celestial bodies such as the sun and moon (The Sankofa Project, 1999).

1.5.2 Aksum

The eastern horn of Africa had been well known during dynastic Egypt as the land of Punt. Roman and Greek sources indicate that an Aksumite (Axumite) kingdom (Figure 1.1) was thriving by the first century AD, the city of Adulis being an important port city. Ethiopian history, however, places Aksum as an ancient city, and the home of the Queen of Sheba at around the first century AD. In the second century AD, Aksum acquired tribute states on the Arabian Peninsula across the Red Sea, conquered northern Ethiopia, and then finally conquered Meroitic Kush (Figure 1.1). The downfall of the Nubian powers led to the swift rise of Aksumite imperial power. The Aksumites controlled one of the most important trade routes and occupied one of the most fertile regions in the world (see Chapter 2, Section 2.3.4.1, Aksum of Ethiopia). Aksum lay directly in the path of the growing commercial trade routes between Africa, Arabia, and India and became fabulously wealthy. Its major cities, Adulis, Aksum, and Matara, were among the most important cosmopolitan centers in the ancient world. An indication of this cosmopolitan character can be found in the fact that the major Aksumite cities had Jewish, Nubian, Christian, and even Buddhist minorities (The Sankofa Project, 1999).

1.5.3 Christian Ethiopia

By the fourth century AD, the religious system of Christian Rome had conquered Egypt and Syria. During the reign of King Ella Amida, he converted to Christianity, which became Ethiopia's state religion. Coptic Christianity flourished in the Nubian kingdoms mostly among the royalty and the monks (The Sankofa Project, 1999).

Muslim conquests in the mid-seventh century AD of Egypt and North Africa left Aksum cutoff from former trade routes. Although Ethiopian tradition indicates that the kings of Ethiopia are of Judaic stock directly descended from Solomon and the Queen of Sheba, Christianity was introduced through mercantile relations. However, with the Muslim takeover of the Red Sea ports and northern Africa, the Christian faith was gradually naturalized and adapted to local conditions. Greek was no longer spoken, minted currency became rare, church construction ceased and pagan worship was revived. Although the strength of Aksum declined, its culture survived to form part of the Ethiopian civilization. The Ethiopian people were born of a fusion of semitized Aksumites and Cushitic¹⁰ highland peasant farmers (July, 1970).

During the ninth century AD, ancient Ethiopia managed to regain control of its Red Sea outlets, maintaining a prevailing southern orientation (July, 1970). As elsewhere, it was surrounded by Muslims. The Aksumites gradually migrated to the mountain districts of Amhara, Gojjam and Shoa, establishing kingdoms in the face of hostile pagans, which resulted in a late tenth century AD revolt of the Agau people who slaughtered the clergy. The Christian monarchy prevailed and thus a nation emerged based on a fusion as opposed to a conquest, with the Christian Aksumites forming the Abyssinian aristocracy, while Ge'ez and Amharic dominated the national languages. The Agau yielded to Christianity by having their religious practices (a combination of Judaism and paganism) integrated into church ritual. At the same time, the Agau emerged as the major ethnic element of the Abyssinian population and eventually gained control of the monarchy in the form of the Christianized Zagwe dynasty that ruled Ethiopia for 150 years from the middle of the 12th century AD. Eleven major churches were built, which represented the emergence of a unique Christianity of Ethiopia following Coptic linkages to the patriarch of Alexandria, Egypt, and close ties

¹⁰ Diop (1974) considered the Kushites (Cushites) to be black.

between the church and the state. Ethnically, the Agau were Semites from Arabia. By 1270 AD, the Solomonid (King of Solomon) line was restored to power and ruled Ethiopia until recent times. In the mid-1400s AD, this dynasty began establishing relationships with Rome as a means of holding back the external influences of Islam. In 1494 AD, Portugal made its first contact with Ethiopia and sent a diplomatic mission 25 years later (July, 1970).

Under pressure from their northern Muslim neighbors, the tributary states (e.g. Ifat, Fatajar, Doaro, Bali and Adal) fell one by one to Islam (July, 1970). This is significant as for centuries to come the greatest threat to Ethiopia would be their Muslim neighbors to the north (The Sankofa Project, 1999). In 1529 AD a powerful army from the Muslim state of Adal under Ahmad ibn Ghazi fought a *jihad* against the infidel Ethiopian emperor Lebna Dengel and defeated him, thereby bringing most of Ethiopia under Muslim rule, laying waste to large areas, destroying much of the artistic and intellectual heritage, converting many people to Islam and forcing the emperor into exile. With the help of 400 Portuguese musketeers, the emperor's successor, his son Galawdewos (1540-1599 AD) defeated the Muslims and killed Ahmad in 1541 AD. This was immediately followed by the invasion of pastoral Cushitic speaking Galla in the mid 1500s AD, forcing the Ethiopians to share their country with these invaders, living side by side for centuries, as strangers and potential enemies. Turks then invaded coastal areas, which the Ethiopians were able to neutralize but not eliminate in 1589 AD. In the early 1600s AD, Portuguese priests came to convert Ethiopians to Roman Catholicism, which resulted in bloody rebellion. The Ethiopian Church was restored in 1632 AD. All of these incursions resulted in Ethiopia withdrawing into xenophobia, while unrelenting pressure from the Galla led to internal decay, fragmentation and collapse of central authority.

The emperor Fasiladas (1632-1667 AD) established a capital at Gondar, an inaccessible retreat in the Amhara Mountains divorcing emperors from their people, while using Galla mercenaries to prop them up. This alienated the emperor from local princes (*ras*). In 1755 AD, a half-Galla king took the throne, which consequently lost all authority. In 1840 AD, civil war resulted in four independent provinces, Shoa, Gojjam, Amhara and Tigre. The isolation of the monarchy had allowed each provincial *ras* to establish his own local state protected by mountainous inaccessibility. This was followed by a period of anarchy and then forceful consolidation by the first of the reformer kings, Kassa. He was eventually crowned king of kings Theodore, *negusa nagast*, in 1855 AD. He attempted to create a unified modern state through administrative reform and a powerful army with modern arms capable of standing up to European hegemony. After defeating both the Italians and then the Mahdist army of the Khalifa of Muslim Sudan, Theodore was mortally wounded and replaced by the Shoan king Menelik II as king of kings or Emperor of Ethiopia in 1889 AD. Emperor Menelik solicited European assistance in modernizing Ethiopia, but also recognized Europe, especially the Italians, French in Djibouti and the British as a threat to his empire's sovereignty. He founded Ethiopia's capital of Addis Ababa in 1886 AD, building roads and bridges, a postal service and telegraph/telephone services by the beginning of the 20th century. At his death in 1913 AD, Ethiopia went through a brief period of uncertainty under the reign of the apostate of Islam, Empress Lij Yasu (Jasu) from 1913-1916, followed by Menelik's daughter, Zauditu as Empress. Upon her death in 1930, the *Ras* Tafari was crowned Emperor Haile Selassie and would lead Ethiopia into the colonial era after being subjugated by the Italians in 1936 using methods counter to the League of Nations and then by the British during the early years of WWII in 1941 AD (July, 1970).

1.6 EASTERN SUDAN (MODERN-DAY SUDAN)

The 20th and 21st century AD conflicts of modern Sudan, with its capital in Khartoum, can be traced back to the 14th century AD.

When the Aksumite armies sacked Meroe, the capital of the Kingdom of Kush (Figure 1.1) in the middle of the fourth century AD, a Negroid group remained in the Nile Valley. These were the Nuba, whose language and culture came to dominate the Nile Valley south of Egypt. Martin and O'Meara (1995) believe that Kush may have been vulnerable to invasion due to environmental degradation from over-grazing and deforestation. By the sixth century AD, the Sudanese kingdoms of Nubia, Maqurra and Alwa had been converted to Christianity through the Empress Theodora of Byzantium. In 652 AD, Nubian archers stood off an attack by a Muslim army from Egypt, which resulted in a treaty between Muslim Egypt and Christian Sudan that lasted for 600 years. These Sudanese kingdoms traded slaves to the north. Christian Nubian civilization prospered along the Nile River with attractive churches, monasteries, gardens, vineyards and rich pasture. The Kingdom of Maqurra spread Christianity as far as Darfur of modern western Sudan. Alwa bred fine horses, camels and cattle. There were 400 churches by the 13th century AD. The arrival of Mamluk rulers (a caste of Turkish and other Asian slaves who seized power in the mid-13th century AD) in Egypt led to large-scale Arab immigration from that country, which resulted in the political collapse of Maqurra in the early 14th century AD. The Alwa were overrun by pastoral Egyptian Arabs by the 15th century AD. Civil war resulted until calm brought about by the Funj sultanate early in the 16th century AD. This opened the way for the spread of Islamic religion and civilization throughout eastern Sudan. Eventually, the Arab and local populations became one, while indigenous organizations gave way to Arab political organization, and Christianity and paganism were replaced by Islamic culture and religion. The

Funj sultanate founded its capital at Sennar on the Blue Nile about 300 km upstream from modern-day Khartoum. It remained in power for 300 years (early 1800s AD) until the invasion and conquest by Muhammad Ali, who originally arrived in Egypt with a troop of Albanian cavalry in support of resistance by the Ottomans (Turks) against the Napoleonic invasion of Egypt. He eventually founded a dynasty of foreign princes (July, 1990). Thus, the northern half of Sudan tended to be Arab and Muslim, while the southern tended to be animist and eventually Christian. Interventions by the British created a Christian stronghold/buffer zone against further advancement of Islam to the south. This will be discussed in more detail in Chapter 13, Section 13.10.1.6, Oil-scorched earth Sudan.

Nilotic pastoralists in the south had little structured government. Neither the Nuer nor Dinka had/have headmen. Among the Dinka, hereditary ritual specialists called “masters of the fishing spear” acted as mediators and used their powers to assure the success of armies made up of lineages called “people of the spear”. A professional mediator among the Nuer, the “leopard-skin chief”, was/is called in when there are disputes. Among the Nuer, if there was an infringement of rights, cattle were taken, or there was individual combat; clubs if within the same village/camps, spears if the dispute is between villages. Only the “leopard-skin chief” could stop warring between villages, namely by hoeing the ground to create a boundary that neither may cross. Feuds could end through the exchange of cattle or through marriage as forms of settlement. Disputes among the Anuak were talked out by headmen or elders with consensus based on a public discussion. If someone killed, the killer left the village until the anger was gone. Only the Shilluk recognized the superiority of an individual, the *Reth*, over the whole of the people, the final authority. The *Reth* was responsible for making sacrifices for rain, victory in war, and performed a rite of reconciliation in the case of blood feuds similar to the “leopard-skin chief”. In most of these pastoral

societies, major wars are/were fought over access to grazing grounds (Mair, 1977).

1.6.1 Southward Expansion of Pastoralism and Livestock into East and Southern Africa

Pastoralists may best be defined as people linked to a system of production who gain their livelihood primarily from the care of large herds by means of transhumance (movements of livestock depending on rainfall and grass/vegetational cover) in semi-arid open country savannas and grasslands where agriculture cannot easily be sustained. They tend to survive by harvesting wild grain, fishing, hunting and even practicing agriculture in good rainfall years (Smith, 1992). In certain cases, pastoralists move into sedentary farming areas during the dry season in a reciprocal relationship, exchanging field stubble as food for livestock in return for manure as a natural fertilizer. In such cases, grains can be obtained through barter.

On the other hand, Agro-pastoralists, while they may see themselves as herdsmen, tend to be more sedentary. However, grains tend to play a large role in their diet and their gardens may be more important to them production wise than their herds, even when animals may be their most valued possessions (Smith, 1992).

The progressive desiccation of the Sahara after about 6,000 years ago (4,000 BC) resulted in water shortages and the southward retreat of the tsetse belt opened up new grasslands to pastoralism in West Africa. Sudan south of the confluence of the Blue Nile and White Nile rivers would also have permitted the exploitation of grasslands of the Upper Nile and East Africa. It is suggested that the influence on Southern Sudan came from the central Sahara and not from Pharaonic Egypt. By 4,000 years ago (2,000 BC), pastoralism was found around Lake Turkana (Smith, 1992). Between 4,000 and 3,000 years ago (2,000 and 1,000 BC), herding

became established in southern Kenya and Tanzania (Martin & O'Meara, 1995). Vande weghe (2004) believes that dense moist forests from the slopes of the Rwenzori Mountains (Albertine rift of present-day western Uganda) to Lake Victoria (eastern boundary of present-day Uganda) prevented pastoralists from the north from penetrating into southern Uganda, Rwanda, Burundi and today's eastern Democratic Republic of Congo until about 3,800 years ago (1,800 BC), but more likely between 2,500 and 2,000 years ago (500 and 0 BC) when drying conditions resulted in fragmentation of this forest.

By the time iron-using Bantu agriculturalists arrived in East Africa around 2,100 years ago (100 BC), Nilotc pastoralists were well established in East Africa (Smith 1992). Nilotc pastoral tribes migrating southward included Karamojong, Tutsi, Hima, Huma and Luo in Uganda, Turkana, Nandi, Kipsigis, Maasai and Luo in Kenya, and Tutsi in Rwanda and Burundi. Government was minimal. Chrétien (2003) and Chua (2003) dispute the origins of Tutsi and Hima as Nilotc (see below), believing them to be Bantu in origin.

The Turkana believed in self-help and did not recognize mediators. Stock was taken by force if one was wronged. When fighting for one's rights, one relied on support from lineage groups and friends whose allegiance was won through gifts of cattle. The oldest men in the community were believed to have ties to the ancestors. The Kipsigis believed in blood feuds and the right to seize cattle (Mair, 1977).

West of Lake Turkana, the majority of the pastoralists are Nilotc. East of Lake Turkana, they are Cushitic-speaking divided into two mutually unintelligible linguistic sub-groups; Oram (spoken by Oromo and Borana) and Somaloid (spoken by Rendille and Somali). The Cushitic-speaking camel herding Rendille and Nilotc-speaking cattle herding Samburu have experienced exchange, co-

operation and intermarriage for a long time. Because camels breed slower than cattle, the Rendille were unable to maintain camel production at the same rate as human production and were forced into Samburu areas to become cattle herders, facilitated by the above relationships. What is unclear is the timing of arrival in East Africa (Kenya) of these Cushitic-speaking pastoralists; some sources see them as a second wave of pastoral immigrant following the arrival of the Nilotics, while others see them as pre-dating the arrival of the Nilotics by 2,500 years (Smith, 1992).

The iron-using Bantu lived and worked in wooded environments unavailable to the pastoralists and in an almost symbiotic relationship created grasslands through fire and bush clearance. In many cases, these cleared areas were gradually taken over by pastoralists. This interface between pastoralists and agriculturalists meant acceptance of economic activities across cultural boundaries. Smith (1992) suggests that the iron using cultures that appeared in the inter-lacustrine area around 2,000 years ago (\approx 0 AD) did not expand into the Kenya Highlands (e.g., Kikuyu farmers) until much later, probably due to the size of the pastoral populations that prevented invasions of their territory. July (1970) places the arrival of the Bantu into East Africa as around the first or second century AD. The Bantu, who had food storing capabilities moved into Tanzania, Malawi and Zambia around 1,800 years ago (\approx 200 AD) and the Highveld of South Africa around 1,600 BP (\approx 400 AD) (Smith, 1992). Livestock followed at a similar pace. It is hypothesized that as Bantu farmers cleared the bush, creating pasture and pushing back the tsetse fly belt, war-like pastoralists may have displaced these agro-pastoralists/agriculturalists, continually pushing these Bantu iron-using people southward (Smith, 1992).

Likewise, Vande weghe (2004) hypothesizes that unlike the western Bantus whose population densities remained low, the eastern Bantus' population, whose

agriculture was based on sorghum, finger millet and bananas, grew rapidly exceeding four persons/km² while advancing on a broad front with abandoned lands being taken over by pastoralists. In the case of Rwanda and Burundi, agriculturalists created high altitude grasslands where they had never existed, namely in cooler uplands (Vande weghe, 2004). These highlands were healthier for livestock and people, free of tsetse fly and mosquito vectors for sleeping sickness and malaria, respectively, allowing the populations of both to grow (Vande weghe, 2004; Diamond, 2005). Of course, this ended any possibility of these lands going back into forests, the situation which persists to the present day and which is continually worsening (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests - Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization).

It is believed that the most likely movement of livestock accompanying iron-using agro-pastoralists from East to Southern Africa took place in the inter-lacustrine area of East Africa, downward through the tsetse-free corridors of the Tanzanian Highlands and Malawi to Zimbabwe and the Transvaal of South Africa (Huffman, 1979; Phillipson, 1985 *In:* Smith, 1992). By the end of the first millennium BC, iron using Bantu had displaced hunter-gatherers south of the East African Highland zone in Central Tanzania (Smith, 1992). It is believed that the Bantu agro-pastoralists spread into lands occupied by hunter-gatherers (e.g., San) who were incorporated into agro-pastoral society as low-status members. Flocks of small stock (e.g., sheep) exchanged hands and many former hunters became herders in their own rights (e.g., Khoi of the Western Cape as early as 1,960 +/- 95 years ago (\approx first Century AD). From skeletal remains of Khoisan-speaking groups¹¹ in Zambia, and Malawi as late as the third century AD, it is suggested that southern Zambia and Malawi could have been part of a geographical area of conflict between Bantu and Khoisan peoples during this expansive period of food-

¹¹ Khoisan is a term used by linguists for groups speaking a click language

producing societies; however this possibility needs further research (Smith, 1992). Martin and O'Meara (1995) argue that the spread of herding and agriculture south of Tanzania was blocked for about 2,000 years, arguably due to the extremely successful hunter-gatherer adaptation of the Khoisan-speaking people of southern Africa. Although the Hadza and Sandawe hunter-gatherers of East Africa spoke a click language, neither can be shown to be related to each other nor to the Bushmen/Khoi languages of Southern Africa. Some sources even question how closely the Khoi/Khoikhoi/Hotentot and Bushmen languages are related (Smith, 1992) [see Section 1.7.3.1, Khoisan-speaking groups (click language)].

In the second half of the 19th century AD, the Maa-speaking people's (Maasai) southward movement along the Rift Valley was blocked by more powerful neighbors, turning them back and resulting in internecine conflicts called the Maasai Civil Wars. At the same time, the Turkana moved into their current region in northwestern Kenya. When the Europeans entered East Africa, these movements were still taking place (Martin & O'Meara, 1995).

1.7 BANTU AFRICA

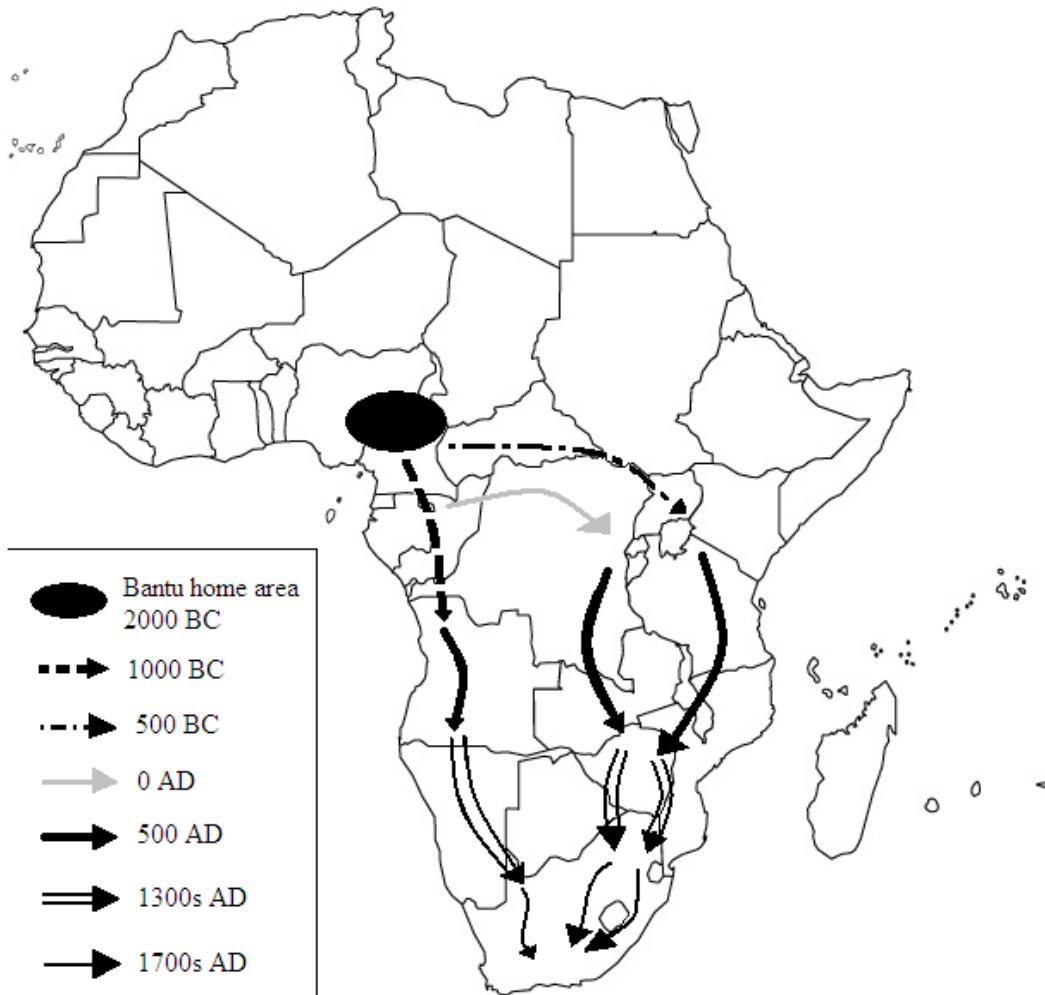
From 10,000 years ago (8,000 BC) to about, 6,000 years ago (4,000 BC) (Martin & O'Meara, 1995)/5,000 years ago (3,000 BC) (Chrétien, 2003) Africa experienced a long humid phase, significant for development in the Sahara. From about 4,000 to 3,000 years ago (second and first millennia BC) the continent began drying out from a combination of decreased rainfall and human land clearing/deforestation. By about 1,000 AD, this began forcing people to move in search of a more amicable climate, resulting in a southward agricultural movement (Chrétien, 2003). July (1970) places the beginning of the Bantu migration at about the time of Christ. Vande weghe (2004) places the migration

beginning about 5,000 years ago (3,000 BC) as the result of a drought that peaked somewhere between 2,000 to 3,000 years ago (1,000 BC to 0 AD).

- Bantu does not refer to one language but to a conglomeration of more than 450 (Kongo-Niger language group), whose origins can be traced to the cradle land where between the second and fourth centuries AD, Bantu speakers from western Cameroon (Adamoua Plateau of Cameroon) and eastern Nigeria spread southward (Martin & O'Meara, 1995; Vande weghe, 2004). July (1970) and Kake (1983) place the focal point of this migration at the central Bénoué River Valley coming off the Adamoua Plateau. The Bantu first spread through the forests and gradually into the savannas (Figure 1.4). They cultivated root crops, fished, hunted and kept goats. Their expansion was not militaristic, but a slow integration and absorption of other cultures (July, 1970; Martin & O'Meara, 1995). In less than 4,000 years they would colonize all of Central Africa and most of East and Southern Africa (Vande weghe, 2004), terminating their southerly movement at the Fish River of South Africa.

Vande weghe (2004) explains that this movement was split between the eastern and western Bantus. The western Bantus heading southward arrived along the coasts, watercourses and grasslands (Vande weghe, 2004):

- They arrived at the Sanaga River in present-day Cameroon about 4,000 years ago (BP) (2,000 BC).
- About 3,000 years ago (1,000 BC) they occupied most of the forests lying between the Atlantic Ocean and the great swamps of the central Congo Basin bordered by the Sangha River, Ubangi River and Congo River.
- By 2,000 years (0 AD) ago, they had gone around these swamps and reached the northeast part of the forest massif.



Source: Principal authors

Figure 1.4: Bantu migrations through Sub-Saharan Africa

By 1,500 years ago (500 AD) they had conquered all the Congo Basin and continued south to the Cunene River on the Angola/Namibian border, the middle Zambezi and the present Malawi/Zambia border.

The eastern Bantu migrated north of the great forests following a savanna route, reaching the Great Lakes region about 2,500 years ago (500 BC). From there some colonized the eastern part of the Congo Basin and the savannas just south of the forest massif, in East and Southern Africa. Ubangian and central Sudanian

peoples joined and were absorbed by the Bantus around the forest massif. South of the forest massif, western and eastern Bantus mingled (Vande weghe, 2004).

The history of the Bantu take over of East, Central and Southern Africa begins around the first or second century AD, the Bantu crossing the Limpopo River into what is now South Africa at between the 4th (July 1970)/5th (Smith, 1992) centuries AD and the 14th century AD (July, 1970), and ends with the most southern migration around the 18th century AD, somewhere between 1702 (Diamond, 1997) and the mid-1700s AD (Martin & O'Meara, 1995). The Xhosa clashed with the northern moving Afrikaner Boers and it took nine wars and 175 years for Boer armies advancing at a rate of less than 1.6 km (1 mile)/year to subdue the Xhosa (Diamond, 1997)¹². The southerly movement of the Bantu (Xhosa) was stopped at the Fish River by a lack of winter rainfall crops, which, however the Afrikaners brought in, thereby allowing them to settle in this temperate climate zone (see Section 1.1.5, Development of Modern Societies with an Agricultural Base).

July (1970) points to periodic explosive militaristic conquests, most likely due to land hunger, such as the sudden movement of Jaga into the Kongo and Angola in the late 16th century AD (late 1500s AD) from the African interior, the attacks by the Zimba from Malawi who devastated the East African coast and the early 19th century AD (early 1800s AD) population explosions in Southern Africa, which spurned the military conquests of Shaka Zulu.

According to Kake (1983), the Jaga and Zimba were basically the same group of people, whose origins can be linked to the Maasai or close relatives from the Great Lakes region. Similar to the Zulus, they were nomads made up of military companies instead of villages. The Jaga and Zimba used surprise attacks, killing

¹² Encyclopedia Britannica (2004) calls these the Cape Frontier Wars or Kaffir Wars lasting 100 years from 1779-1879

most of their victims except the women and young men, the latter being recruited for the military. In addition, they practiced cannibalism and infanticide. As the Jaga and Zimba moved through the Congo, they were absorbed into the Bantu culture, which they conquered and into which they married, thereby becoming *bantouisés*. Kake (1983) goes on to say that they helped the people they conquered, for example the Ba-Lunda, Ba-Bemba, Ba-Bisa, Ba-Yaka, Ba-Nano Ba-Songo and Ba-Rotse, with the formation of states. From the 16th–17th century AD, the Jaga and Zimba left behind a trail of fire and blood from Sierra Leone to the Zambezi and from Ethiopia to the Kalahari, but at the same time are considered the ancestors of the Ba-Yaka of the Congo, the Jinga of Angola, the Azimba of the Zambezi, the Vazimba of Madagascar, the Galla of Abyssinia, the Fundi of Sennar, the Timene of Sierra Leone, the Makalaka of Zimbabwe, the Pahouins and the Zulus.

Initially, the less agriculturally productive savanna areas were left vacant by the Bantu, while Nilotic-speaking (modern-day Sudan) and Cushitic-speaking (southern Ethiopia) people moved into these areas (see Section 1.6.1, Southward Expansion of Pastoralism and Livestock into East and Southern Africa). It is believed that the Cushitic and central Sudan-speaking people may have introduced the Bantu to dry cereal grains (although the Bantu would have brought certain varieties of sorghum and millet from the Sahel and yams from the Sudano regions), as well as irrigation and livestock (Martin & O'Meara, 1995). The Bantu did not move across East and Southern Africa in large numbers, but instead in small lineage groups. Their economy was based on “shifting cultivation” also called “slash and burn”, itinerant agriculture and *jachère* (see Chapter 2, Section 2.3.3, Fallow Agriculture in Low Productive Areas). As population pressures built up and nutrients were leached out of the soils, they were forced to move in search of new land (July, 1970; Martin & O'Meara, 1995). Bantu cultivation made possible a steadily growing population, which in turn acted as a propellant

for migration in response to issues related to marriage, inheritance, lineage and dissatisfaction with political or economic rights (July, 1970). While Martin and O'Meara (1995) call this a slow and gradual, not rapid process, July (1970) believes that a combination of soil exhaustion and population increases produced a rapid and dynamic migration. Likewise as noted in Section 1.6.1, Southward Expansion of Pastoralism and Livestock into East and Southern Africa, Smith (1992) suggests that as agriculturists cleared the bush, thereby pushing back the tsetse fly and its habitat, war-like pastoralists may have displaced these agro-pastoralists/agriculturalists, continually pushing the iron-using Bantu people southward (Smith, 1992).

Gradually the Bantu language dominated East and Southern Africa. It is believed this is because the Bantu were technologically superior compared to the pastoralists and the Khoisan hunter and gatherer. "Bantuization equaled urbanization" where the Bantu lived in compact settlements which other groups visited for trading purposes, and into which many of them were absorbed through marriage. As a result, many of these groups began speaking the Bantu languages (Martin & O'Meara, 1995).

Land hunger and habitat degradation has been and will continue to be a growing issue in the 21st century AD unless Sub-Saharan Africa and the global community address subsistence agriculture and transhumance. As described in this chapter and Chapter 2, these lifestyles can no longer sustain the majority of Africa's population. It will be necessary to train farmers to link traditional management systems to new technologies, while finding alternative livelihoods for the majority of the youth growing up in 21st century AD rural Africa. The reasons for the inability of the land to support 20th/21st century AD rural populations in Sub-Saharan Africa, as well as possible solutions to this problem are discussed thoroughly in Chapters 5 through 13.

1.7.1 Central Africa

1.7.1.1 Congo kingdoms

The people living in the Congo Forest did not have a highly centralized state like Great Zimbabwe to the south, being organized in small states or no states at all. Historians have suggested that organization consisted of small clearly defined geographical areas headed by a chief and a council of elders who led a number of villages, likely linked through kinship. The land was sparsely inhabited because of the density of the tropical rainforest. People were involved in both agricultural and hunting/gathering activities (ANON, 2002a).

By around 1400 AD, pastoralists had entered the savanna regions to the east and southeast of the forest. Some historians have speculated that through interaction between pastoralists and agriculturalists, institutionalized states were formed (ANON, 2002a), including the (Hempstone, 1962; Young, 2000):

- **Bakongo Kingdom.** In the mid-13th or 14th century AD, Kongo kings organized mostly matrilineal agricultural settlements, surrounding the mouth of the Congo River, into provinces, collected taxes, and established an official currency of shells.
- **Ndongo Kingdom.** South of the Bakongo people, in the early 16th century AD, the centralized Ndongo controlled the trade in salt and iron.
- **Baluba Kingdom.** The first great Bantu Kingdom, the Baluba Empire was founded in the 15th century AD by Kongolo Mukulu. At its apogee this empire, which lasted 200 years, was larger than Belgium, Holland and Luxembourg combined.
- **Lunda Kingdom.** Later in the 16th century AD, the Lunda formed a kingdom in the grasslands of the upper Kasai River (consisting of a

territory extending from modern-day Angola, Kasai province of the DRC south through present-day Katanga into northern Zambia), which began to eclipse the Baluba. The chief Mwata Yamo's kingdom was larger than the Baluba and at its peak was larger than Portugal. It became an arch enemy of the Baluba Kingdom.

The Bakongo Kingdom was once one of Africa's greatest empires, establishing diplomatic relations on a basis of equality with several European states. Its kings and courts were Christian and literate in Portuguese. It was one of the few African states to play a part in world history from medieval times almost until the present. The Bakongo lived on both sides of the Congo River. Their territory extended far into modern-day Angola to its eastern boundary with present-day DRC, the Kwango River. The center of the kingdom was the south bank of the Congo River (Figure 1.1). The political structure was similar to Europe in the Middle Ages with the country divided into districts run by vassal princes. They caste iron and copper, made bark cloth which the Portuguese traders used as sails, produced pottery and farmed with millet, bananas, peas, squash and yams. In 1484 AD, the Bakongo monarch, Nzinga Ntinu, sent ambassadors to Lisbon to request technical assistance in masonry, carpentry and religion. The king converted to Catholicism in 1484 AD and his son and successor Don Alfonso and eventually the king's grandson son Don Alvaro were made bishops. Ambassadors were sent to both Spain and the Vatican, and a Papal Nuncio was sent to reside in Mbanza. The Portuguese introduced the slave trade to supply Sao Tomé, Brazil and other New World communities, Don Alfonso being a principal supplier. The kingdom began to decline after being attacked by the Jaga tribe, the Portuguese coming to their defense in 1580 AD. However, in 1590 AD, the Bakongo declared war against the Portuguese under Don Alvaro II, while trying to have their kingdom placed under a Papal trusteeship for protection. This was followed by a short-lived takeover of Luanda by the Dutch in 1641 AD and a crushing

defeat by the Portuguese in 1665 AD at the battle of Mpika. Weakened by war and the slave trade, the Bakongo Kingdom saw a rapid decline, which by 1885 AD resulted in it being divided by the French, Belgians and Portuguese (Hempstone, 1962).

Both the Baluba and Lunda Kingdoms (Figure 1.1) depended upon military skill and political organization for their success (Hempstone, 1962). The Luba and Lunda Empires are believed to have had their center of development emanating from Lake Kisale (July, 1970) west of Mitwaba and on the northern border of the modern day *Parc National de l'Upemba* in what is now southeastern DRC.

The political unification of the Luba Empire was maintained by a hierarchy of chiefdoms, which served as an intermediary between the king and the village. Several villages formed a territorial chiefdom gathered into provinces combined to form a central state. With the exception of village headmen, all chiefs derived their power from the *balopwe*, members of the ruling lineage of Kongolo and his son Kalala Ilunga. Close relatives of the king held major titles in central government, including head of the army and police force. Expansion to the east and south brought on tributary states rather than provinces; conquering Lunda to the west in 1600 AD and consummated by the son of Kalala, Cibinda Ilunga marrying the Lunda queen to become king. He immediately divorced himself from the Luba Empire, creating his own independent state (July, 1970).

The Lunda Kingdom's (Figure 1.1) cohesiveness depended on the institution of perpetual kinship, which linked all village headmen to each other and to the king, with a new headman inheriting all his predecessor's kinship relations and his name. This resulted in local self-governance, the royal power refraining from interference in provincial affairs as long as taxes were paid. The king or *Mwata Ymvo* (Lord of the Viper) was represented by a district political officer, *cilool*,

nominated by local headsmen and acting as the tax collector. As with the Luba, the system of indirect rule in the provinces greatly diminished the authority of the Lunda king. The Lunda culture spread south and west into modern-day Zambia and Angola, as a result of breakaway groups deciding to form their own kingdoms, such as the Bisa and Bembe in Zambia and the Chokwe in southeastern DRC/Angola. The spread of this culture greatly influenced civilization in the Congo/Zambezi Basins until the 19th century AD (July, 1970).

The decline of the Lunda Empire at the end of the 17th century AD was brought about by two factors, the slave trade or export of “black ivory” by *pombieros* (half-caste Portuguese traders) from Angola taking slaves to the New World, and the supply of women to harems in Muscat and Oman by Arabs from the east. Both groups had firearms, at the time unavailable to these Bantu kingdoms. The 1885 AD revolt by the Chokwe tribe of hunters and warriors, formerly allied to the Lunda, resulted in the eclipse of the Lundas for 75 years (Hempstone, 1962).

Congo, Europe, Arabs, the Slave Trade and Devastation of Societies

Long before the conquest of the vast Congo hinterland, the coastal communities had had centuries of contact with Europeans. The area of the Congo was one of the principal sources of slaves to markets in Arabia, the Middle East and the New World. The slave trade had devastating effects on both Kongo and non-Kongo communities for almost 400 years. By the late 17th century AD, up to 15,000 slaves a year were sent out of the lower Congo River area (ANON, 1993). In the first half of the 19th century AD an estimated 7.5 million Congolese slaves, 150,000/year were shipped to the New World from West African ports (Hempstone, 1962).

The European slave traders were usually the final link in a chain of African and Arab merchants who brought slaves down to coastal trading posts. The slave trade in the eastern part of present-day DRC/Zaire was dominated by Arabs and continued until the late 19th century. All European nations had abolished the trade by the mid-19th century AD, and the end of the American Civil War in 1865 AD extinguished another main market. Besides obviously causing substantial depopulation, the slave trade in the Congo area also led to many local rebellions and increased ethnic warfare (ANON, 1993).

On the eve of the Belgian conquest in the late 19th century AD, Congolese societies had reached a degree of internal dislocation that greatly lessened their capacity to resist a full-scale invasion. The dynamics of internal fragmentation were directly linked to commercial activities. As the ownership of slaves became a major source of wealth and prestige, this in turn made it possible for the slave owners to challenge the authority of the king. Here, as elsewhere in the savanna, the competition for slaves introduced a major source of instability brought about by the divisions between “collaborators” and “resisters” and between the allies of the Arabs and the allies of the Europeans. This created a permanent state of social unrest and civil war and hampered African resistance to outside forces. The situation was exacerbated further by the subsequent improvement in the capacity of Africans to destroy each other through the use of firearms. In addition, a more enduring cleavage had emerged out of the varying exposure of Congolese societies to Western influences and early trade activities. The history of the old Kongo Kingdom encapsulates many of the crises experienced by several other states of the savanna in their efforts to cope with the challenge of the new economic forces (ANON, 1993).

1.7.1.2 Pygmies

Diop (1974) believes that the Pygmies were the first inhabitants of the African interior. Humans have inhabited the Congo Basin for at least 70,000 years. About 20,000 to 25,000 years ago, the first groups of humans began invading the forests; the offspring were the Pygmies. During this period, the Pygmies and tall blacks (Bantu, Ubangi and central Sudanic speaking peoples) diverged. Ranging from western Cameroon east to Uganda, Rwanda and Burundi, and showing some rare genes in common, the eastern and western Pygmies became separated from each other about 15,000 years ago. Their separation took place isolated during forest fragmentation of the last glaciation, and they never regained contact when the forests recovered. Three main ethnic groups developed among the Pygmies (Vande weghe, 2004):

- The Kola and Bongo in Cameroon and Gabon;
- The Aka, Baka (also in Cameroon), Asua, Mbuti and Efe north of the Congo River; and
- The Cwa south of the Congo River and Twa east in Kivu (DRC), Rwanda and Burundi

The fragmented distribution of an estimated 200,000 Pygmies scattered among 120 million blacks suggests that the Pygmy hunters were formerly widespread throughout the equatorial forests until displaced and isolated by arriving black farmers and compressed into the forests (Diamond, 1997). These refuges must have increased their isolation and accentuated their specialization (Vande weghe, 2004). The Pygmies did not have a distinct language, adopting that of the Bantus living in their vicinity (Diamond, 1997). This resulted in the formation of a master servant relationship between these two groups. Vande wege (2004) argues that the introduction of exotic crops such as banana, stimulated the growth of

farming populations and contributed to the Pygmies' dependence and eventual marginalization. In some areas, researchers have demonstrated that Pygmies are so dependent on starches provided by "black" farmers that they could never have survived on forest resources alone (Vande weghe, 2004), especially as their relatively small populations increased in relation to forest resources. Given the expulsion of Pygmies from their forests and the latter's decline as a result of logging and Western conservation movements at the beginning of the 21st century, the future of the Pygmy as a distinct culture is put into question [See Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the "*Dobi Dobi*", More Parks and Protected Areas and Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)].

1.7.2 East Africa

1.7.2.1 Great Lakes

The Great Lakes of Africa include Lake Victoria, Lake Albert, Lake Tanganyika, and Lake Nyasa (Malawi), which are all located in East Africa. The *Chewzi* stories are oral histories that have helped piece together the background of this region. Historians tie the concerns in the *Chewzi* stories to the time when pastoralists and agriculturalists were living side by side. Evidence shows that salt and iron trades existed during this period. Most historians believe that this region, like the Congo Forest, was ruled at a local level until around the 15th century AD when large states began to form. This was also the time when coexistence between pastoralists and agriculturalists started to become less peaceful and social classes or castes began to form among them (ANON, 2002a).

The introduction of Southeast Asian food crops, especially bananas, is believed to have allowed the movement from decentralized egalitarian communities that had

developed throughout East Africa to Bantu-speaking centralized states in the inter-lacustrine (between lakes) area. The largest of these states was Kitara, located in what is now southern Uganda and made up of Bantu-speakers known as “god-kings” called *Abatembuzi*. In the 14th century AD, this dynasty was supplanted by the *Abachwezi* dynasty, pastoralists from the north known today as the Tutsi of Rwanda and Burundi (Figure 1.1) (Martin & O’Meara, 1995; Madsen, 1999). Finally, around 1450 AD, the last group to move into the area were the Lwoo who supplanted the Abachwezi, causing the disintegration of the Kitara state into a number of smaller yet still highly centralized kingdoms such as the Bunyoro and Buganda (of modern-day Kampala), the Acholi Kingdom to the north and the Ja-Luo Kingdom, a tribe still found around Lake Victoria (Martin & O’Meara, 1995). Eventually six major kingdoms arose: 1) Buganda based mainly on banana growing in sub-montane forests along Lake Victoria, and in higher altitudes along the Albertine Rift, 2) Bunyoro, 3) Toro, 4) Ankole, 5) Rwanda and 6) Burundi (Vande weghe, 2004).

Both July (1970) and Madsen (1999) support the idea that Nilotic pastoralists moved into Uganda, Rwanda and Burundi. Mair (1977) provides an intermediate position, supporting the idea based upon language, that the Tutsi/Hima/Huma/Luo were Nilotic pastoralists, with Hutu and Iru being Bantu cultivators. The relationship between the two groups was more about divisions of labor than castes, with the caveat that the Hutu and Iru tended herds for the Tutsi/Hima. In some places in Uganda (Buha), the Tutsi cultivated and maintained cattle. Some intermarriage took place, basing one’s position in society on lineage and not physical appearance. A patron-client relationship appeared to exist between the Hutu and Tutsi of Rwanda, though this was voluntary. As a client, one could change patrons or have more than one and in fact even be given cattle, blurring the line of division between pastoralist and cultivator. In Uganda, the Iru could only own barren cattle. Mair (1977) speaks of a few instances where there were

Hutu chiefs, but claims this was rare. She also believes that while the Hutu followed armies into war, they did not fight and could not share in the booty.

Chrétien (2003) takes a more extreme view throwing into question much of the history about the Bantu migrations and the development of the Great Lakes region. There appears to be differing opinions as to the origins of the Bantu: Cameroon/Central Africa versus Katanga/Zambia, and as to whether they already had iron-making capabilities. The oral history of the Mbukushu of the Okavango Delta, Botswana states that their ancestors came from the area of Cameroon (Mangurunga, *pers. comm.*). Chrétien (2003) and Chua (2003) contend that Eurocentric beliefs of the existence of an inferior black Bantu race (e.g., the Hutu of Rwanda and Burundi, the Iru of Ankole, Uganda) dominated by superior white-in-origin (e.g., Nilo-Hamitic pastoralists such as the Tutsi of Rwanda and Burundi, and Hima of Ankole, Uganda) ethnic groups were racially based.

Chrétien's (2003) analysis of both Francophone and Anglophone archives leads him to conclude the following. The Hutu/Tutsi and Ira/Hima divisions were as much economic divisions of labor (e.g., farming for Hutu versus pastoralism for Tutsi) which impacted on diet, lifestyle and eventually also on physical characteristics. The idea of a Nilot or Hamitic invasion is questioned along with support for the concept of Bantu pastoralism in the Great Lakes region, similar to that in Bantu-speaking populations of Southern Africa, before 1000 AD. There was a collaborative relationship between pastoralist and farmer, one of providing manure to fertilize the fields and food in return. Similar divisions of labor are seen elsewhere in Africa such as among the Pokot of Kenya, a Nilot-Hamitic culture, where there are *pi pa tix* or cattle people and *pi pa pax* or corn people (Consolata Fathers, 1990). Diamond (2005) likewise raises the question as to whether the Hutu and Tutsi had different origins or whether they were different socio-economic groups within Rwanda and Burundi, a situation that was

exasperated by colonialism. He estimates that 25% of Rwandans have both Hutu and Tutsi grandparents and that both groups speak the same language.

Chrétien (2003) believes that a socio-economic cleavage within the Bantu community developed between largely agricultural groups and pastoral ones, each inhabiting a different ecological niche. This was exacerbated by droughts in the 1620s AD, 1720-1730 AD, 1750-1760 AD and 1780-1790 AD, after which the region was relatively free of ecological catastrophes until the 1890s AD (see Chapter 3, Section 3.1.8.1, Ecology of an empire in Tanganyika and Kenya). These droughts and resulting famines saw those with large cattle herds who were resource-mobile seeking out new lands, while the largely resource-immobile agriculturists developed pastoral dependencies as a means of survival, thereby solidifying the evolution of Tutsi and Hima elites in the Great Lakes region. However, the lines between pastoral elites and subservient agriculturists were not that clearly defined. Hutu versus Tutsi might be considered more of a status than ethnicity. Clearly, the notion of “Tutsi” lord and “Hutu” serf was not part of the ancient reality, despite the development of centralized authorities that by the 18th century AD began increasing privileges to Tutsi “pastoralists”. For example, in Burundi both Hutu and Tutsi chiefs were in charge of territories and managed royal land in the center of the country. In Rwanda clan membership prevailed over so-called ethnic membership, with clan lineage being important at a local level, while Hutu subservience to the superior Tutsi was designated at the socio-political level of the kingdom. However, in the 18 century AD Rwandan combined Hutu/Tutsi armies under control of “bow chiefs” became known as “bovine armies” and were allocated prestigious long-horned “Ankole” cattle. This contributed to the “fetishization of cattle” and a growing Hutu-Tutsi socio-political cleavage, which meant a division between groups whose lifestyle was more dominated by agriculture, though they might have some cattle, and those dominated more by livestock, though they might have some fields. Those “Hutu”

agriculturists who were promoted by the kingdom and gained wealth through livestock became “de-Hutuized”.

Colonialism would exacerbate this cleavage based on misunderstood racist interpretations that promoted the theory of a superior white-in-origin pastoral elite from the Horn of Africa destined to rule with European support. The creation of preferential education for a Tutsi minority and their institutionalization into a European-installed bureaucracy formalized and legitimized the unequal relationship between Hutu and Tutsi. This resulted in the creation of a neo-feudal structure, and the “racism” that contributed to the 1994 AD genocide in Rwanda and Burundi resulting in the deaths of over 1 million people, both Tutsi and Hutu, and the anarchy that still permeates from this region (Gourevitch, 1998; Chrétien, 2003) (see Chapter 13, Section 13.8.6, Former Cold War Allies Vying for Power in the Great Lakes Region).

There were two main rural systems in the pre-colonial Great Lakes area: 1) banana gardens and fisheries in the low riparian plateaus along Lake Victoria and the depression of Lake Tanganyika and 2) a mixture of cultivation and cattle herding in the western mountains of Rwanda, Burundi, southwest Uganda and the Kivu plateaus.

The banana tree, South Asian in origin, revolutionized agricultural production and spread into the Great Lakes region of Africa between 3,000 and 2,800 years ago (1,000 and 800 BC) from its entry point along the Zambezi valley and the Horn of Africa. The advantages of the banana tree were 1) simple propagation through cutting, 2) enabling year round farming and providing a year round source of food, 3) yields starting one and a half years after planting 4) flexibility in schedules and spacing of harvests, 5) ease of cooking, 6) use of leaves for roofing and matting, 7) providing green manure humus for gardens, thereby opening up

inter-cropping and 8) freeing up the male population for other pursuits such as hunting and fishing to provide protein (Chrétien, 2003).

A second agricultural revolution began between the 17th and 19th centuries AD with the arrival of New World sweet potato, cassava, maize and beans (e.g., *Phaseolus vulgaris*), groundnuts/peanuts in the dryer areas and tobacco from the Atlantic, supplanting traditional root crops such as *Vigna* legumes (Table 1.1). Maize and beans were already in place when the Europeans arrived in the mid-19th century AD, while cassava spread through colonial rule (Chrétien, 2003). A maize-bean revolution enabled the intensification of agriculture with two harvest seasons. According to Vande weghe (2004), the Zanzibaris-Arabs from Oman, who were heavily involved in the slave and ivory trade out of the Great Lakes region in the 19th century, introduced rice (*Oryza sativa*), mangoes (*Mangifera indica*) and the kapok tree (*Ceiba pentandra*). By 1894, the Zanzibaris-Arabs influence was over, defeated at war by the Belgians.

The success of agriculture accounts for the high human densities present in the Great Lakes region experienced today. It also freed up the male population for other activities such as war, commerce and hunting/fishing, helping the slow evolution from clans to allegiances. This lead from the development of 17th century AD kingships and their territorial expansion to the formation of monarchies in the 18th and 19th centuries AD, such as Rwanda and Burundi that by the late 1800s AD controlled 2 million inhabitants each. Today (2004/5), human populations in the highland areas (e.g., Rwanda and Burundi) have up to 200 people/km², while even a century ago, with a population four to five times smaller, the land was believed to be beyond its carrying capacity. This has resulted in some of the greatest deforestation anywhere in Africa with only a few forested pockets remaining on the highest mountain peaks (e.g., Virungas where some of the last mountain gorillas [*Gorilla gorilla beringei*] are found) (Chrétien,

2003). As is seen in subsequent chapters (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests - Rwanda, over-population and land degradation linked to deforestation for agriculture and political destabilization and Chapter 13, Section 13.8.6, Former Cold War Allies Vying for Power in the Great Lakes Region) population pressures and environmental degradation have worsened the Hutu/Tutsi cleavage in the 20th and 21st centuries AD.

1.7.2.2 Kikuyu of the Kenya Highlands

The Kikuyu Bantu culture remained as small village societies regulated by lineage and age groups, with no centralization into states, kingdoms or empires, but was still able to demonstrate strong political and social cohesion. The origins of the Kikuyu agricultural community of the Kenya Highlands appears to be from Shungwaya in southern Somalia. There were no chiefs. Unity was maintained through the family, clan, community and age group. Individual initiative was strongly discouraged in favor of the common good. The head of the family was the father (elder); there was a village and district councils of family heads and from the latter a national council of elders was chosen. In addition, the youth had a council, which also dealt with military affairs. This form of government was egalitarian with decisions based on group discussions. The age grade system was shared with the neighboring Maasai, with whom the Kikuyu traded, warred and sometimes intermarried (July, 1970) (see Chapter 3, Section 3.11.1, Population, Kikuyu and the Mau Mau and Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya).

1.7.2.3 City-states of East Africa - links to the Middle East

“As was true in Europe, Asia, and the Americas, not all African peoples lived in large kingdoms. There were a variety of social and political systems in Africa. In addition to the large kingdoms, there were smaller centralized political units, some of which historians call City-states since they were made up of large urban-like areas. These geographically smaller states shared much in common with the larger African kingdoms. The primary difference was size. The system and practice of governance that centralized power in the hands of a king and a supporting caste of political advisors and elites in these smaller kingdoms was similar to that of larger kingdoms. Moreover, control of trade and a strong military were also important factors in the development and maintenance of these smaller states. Oyo, Ife, Illorin, and Ibaban are examples of West African city-states. Sofala, Kilwa (Figure 1.1), Malindi, Mombasa, and Lamu are examples of East African city-states” (ANON, 2002a).

Arab geographers knew the coast of East Africa as the land of *Zinj* (July, 1970; ANON, 2002d), a word referring to the black colored natives' skin. Around the year 500 AD, the first Arab traders docked at this corner of the Indian Ocean and launched their long colonization process during which they introduced their culture, their mosques, their religion, and their bazaars.

It is believed that Arab trading posts at or near local African towns in time became Arab-Muslim kingdoms established over African royal houses, which slowly became Islamicized through the influence of Arab merchants (July, 1990).

“From the 9th century AD, cities like Pate, Lamu and Malindi were founded, giving rise to a new civilization, which was Bantu-Arab in origin but developed its own personality, including a new language. Swahili or Kiswahili was born as a blend of the Bantu grammar and the Arab vocabulary, and was initially written with Arab characters. The word Swahili appears to be a derivation of the plural of the Arab term Sahel (edge - of the Sahara), meaning, 'coast'. Centuries later, adapted to the Latin alphabet, it would

become the most widespread language in East Africa” (ANON, 2002d).

A major trading center in East Africa from the 12th century AD was Kilwa (Figure 1.1) (just south of Mafia Island and modern-day Lindi, Tanzania), which gained control of Sofala (off the mouth of the Zambezi River of modern-day Mozambique), linked to Great Zimbabwe (described below). Its control extended to Pemba Island off modern Tanzania and included Zanzibar and Mafia Islands. Between Kilwa and Mogadishu (Somalia) there were 40 coastal towns sustained by agriculture and commerce based primarily on ivory (e.g., island of Mombasa, Malindi, fortified islands of Pate and Lamu). In addition to ivory, timber, pitch and civet musk were exported, while imports included some foodstuff, some pottery and cloth. Slaves were not a commodity at this time. (July, 1970).

Eventually, the following developments took place:

“Traders found here fertile grounds for their business, exploiting the wealth of this virgin territory. The Arabs started organizing their caravans to the inner lands, capturing natives to be sold as slaves, giving birth to a form of trade that would thrive for centuries. The routes so defined by the Arab tradesmen would remain as the only paths inland that would even be used by the first European explorers who would arrive 100s of years later.

The maritime routes of this nascent commerce linked the East African coast with the Indies. Textiles and other manufactured products brought by sailors from the Arab countries, from India or China were exchanged for iron, ivory, gold or slaves, promoting this region to a flourishing development that would persist without interference until the arrival of the Portuguese ships. The Persians, who arrived in the coast pushed by the monsoon winds in their lateen dhows, also used these commercial flows. In the 14th century AD, the Persian traders founded the city of Mombasa. The Chinese and the Malaysians visited these shores as well, using the routes established in this golden age of East Africa” (ANON, 2002d).

In a few short years, from 1502-1509 AD, the Portuguese subjugated the coastal city-states of East Africa: Kilwa in 1502 AD, Zanzibar in 1503 AD, Sofala in 1505 AD, Lamu and Pate in 1506. They finally also defeated a combined fleet of Egyptians, Arabs and Persians in 1509 AD. The succeeding Portuguese occupation resulted in a passive resistance on the coast and interior reducing the flow of gold to a trickle, with Sofala barely meeting expenses. The overall Portuguese trading losses during its 200 year long control of East Africa ran as high as 40% over revenue. When Turkish power attempted to infiltrate the East Africa Coast at the end of the 16th century AD, they were welcomed as liberators. By the middle of the 17th century AD, Omani sultans had dislodged the Portuguese from Muscat (Middle East) and were raiding East African ports, with Fort Jesus (Mombasa) falling to Oman in 1698 AD. This ended 200 years of Portuguese occupation north of Cabo Delgado (northern Mozambique) that had sought and yet failed to obtain economic exploitation through military control, as this ended up undermining commerce. If this was not disastrous enough, around 1580 AD a Bantu group, the cannibalistic Zimba from Malawi, arrived at the Portuguese trading posts of Tete and Sena, killing and eating every living thing, including people. The Zimba arrived in Mombasa by 1589 AD and were finally subdued near Malindi by warlike Segeju people moving down the coast (July, 1970; Pikirayi, 2003 *In: Beinart & McGregor, 2003*).

The Omani proved to be no better masters than the Portuguese. Civil war in Oman resulted in Pate, Malindi, Pemba, Mafia and Kilwa revolting by the 1750s AD, while Mombasa and Kilwa considered themselves as independent states. By the mid-1780s AD, Oman was left with only a fragile control over these city-states (July, 1970).

It was “at this time that slaving became important”. Slaving had never been an integral part of the Portuguese era. However, by the middle of the 18th century

AD, the Dutch from Cape Town were taking slaves from Madagascar and Mozambique, soon to be joined by the French, who needed plantation labor on the Indian Ocean islands of Ile de France (Mauritius) and Bourbon (Reunion). In 1776 AD, a French trader, Captain Morice signed a treaty with the Sultan of Kilwa to supply 1,000 slaves/year. By 1790 AD, the French were taking 1,700 slaves/year from Kilwa. By 1811, Zanzibar had become the chief center for coastal trade with 6,000 – 10,000 slaves annually going to Mauritius, Muscat and India along with ivory, rhinoceros horn, etc. Half of Zanzibar's annual tariff revenue went to the Sultan of Oman. Eventually, Sultan Sayyid Said would move his Omani throne to Zanzibar to take advantage of the wealth coming off the African Continent (July, 1970).

The slave trade was the cause of the dissemination of African natives throughout the Indian Ocean shoreline and its areas of influence. In Mesopotamia and even in South China, African slaves were present from 800 years ago. In addition, the presence of the new settlers left a lasting impact along the Kenyan coast; today, some 40,000 descendants of those first Arab traders still inhabit this region. Conversely, the influence of the East Indies on the interior of Africa was scarcely significant regardless of the fact that over the past two thousand years there have been small settlements along the coast (ANON, 2002d).

1.7.3 Southern Africa

1.7.3.1 Khoisan-speaking groups (click language)

Prior to the arrival of the Bantu, a hunting and gathering people, the Bushmen/San lived all over Southern Africa, which at the time was flush with game and fruit-bearing trees, bush and shrub. Somewhere north of the Zambezi River, the southward Bantu migration split into “human tributaries”. The arrival of the Herero and Ovambo along a westerly route, the Sotho-speaking people through the central areas from Botswana, Lesotho, the Free State, Limpopo, Northwest and Northern Cape Provinces in South Africa, the Tsonga in Mozambique, the Venda in the Zoutpansberg of South Africa, and the Nguni [Zulu, Swazi, Ndebele (Matabele) and Xhosa] along the eastern coastal belt pushed the San/Bushmen out of their traditional hunting grounds. Those who resisted these advances were butchered, their women becoming part of the conquering chief’s harem (Becker, 1974). Smith (1992) places the first indication of cattle in the Transvaal Highveld (South Africa) in the 5th century AD (400-450 AD) and estimates that a significant numbers of early iron using people and their cattle were present in the Transkei (southeastern South Africa) by the seventh century AD (Smith 1992).

In some cases agro-pastoralists would have developed amicable relations with San hunter-gatherers, as was the case between Pygmies and farmers on the forest fringes. Given a choice, hunters would not have become herders, while agro-pastoralists would have been reluctant to give up breeding stock, except maybe small stock. Thus in such instances (adoption of small stock), hunters would have given up their traditional way of life to become poor agro-pastoralists or in some cases developed a master-servant relationship with the agro-pastoralist (Smith, 1992).

In the Western Cape, some traditional hunter-gatherers now called Khoi/Khoikhoi/Hottentot became herders with cattle and small stock, while those who remained hunter-gatherers, the San/Bushmen tended to become clients, attaching themselves intermittently to herders as suppliers of food or becoming permanently dependent on a patron. The San were valued as watch-dogs and trackers for the Hottentot against raiding by other pastoral peoples; in essence, they became mercenaries during wars between the Hottentot/Khokhoi nations (Smith, 1992).

Diamond (1997) believes that malaria, which moved southward with the genetic resistant Bantu (sickle cell)¹³ and their farms that provided breeding habitat for the mosquito vector, had a major adverse impact on San populations who had no immunity to this disease. With the coming of whites in the 1650s AD, San were decimated by further epidemics of measles, small pox and other diseases, as well as hunted down like vermin. Where the Bantu and Khoi did not marginalize the San, collision with inland moving Dutch/Afrikaner Boer trekkers helped push the last remaining hunter-gatherers of Southern Africa into the hostile regions of the Kalahari Desert. By 1800, the Bushmen were virtually extinct, with the exception of the harsh inhospitable deserts where remnants of their hunting and gathering way of life continued until recent times (Becker, 1974). In the 21st century, modern bore holes (see Chapter 6 on boreholes), conservation policies [Chapter 3, Section 3.9.2, Eco-Genocide and the San of the Central Kalahari Game Reserve (CKGR), Botswana] and government policies favoring pastoralists, often elites, jeopardize the remnants of this once vast extensive decentralized society.

¹³ Heterozygote sickle cell carriers are much more resistant to malaria than those with just normal hemoglobin, this condition developing among African populations living in areas where malaria was endemic.

1.7.3.2 Great Zimbabwe – Shona Kingdom

It is said that the Shona originate from the Karanga, who came from the Congo basin (July, 1970).

“The Shona were most likely the first Bantu-speaking people in the area, displacing the Khoikhoi (Bushmen) and possibly some central Sudanic inhabitants. By the 10th century AD, Shona speakers had become the most numerous people between the Zambezi and Limpopo rivers, though they were by no means the only inhabitants. The Shona comprised a mosaic of disparate chieftainships, similar in their languages and livelihoods - based on a combination of agriculture and animal husbandry - but with a diversity of religious beliefs and customs. Although all were patrilineal, their political organization and means of succession varied considerably. Familial and dynastic competition was common, though there were no standing armies and major conflicts were few. After 1000 AD, centralized states began to emerge among the Shona. It was not until the 14th century AD, however, that these empires became distinguishable, as they competed for trade in gold and ivory with Arab and, later, Portuguese merchants” (ANON, 2002e).

Major empires include Mapungubwe (1050-1270, AD), Great Zimbabwe (Mwanamutapa, 1290-1450 AD) and Changamire (a break away kingdom from Mwanamutapa, 1450-1820 AD) on the Zimbabwe Plateau, as well as Thulamela and Torwa (ANON, 2002e; Pikirayi, 2003 *In: Beinart & McGregor, 2003*).

“Located in the south central African nation of Zimbabwe are the ruins of monuments and cities built of stone. These ruins extend to a radius of 100 to 200 miles (161-322 km), a diameter almost as great as the entire nation of France. Believed to have been built by southern Africans about 600-1,000 years ago, they are evidence of a thriving culture. Until recently, the ruins were believed by Western historians¹⁴ to be the remains of a ‘mysterious white race’ in the heart of

¹⁴ Such as Bent (1892), Hall and Neal (1907) and Gayre (1972). They argue that Great Zimbabwe may have been the work of Sabaean Arabs that many consider white but Diop (1974) considers to be of mixed blood and heavily influenced by Ethiopia.

Africa...It is now generally accepted that the ruins of Great Zimbabwe reflect the culture of the Shona peoples, a Bantu-speaking ethnic group, who reside in the region today. The name Zimbabwe comes from the Shona. Roughly translated it can mean ‘Houses of Stone’ and is associated with ruler ship” (The Sankofa Project, 1999).

Ancestors of the Shona, contemporaries of the Mali Empire, occupied Great Zimbabwe from the 13th to the 15th centuries. Most archaeologists agree that the Zimbabwe-type stone structures were intended to be indicators of status serving as dwelling places for the elite. The population of Great Zimbabwe, is believed to have been as high as 18,000 (The Sankofa Project, 1999). Diop (1974) argues that there were strong links and influence (e.g., architecture and religion) directly or indirectly between ancient black Ethiopia and the founders of Great Zimbabwe.

These ruins are believed to have been indications of the development of a large-scale centralized political authority in the 14th century AD associated with the arrival of the Mbire, a Bantu group with advanced metal and masonry skills migrating from Lake Tanganyika, who revitalized the Shona Kingdom, which by the middle of the 15th century AD experienced rapid territorial expansion. With Zimbabwe as a base, due to over-population and a shortage of salt, and urged by Arab traders, the Shona Kingdom extended its rule from the Indian Ocean to the Kalahari Desert and from the Limpopo River in the south to the Zambezi River in the north, gaining the praise as *Mwena Mutapa* (master pillager), or Monomotapa (Mwanamutapa) as called by the Portuguese (July, 1970).

Some archaeologists believe that Great Zimbabwe rose as a religious center. It is probable that it was a place where Mwari, the supreme Shona god, was revered and where cults of the *Mhondoro* (spirits of the ruling dynasty) flourished. It is also possible that Zimbabwe was a result of surplus wealth from the East African gold trade. By the 14th century AD, external trade existed between Great Zimbabwe and the city-states of the East Coast such as Sofala on

the southern coast of what is now Mozambique. Sofala was an important port where goods from India, China and the Islamic world (Red Sea, Persian Gulf) were imported and then sent into the interior, which in turn exported products from inner Africa. Gold was the most sought after export, but other exports, such as copper, also played a role. There was a sudden increase in building activity at the same time, as was the case in the cities on the East African Coast (The Sankofa Project, 1999). July (1970) estimates that as much as US\$ 1 million/year in trade flowed through Sofala in gold, ivory, amber, pearls, coral and copper.

“Between 1509 and 1512 AD António Fernandes traveled inland and visited the Mwanamutapa kingdom (Great Zimbabwe), which controlled the region between the Zambezi and Save Rivers and was the source of much of the gold exported to Sofala. Soon after, Swahili traders resident in Mwanamutapa began to redirect the kingdom's gold trade away from Portuguese-controlled Sofala and toward more northern ports. Thus, Portugal became interested in directly controlling the interior. In 1531 AD, posts were established inland at Sena and Tete on the Zambezi, and in 1544 AD a station was founded at Quelimane.

In 1560 and 1561 AD Gonçalo da Silveira, a Portuguese Jesuit missionary, visited Mwanamutapa, where he quickly made converts, including King Nogomo Mupunzagato. However, the Swahili traders who lived there, fearing for their commercial position, persuaded Nogomo to have Silveira murdered. Between 1569 and 1572 AD an army of about 1,000 Portuguese under Francisco Barreto attempted to gain control of the interior, but Barreto and most of the soldiers died of disease at Sena. In 1574 AD, an army of 400 men under Vasco Fernandes Homen marched into the interior from Sofala, but most of the men were killed in fighting with Africans. From about 1628 the Portuguese gained increasing influence in Mwanamutapa, and they became intimately involved in the civil wars that led to the demise of that kingdom by the end of the 17th century AD” (Columbia University Press, 2000).

A network of trading stations, missions, acquisition of land and mining rights turned the Mutapa king into a vassal to Portugal by 1629 AD. The size of

Mwanamutapa, the difficulty of communication and travel, as major rivers became barriers to the movement of armies, interference by the Portuguese and the absence of an orderly system of power transfer, resulted in the formation of breakaway states/kingdoms. Various governors distanced themselves from the ruling family and in this way, once the powerful king Matope passed on at the end of the 17th century AD, the breakaway Changamire kingdom, led by its governor Changa, conquered most of Mwanamutapa leaving only a small weak remnant in the Sena-Tete region. Ngoni invaders in the early 1830s AD put an end to the Changamire state (July, 1970)

McCann (1999) believes that Great Zimbabwe, like Mali and the Songhay Empires, occupied a zone which allowed it to withstand a harsh seasonality dominated by the movements of the Inter-Tropical Convergence Zone into the southern hemisphere. The Zimbabwe Plateau has a wet season from November to March followed by a dry season from April to October. Rainfall was sufficient to support crops like sorghum, millet and squashes in the elevated woodland savanna. It was estimated that one season in five suffered from drought and/or crop failure. This plateau area is uniquely tsetse fly free, and adjacent to lowland grazing areas that are seasonally free. Cattle are believed to have provided the major source of meat and milk, in addition to serving as a hedge against a shortfall because of poor rains or crop failure.

Some believe that the decline of Great Zimbabwe during the 15th century AD was in direct relationship to the decline of coastal cities (The Sankofa Project, 1999). Great Zimbabwe lost much of its power and importance due to a number of probable factors, including environmental degradation and a drop in the gold trade (McCann, 1999; The Sankofa Project, 1999). People living in Great Zimbabwe practiced agriculture and cattle herding, but the presence of too many people living in and farming one small area soon led to environmental degradation

(ANON, 2002a). There is thus a growing consensus that over-grazing, deforestation and drought in the 15th century AD were the primary causes for the empire's loss of status and power (Beinart & McGregor 2003). Eventually, the land was no longer able to sustain such a large number of people. McCann (1999) hypothesizes that shifting climatic conditions, resulting in an advancement of the tsetse fly belt, and/or a prolonged drought may have occurred, affecting the food supply and pasture needed to support a large plateau population. Pikirayi (2003 *In: Beinart & McGregor, 2003*) believes environmental changes combined with social and political events all contributed to the decline of this empire. These factors included drought and famine, Portuguese attempts at conquering the state in the 1570s AD, the Zimba "menace", revolts against the state in the early 17th century AD and wars between the Mutapa and the Portuguese, which ended in the 1630s AD. The Portuguese grabbed large areas of land, *prazos*; in the lower Zambezi. This resulted in hunger, famine and depopulation while undermining the authority of the ruling Mutapa. The Portuguese and their slave armies, the Chikunda, attacked local people, enslaved them, and deprived them of their property. Changamire Dombo organized an army expelling the Portuguese from the Central Plateau of Zimbabwe between 1693 AD and 1695 AD, thereby ending this threat. Between 1700 AD and 1750 AD, the Mutapa Kingdom shifted its base from the plateau towards the lower lying and harsher Dande and Chidima areas of the lower Zambezi. Pikirayi (2003 *In: Beinart & McGregor, 2003*) gives the reasons for this move as a search for increased security against the Portuguese and fighting among rival ruling houses, as opposed to over-population and environmental degradation.

"Great Zimbabwe was an early example of a state in this region of southern Africa with much political, economic, and military power. With its formation, social and political organization became more hierarchical. This involved a move from village level organization to a larger, broader social and political organization resulting in the Kingdom of Great Zimbabwe" (ANON, 2002a).

1.7.3.3 Thulamela

“The ruins of the ancient stone city of Thulamela were uncovered less than a decade ago in the Kruger National Park of South Africa's northern provinces. Thulamela, whose name means ‘place of giving birth,’ was built by the Shona people about 800 years ago. The city thrived between 1350 and 1650 AD and its people employed sophisticated mining skills, and succeeded in converting iron ore into carbon steel for use in tools and weapons, and traded along the Swahili Coast” (ANON, 2002e).

Others link this site to the Venda speaking people of area who in turn are linked to the Shona and Great Zimbabwe (Bunn & Auslander, 1998). This area is now part of the Makuleke contractual park (see Chapter 9, Section 9.6.3.7, Makuleke Contractual Park, South Africa).

1.7.3.4 The Zulu (Ngoni) Nation and its movement

It is believed that the fertile and relatively disease free environment of what is modern-day KwaZulu Natal permitted an uninhibited increase in population growth that by the end of the 18th century AD could no longer provide adequate pasture (July, 1970). As land became scarce, warfare changed from quasi-recreational into a strategy of conquest and survival. Poland, Hammond-Tooke and Voight (2003) attribute this change to increasing human populations, climate change (cycles of high rainfall followed by drought) and increasing contact with Indian Ocean commercial centers [e.g., whites in Lourenço Marques (Maputo) and the Cape Colony]. The *Madlathuli* (“They-eat-dust”) drought of 1800-1803 is thought to have possibly played a major role in triggering this change, decimating herds and crops while reducing thousands to destitution.

Young men were organized into military regiments based on age grades. Three Zulu federations arose: Ngwane, Ndwandwe and Mthethwa. Shaka was the bastard son of the chief of an insignificant group, the Zulus within the Mthethwa.

He displayed such military prowess that the Mthethwa chief, Dingiswayo, aided him to succeed his father as chief of the Zulu. While it is said that Dingiswayo instituted military regiments based on age grades, with manhood proven on the battlefield as opposed to circumcision, it took Shaka to refine this approach. Shaka took war from casual spear-throwing to hand to hand combat, using short stabbing spears, *assegai*, and a closure tactic, called the “cow-horn” that surrounded and encompassed the enemy. By the time Shaka became chief of the Zulu, the Ndwandwe had conquered Ngwane, who fled north to establish the Swazi nation. In 1818, the Ndwandwe defeated the Mthethwa, killing Dingiswayo. Shaka did not participate in this defeat (July, 1970).

Shaka retaliated in the “*Mfecane*” (“crushing”) combining his Zulu troops with that which was left of the Mthethwa army. He defeated the Ndwandwe and became the master of Zululand. Shaka quickly spread his territory through military conquest, limiting the authority of territorial sub-chiefs and ruling through his *indunas* (military leaders). Youth from all over the territory were required to do service in Shaka’s military barracks, where they were divided by age groups and trained, developing a bond that transcended ethnic differences. The result was cultural assimilation that served as a basis for the rise of the Zulu nation. The state relied on force to overwhelm the weak. In 1828 AD, Shaka was killed by his half-brother Dingane, but in the short decade, Shaka had created a nation (July, 1970). Shaka’s militaristic approach of absorbing other groups would eventually be felt as far away as southern Tanzania, where Nguni groups settled (Martin & O’Meara, 1995).

After being well on the way to subduing the Xhosa, the northern migrating land-hungry trekboers (Afrikaner/Boer) escaping British authority would clash with Nguni-speaking Zulu headed by Shaka’s brother Dingane in 1838 AD (Martin & O’Meara, 1995). They forced the Zulu to evacuate all territory below the Tugela River, which resulted in Dingane being unseated by his brother Mpande (July,

1970). In 1879 AD, after defeating the British at Isandlwana and killing Prince Napoleon, heir to the French throne, Cetewayo – Mpande's successor – was captured and imprisoned. He eventually pleaded his case to Queen Victoria but never regained his power, even though he had been promised. He died in 1844 AD, still fighting for his people. This marked the end of the Zulu nation (July, 1970).

Because of the *Mfecane*, factions of the defeated Ndwandwe clan of Soshangane moved northward (July, 1970; Parker, 2004) forming the Gaza Empire of Mozambique and the Shangaan people. In the 1820s AD, Soshangane moved to Delagoa Bay in what is modern Mozambique, and then inland where he came into conflict with another Zulu fugitive, Zwangendaba, in 1831 AD. Soshangane took over the area from the Zambezi to the Limpopo forming the Gaza Empire, in what is now Mozambique, which reduced Portuguese trading settlements to tributary status. The Gaza Empire became part of Portugal's African holdings by 1895 AD (July, 1970).

The Ngoni leader, Zwangendaba and his followers escaped a bad mauling by the Ndwandwe of Soshangane about 1831 AD and were forced into the Changamire Empire of the Shona where they were defeated again by another Nguni group moving north. Using Zulu fighting tactics, they devastated Changamire of Mashonaland and sacked Zimbabwe, crossing the Zambezi in 1835 AD, where they encountered strong but decentralized Lunda states. They moved through the land making use of a scorched earth policy against defenseless communities, passing to the west of Lake Nyasa (Malawi) to a point east of the southern tip of Lake Tanganyika. Here Zwangendaba settled creating Maputo, where he died in 1848 AD, 20 years after his great trek. With this strong leader gone, successions resulted in the Ngoni being broken into five groups. One group, the Tuta moved up the eastern side of Lake Tanganyika as far as the south side of Lake Victoria,

absorbing Nymawezi people and destabilizing the area, all of which aided the Arab slavers. The others dispersed west into modern Zambia and east into southern Tanzania (July, 1970) and Mozambique.

Meanwhile, the Mfecane pushed people out of one area and forced them into another: the Drakensberg Mountain area. Once such Sotho group, the Kolo, led by Sebetwane took off, seeing no future in the chaos and turmoil that ensued. They fought themselves through Tswana country, and after years of wandering ended up at the Zambezi River at Victoria Falls around 1838, where they subdued the indigenous Aluyi through intermarriage and created the Kolo Kingdom observed by David Livingston in 1851, now called the Lozi Kingdom (July, 1970).

Meanwhile, Mzilikazi and his Ndebele, also fugitives from the *Mfecane*, left behind a trail of destruction during their movements from 1821 to 1836 AD. They arrived in Matabeleland (southwestern Zimbabwe), once the domain of Changamire. During this trek, they settled near modern-day Pretoria for about ten years (near today's Hartbeestpoort Dam, at the foot in a passage through the Magaliesberg Mountains), eventually having to move due to threats from Dingane. Heading into Tswana country, they were attacked by Boers mistaking them for Griqua raiders, forcing Mzilikazi across the Limpopo. His organizational structure in Matabeleland was similar to that of Shaka, ruling through *indunas*. A class structure arose, giving privilege to direct descendants of the Ndebele over absorbed groups, which helped to preserve the language and culture. Mzilikazi's death was proceeded by a civil war in which his son Lobengula succeeded him (July, 1970); the latter eventually had to face the onslaught of the British under Cecil John Rhodes in the 1890s.

1.8 CONCLUSIONS

Africa is considered the “Cradle of Mankind” where modern humans were born. Pre-colonial Africa is the only continent where man and wildlife co-evolved and where massive extinctions of mega-fauna did not occur until about 350 years ago with the arrival of the European colonizers. A second wave of extinction can be associated with the human and livestock population explosion of the 20th century AD brought about by the colonizers’ introduction of modern medicine and veterinary care.

In pre-polonal Africa, the development of sedentary agriculture is believed to have been the basis for allowing the evolution of small-scale rural societies into complex hierarchical organizational structures in the form of kingdoms and empires with non-food producing groups such as artisans, *griots* and armies. These sophisticated kingdoms and empires had well-structured societies, systems of governance and armies as a means of protecting and expanding their realms of influence and controls over access and management of resources. Vast trade networks existed with North Africa, Europe, the Middle East, and Asia. The sale of slaves as part of this trade network may have been one of the most devastating and tragic events impacting African societies prior to colonialization and it is this activity, which first brought Africans into significant contact with the European world beginning in the middle of the 15th century AD.

The rise and fall of many of these empires is believed to have been due to a combination of over-expansion and loss of socio-political control, environmental degradation and climatic change, struggles over access to Africa’s wealth in natural resources, as well as the Islamization process, which took place through militaristic conquests under the armor of “*jihads*” throughout the Sahel.

Over-population and land hunger are believed to be closely tied to the southward Bantu migration out of the Sudano-Sahelian Zone (Bénoué Valley of Cameroon and Nigeria). They had a major impact on culture in East and Southern Africa. Their summer rainfall crops stopped them at the Fish River, South Africa, where they eventually came into conflict with the northward moving Boers, who were able to settle in the temperate climate of the Cape with winter rainfall crops brought from Europe. Likewise, over-population and land hunger are believed to have been the key to the Nguni migrations northward as far as Tanzania, leaving a wake of social destruction in their paths as they forced others to adopt their military culture of conquest or perish.

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Chapter 2

2.0 TRADITIONAL NATURAL RESOURCE MANAGEMENT IN SUB-SAHARAN AFRICA

“Those who ignore culture are doomed to failure in Africa. Those who understand culture can find new ways to succeed...outside prescriptions only succeed where they work with the grain of African ways of doing things. They fail where they ignore, or do not understand, the cultural suppositions of the people they seek to address” (Commission for Africa, 2005).

“The slowness of the advances...in recognizing the contribution of indigenous peoples to maintaining biological diversity may contribute to the collapse of faunal and floral species that have been sustained by these groups for much of human history” (Langton, 2003 *In:* Adams & Mulligan, 2003).

“The white man thinks he understands the black man, but he knows him less. The black man thinks he understands the white man but he knows him less. The white man knows more about each other than the black man knows about each other” (Kibonde, *pers. comm.*).

This last statement refers to the lack of understanding between the Westerner and Africans, and at the same time points to the considerable similarity between the various Eurocentric cultures as opposed to the great diversity of cultures on the African Continent. These cultures, both within Africa and between Africa and the rest of the world, often do not understand each other and/or seem to be in conflict with each other. This chapter delves into how Africans and these diversities of cultures have traditionally managed their natural resources over the ages.

Pre-colonial Africa has often been depicted as a land of uncivilized warring savages in loin cloths and spears, with no knowledge of the environment or

insight into its sustainable use. Many believe that Europeans were required, with their modern wildlife, forestry, fishery and agricultural practices, Linnaean nomenclature and bureaucratic structures, to bring about the conservation and sustainable use of these resources. Many believe that without European intervention, Africa may very well have depleted its resource base in a process of self-destruction.

While Child (2004 *In: Child, 2004*) argues that Anglo-Norman protectionist game laws imposed on Africa under colonialism inhibited local institutions from developing, this chapter hopes to explain the relatively sophisticated systems that already existed/exist and are still for the most part being ignored as a means of integrating traditional value/management systems into modern conservation concepts. It might be better argued that colonialism and independence have impeded the evolution of these traditional management systems, ignored them and in some cases exterminated them, but they did exist prior to colonialism. In most cases, they are still present today, though often in a deteriorated state. However, they may be an important part of an “African solution”, if recognized and formally integrated into modern Western wildlife and natural resource management concepts. This could result in an Africanization of conservation that rural people can relate to, since as is evident in proceeding chapters “modern Western-driven conservation” has and is alienating the people of the subcontinent from what they have undertaken for 100s of years: the sustainable use of their resources and the conservation of biodiversity. May this chapter form the basis for better understanding these traditional management systems and hopefully spark debate and innovative thinking as to their utility even in 21st century Africa.

Chapter 3 discusses perceived perceptions by Europeans of Africans and their management systems and the disenfranchisement of Africans from their resources, especially wildlife, because of colonialism. Chapter 9 discusses the use

of traditional hunting guilds to manage a game reserve in Burkina Faso (Chapter 9, Section 9.8.9.1, Management of Comé-Leraba Game Reserve, Southern Burkina Faso), while in Chapter 11 a case study will be presented discussing how modern conservation is still ignoring traditional concepts, resulting in the eco-genocide of local cultures (Chapter 11, Section 11.11.7, Eco-Genocide in Southeastern Cameroon, the Forest People and *Dobi Dobi*, More Parks and Protected Areas).

In pre-colonial Africa, human and livestock populations were low and game populations were high. There was therefore less of a need to intensively manage wildlife than there is in the 21st Century.¹⁵

A risk-spreading strategy of using different resources from the same ecosystem avoided becoming too highly dependent on one single resource/environment. For instance, floodplains provided rich soils for recession agriculture, fisheries, pasture for livestock and wildlife, and waterfowl; while forests provided game, “*ignames*” (wild yams), honey and other wild foods, medicines, fuelwood and timber. In many cases, such as among the Mpiemu of the Sangha Basin, wild resources from hunting, trapping, fishing and gathering provided more and nutritionally better balanced food than cultivated resources (Giles-Vernick, 2002).

Capitalism and ownership of resources existed but unlike in the West where wealth is measured through an individual, ownership and wealth were controlled by a very strict social hierarchy through extended families and clans, often under the authority of chiefs, headmen, elders or religious leaders. While an individual could increase his status within society based on his skills in accessing and providing resources to the community (e.g., as a good hunter, farmer or warrior), individuals did not own land or resources. Rather they were borrowed from the

¹⁵ From Chapter 2 onwards, unless stipulated all dates and centuries are AD.

ancestors, and when a person died, they were returned to the community/ancestors. Anthropologists call these “Common Property Resources”, belonging to the community as opposed to the individual, or “Open Access Resources” belonging to everyone but the responsibility of no one but the state that resulted from the imposition of centralized management systems with the coming of colonialism (see Chapter 3) and the last 40 years of independence.

Child (2004 *In: Child, 2004*) defines “conservation” as a socio-economic process by which societies endeavor to manage resource scarcities and limit offtake within the biological capacity of the systems in order to sustain production. While not employing modern Western designed concepts such as measuring carrying capacity, maximum sustained yields, wildlife counting and indices as a means of setting harvest quotas, etc., pre-colonial Africans nonetheless used a number of management interventions. Natural resources were managed as “Common Property Resources” for the good of the greater community. Chiefs, elders and guilds, through the ancestors, carefully controlled access to natural resources including agricultural land, pasture, wildlife, tree products, fish, etc. Taboos determined protected species not to be hunted and by implication others which could be hunted (e.g., Bisa traditionally hunt buffalo, impala and warthog, but there was a taboo against “striped animals:” zebra, kudu, bushbuck) (Marks, 1984). According to Hakimzumwami (2000), in Central Africa, in addition to clan controlled territories, “cultural beliefs, taboos, respect to sacred sanctuaries, totems, etc., are believed to influence community behavior towards the use of natural resource, especially wildlife”. The ancestors and spirit world were consulted through chiefs (Hinz, 2003), spirit mediums and “master hunters” to assure a safe and successful hunt or harvest. Ultimately, by means of culture, taboos based on religion and traditional value systems, local rules and regulations enshrined in farming practices, land tenure systems and folklore, the indigenous Africans protected and conserved ecosystems and their associated biodiversity. In

addition, territoriality, mobility/migration, fire, harvest regulations (e.g., no harvesting of pregnant female or young), seasons, hunting guilds, etc. resulted in biological and sociological controls. Habitat manipulation was also (e.g., fire) employed to design landscapes needed to suit the various lifestyles of rural Africans.

Rules and regulations regarding access to natural resources were precise and codified, although not written down, and had been enforced since time immemorial. The result was sustainable exploitation of natural resources. This had been accomplished with no ecological purpose (e.g., maintenance of biodiversity) in mind, as we understand it, but out of a sheer instinct for self-preservation. Conservation of game animals and fish was necessary in order to provide for survival in the future. Ghai (1992, *In:* Fabricius, Koch & Magome, 2001) concludes that while in sparsely populated areas regulation over access to natural resources may have been minimal or non-existent, in most communities, systems existed to conserve resources and to ensure the equitable distribution of resources at the level of the household.

2.1 TRADITIONAL HUNTING AND WILDLIFE MANAGEMENT

“The story of the hunt will be tales of glory until the day when animals have their own historians”, old Zimbabwean saying *In:* Sogge, 2002).

“More likely, the top 1,000 hunters that ever lived have been lost to history, because the top 1,000 were illiterate. They were black Africans who probably never met a white man. Africa has produced thousands, no millions of native hunters, who would have embarrassed Neumann, Bell and Selous (Great White Hunters of the 19th and 20th centuries). This terrific trio could have walked into any village in remote Africa and hired a dozen hunters with more skill than they possessed” (Cacek, 2004)

When one reads the history of professional hunting in Africa, the landmark is normally considered the creation of the East African Professional Hunters Association in 1934 at the Norfolk Hotel in Nairobi, Kenya that started the era of the “Great White Hunter”. What most people fail to realize is that professional hunting existed for 100s of years among Africans, with apprenticeships that produced and still produce “Great Black Hunters” (Marks, 1976; Mariko, 1981). Tré-Hardy (1997) explains that in Francophone Africa, for generations and in every tribe, there was a hunting caste. Whenever and wherever able-bodied men were needed, this caste of qualified hunters organized the hunt and/or provided supervision to others. The organization was something akin to the political situation of the Middle Ages in Europe when the strong protected the weak and claimed the exclusive right to resources in the area. This implies that many hunters were also the leaders within their communities.

The “Great White Hunters” of yesteryear will confide in you that they were only as good as their trackers, the majority of whom were and are traditional hunters. To quote well-known Mozambican safari operator and author Adelino Serras Pires (2001), “My success was 80% due to my tracker (a traditional hunter), 10% to my driver and 10% to me. Every time I and my tracker found ourselves in an unfamiliar territory, it was a local hunter we would take on to help us locate the game” (Pires, *pers. comm.*). Pat Hemingway (son of Ernest) stated that to be fair, in Rowland and Ward’s trophy records, the names of the trackers should be placed before the owner of the trophy, since in most cases without them the trophy hunter would have gone home empty handed (Hecker, 2003). Anno Hecker (2003), who along with Pat Hemingway taught at Mweka Wildlife College in Tanzania, goes on to say, “I too felt quite often inferiority complexes when being faced with the art of hunting by those half naked savages”. Harry Selby (Woods, 2004) in an article about the East African Professional Hunters Association “Shaw and Hunter Trophy” for the professional hunter whose client

collected the most outstanding trophy says, “I myself never did (submit entries) and could have done so had I chosen. In many cases luck was the contributing factor in collecting the trophy, and the part played by the trackers and gun-bearers – often crucial – was not recognized – only the professional hunter got the honors”. Harry Selby is a living legend made famous in novels written by Robert Ruark, the “dean” of today’s professional hunters who retired from active guiding in 2000.

In the introduction of his book on traditional hunting in West Africa, similar to Marks (1976; 1984), Mariko (1981) states that “Hunting is a profession, a life” (Figure 2.1). Like Marks (1976; 1984), Mariko (1981) explains how totems, the spirit world, initiation rights and hunting guilds, which limited access to the profession and controlled-access by the chief and elders, played dominant roles in who would become a hunter and how, when and where wildlife could be accessed. Hunting was often the fabric that held their societies together.

MacKenzie (1997) provides the names of many African cultures to demonstrate how widespread and important hunting was to the:

- Hottentots and Bushmen collectively, Khoisan-speaking (click language) peoples of Southern Africa;
- Nguni/Zulu of South Africa;
- Sotho Tswana of South Africa;
- Griquas, a mixed race people of Tlhaping, Rolong and Kgwaketse of the Northern Cape, South Africa and today’s Botswana;
- Tswana of today’s Botswana;
- Ndebele and Shona of today’s Zimbabwe;
- Lozi and the Barotse in the upper Zambezi of modern Zambia;

- Gwembe Tonga of Zimbabwe/Zambia whose lives were destroyed by the Kariba Dam (discussed in a Chapter 7, See Section 7.9.1.3, Zambezi River);
- Luba and Lunda from Zaire/northwest Zambia;
- Luvale and Ndembu of western Zambia and the Bemba and Bisa of eastern Zambia descendants from the Luba-Lunda;
- Nyanja of southern Malawi and the Konde of the northern shores of Lake Nyasa (Malawi);
- Kamba, Wata (Waliangulu) of Kenya;
- The Nyamwezi of Tanzania, whose famous chief was Mirambo;
- Kikuyu of Kenya;
- Ndorobo of Kenya and northern Tanzania;
- Boni hunters in Tanaland of northern Kenya;
- Maasai of Kenya/Tanzania;
- Shambaa just inland along coastal Tanzania;
- Kimbu hunters of the Ukimbu Forests of central Tanzania;
- Lango, north of Lake Kyoga, the Jie (east of the Lango), Uganda; and
- Hamram Arabs of Sudan.

This can be supplemented by Mariko (1981) who provides examples from West and Central Africa including:

- Pygmies of the Central African Forests;
- Dozo, Donzow among the Mandingo, Malinké, Dioula and Palaga (Senoufo) mainly from Burkina Faso, Ivory Coast and Mali but stretching through Guinea-Conakry, Senegal and Gambia;
- Light-skinned blue-eyed Malaba bow hunters ranging from Senegal to the Nubian Desert and north to the Mediterranean;
- Mahalba of Northeastern Niger;

- Neolithic Caucasian Nemadi of Mauritania;
- Gow and other Zarmaphone Hunters from the *Boucle Du Niger*;
- Azna Hunters from Houssa, Niger;
- Tuareg;
- Toubou of Niger; and
- Mangawa, Daguirwa and Kanouri.

Musah, (2000 *In: Musah & Fayemi*, 2000) describes traditional hunters in Sierra Leone, the Kamajoisia (Kamajors) among the Mende ethnic group in the south, the Tamaboro or Kapra among the Temne in the northeast and the Knos and Kissis of the southeast (see Chapter 13, Section Chapter 13, Section 13.10.2.1, Sierra Leone, war and diamonds). Ibo (1994) states that in the Ivory Coast, traditionally the great hunters were also warriors. Hunters/warriors, like the Dozo (Chapter 5, Section, 5.7.4.4, Land reform and civil war in the Ivory Coast) have in modern times have become embroiled in fighting over control of Africa's natural resources and political power.

These are just a few of the many which these authors do not mention, such as the Hadzabe (WaTindiga) of Tanzania who speak a “click language” similar to the Bushmen; Shangan and Ndau of Zimbabwe/Mozambique/South Africa, the Baya of Cameroon/Central African Republic (CAR/RCA), the Lobi of the Burkina Faso/Ivory Coast border and the Kulango along the northern Ivory Coast/Ghana border.

Traditional African hunting methods (e.g., bows and arrows, crossbows, spears, traps, nets, snares, pitfalls, axes, assegais, clubs, poison and introduced muzzle loaders), compared to the technologically advanced firearms brought in by the Europeans, were relatively inefficient (Mackenzie, 1997) and under low human population numbers had little or no impact on game populations (Carruthers,

1995). While Africans may have controlled and manipulated the landscape to the benefit of livestock and agriculture, there seemed to have been a place for wildlife as a supplemental resource, while Europeans, with their modern firearms, devastated the game, bringing a number of species to extinction (see Chapter 3). This is a far cry from the perception of modern society, which is often the reverse of this scenario.

MacKenzie (1997) believes that for many Africans, hunting and gathering were constant indulgences, but their importance ranged from merely that of a pleasant pastime and a means of collecting additional dietary variation in a good year (plenty of rain and little disease) to that of a grim economic necessity in years of crop failure and livestock disaster. He also believes that hunting was “not just a function of necessity, but a preference involving excitement and romance, recreation and training” (e.g., courage, war, and leadership). Some individuals would be born with the “hunting instinct” in which the desire would be greater than that of his brothers. These individuals would do most of the hunting and/or be initiated into the hunting guilds and their rituals, secrets and taboos of the hunt, by which elders controlled access to wildlife in managing it for the greater good of the community as a “Common Property Resource”. Child (1995) estimates that 2-10% of any community will have the urge to hunt, regardless of whether it is a modern urban society or indigenous rural community.

2.1.1 Importance of Hunting to Maintaining Social Stability in Rural Small-Scale Societies

Due to the harshness of the environment, resulting in droughts, floods and cycles of agricultural pests, food security was/is addressed through a cooperative network of kin relations so that no one went/goes hungry (Marks, 2001; Hitchcock, 2003a). The importance of wildlife in the diet of Africans should not

be underestimated. The word for meat and wildlife is often the same word, *viande* in Francophone countries, “*nama*” in Hausa, *eyama* in Lingala of the Congos and *nyama* in East and Southern Africa. Likewise, the percentage of protein by weight of cooked animal flesh is much higher than in cooked vegetables (Peterson, 2003):

- 15-40% protein by weight in cooked red meat, fish and fowl;
- 2.5-10% protein by weight in cooked cereal and legumes; and
- No more than 3% by weight in cooked roots such as potatoes, yams, manioc, green leafy vegetables and fruit.

While nuts, peanuts and soybeans rival the protein content of animal flesh, their protein, except for soybeans, often lacks certain essential amino acids, the building blocks that make up protein, compared to red meat, fish, fowl and dairy products. Mixing complimentary vegetables such as wheat and a legume can help make up for this deficit. Of the twenty-some amino acids constituting dietary protein, all but nine can be synthesized by the human digestive system from simpler substances. Those nine are called “essential amino acids” that our bodies cannot synthesize and must be acquired from the foods we eat. The plant foods that provide all nine amino acids may not provide them in efficient ratios that allow their conversion to protein. While wheat and rice provide the nine essential amino acids, they are comparatively lower in the amino acid lysine and only contain half of what is found in animal proteins. Thus, only half of the protein from these grains can be used to assemble human protein. The rest, the unused and leftover amino acids are burned as energy like carbohydrates. Likewise, vitamin B-12 is lacking in a purely vegetarian diet that can result in the development of pernicious anemia and neurological damage. Thus for traditional cultures, especially in Sub-Saharan Africa, wildlife was and is a very important

source of protein (see Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade) (Peterson, 2003).

The rites of hunting among many traditional societies that disturbed nature by killing required a counterbalance by acts of restoration and re-harmonization (Hinz, 2003). These requirements had to be fulfilled in order not to upset the basic social order and human's relations with their ancestors and nature. Thus, while the modern trophy hunter is an individual, the traditional hunter was/is part of a community for whom he hunted, who was keenly aware that he was disturbing the harmony of nature, had to pay by accepting certain restrictions (taboos) and who was obliged to make retribution to the ancestors in order to restore harmony at several stages of his hunting exercise (Hinz, 2003).

Among the Bulu of southern Cameroon, the rite of *sô* was the main initiation ceremony for a young man to become a 'true man' (*nya môtô*) and a real member of Bulu society. It involved a period of initiation, with those succeeding able to take part in the *sô* ceremonies. The *sô* is the name of the bay duiker (*Cephalopus dorsalis*) and the rite centered on the hunting and symbolic consumption of this animal, bringing together villages on a geographical, rather than clan base. Identified by ritual scars on the nape of the neck, forehead, jaws and forearms, the members of the *sô* came from many clans, united against misfortune and war. To make a pact the group would kill a *sô*, followed by each person cutting himself and placing the blood into the meal prepared with the *sô*. Each member of the pact would then partake in the meal making them 'brothers'. It would then be taboo to kill each other, regardless of what one of them said or did to the other, because it would be like killing yourself. This pact was called *avusô* (literally, tomb of the *sô*) (Solly, 2002).

Traditionally meat was for consumption of the lineage/clan group and not for commercial uses. Strict rules existed for the partitioning of the game among the community (Marks, 1976; 1984; Mariko, 1981; Ngaka, 2003; Thoma, 2002). Hunting and the collection of wild food were undertaken by the Hambukusu of the Okavango Delta only at a subsistence level to meet family needs. The non-commercialization of these resources assured a food reserve in times of famine and drought (Mangurunga, 2003).

For the Maasai, who co-existed with game, wildlife served as a protein reserve in times of extreme drought and hunger. In these rare cases, they ate only even-toed ungulates (e.g., buffalo, eland, Grant's gazelle, Thomson's gazelle, impala, and giraffe) (Mbarnoti, 2003).

Among the San also called Khwe (Khoe), Basarwa/Bushmen, hunting and gathering and the sharing of individual gains created a social network necessary for survival. The Ju/'hoansi San of Eastern Bushmanland were gatherers first and hunters second. Both men and women gathered bush foods that supplied 80% of their diet. Women usually gathered about three days a week. Hunting, and trapping, far less efficient, occupied men for an average of four days a week and provided 20% of the diet. Most meat and hunting produce was supplied by small animals such as steenbok, duiker and pig (most likely warthog), which were shot or trapped. Individuals distributed their own food, and gave and received their own property; this being the primary means that bound them into a larger society based on mutual obligation (Marshall & Ritchie, 2003).

Among the Ju/'hoansi and other groups there was a "concept of powers that links husband, wife, family, community and nature" in some kind of balance. Hunting, pregnancy and childbirth required extraordinary power. Roan, eland, gemsbok

and giraffe played an important role as *n!ow*, an inherent power that can be good or bad, that can bring rain or cold and is shared with human beings (Hinz, 2003).

As noted in Marks (1976; 1984) among the Bisa in Zambia, and Mariko (1981) in Francophone Africa, the distribution of meat from the hunt along with various taboos associated with the hunt, strongly tied the hunter to the community and the community to the hunter with regard to social responsibilities. This formed an important part of the network of cooperation that held these small-scale communities together and assured survival of their members. Wildlife was managed and exploited for the greater good of the community from which the hunter originated.

Among the egalitarian Baka Pygmy hunting and gathering society of Southeastern Cameroon, the Baka repress individualism and hierarchies as a means of maintaining harmony within the group. All game meat and other wild products are shared to the benefit of the Baka band or community (Nkombe, *pers. comm.*).

Because of the dangers of hunting, loyalty, honesty and chastity were required of the hunter and his apprentices, their wives and all the members of the family. All accidents caused by guns blowing up, falling, snake bites and animal attacks were associated with the hunter, or his wife and family breaking rules of conduct (Mariko, 1981; Hinz, 2003). Thus, as expressed by Marks (1976; 1984), the norms and morals of hunting helped reinforce the norms and morals of these rural small-scale societies.

2.1.2 Controlling Wildlife Distribution by Habitat Management

The Zulu of South Africa and the Ngoni (Zulu descendants) of northern Mozambique left unpopulated boundaries between chieftaincies as “wildlife reserves” (Mackenzie, 1997).

There is strong evidence that the pre-colonial East Africa of the 19th century was not the wildlife paradise that it is today, with about 25% of Tanzania set aside as parks and game reserves in the 20th/21st centuries (Kjekshus, 1977), nearly 40% by 2004 if all protected areas are combined (see Chapter 11, Section 11.10.6.3, Few success stories with the 10% factor). In East Africa, as elsewhere in the world, where people have expanded as farmers and cattle keepers, wildlife was gradually becoming extinct (Kjekshus, 1977). Burton (1860 *In:* Kjekshus, 1977) claimed that grass burning combined with organized hunting greatly checked the wild animals; “in the more populous parts game has melted away before the woodsman’s axe and the hunters arrows”. Dublin (1991 *In:* McCann, 1999) and Kassam and Bashuna (2002) were able to document a similar situation in Kenya.

In fact many of Tanzania’s well-known game reserves and parks of the 20th/21st centuries, including the Selous, Ngorongoro Crater, Serengeti, Lake Manyara National Park, and Lake Rukwa Game Reserve, had more people and livestock than wildlife prior to the 1890s (Kjekshus, 1977). The reasons for the changes that resulted in increases in wildlife in both Kenya and Tanzania are discussed in the next chapter (Chapter 3, Section 3.1.8.1, Ecology of an empire in Tanganyika and Kenya).

However, bush between settlements served as wildlife habitat (Kjekshus, 1977). For instance, Ford (1971 *In:* Kjekshus, 1977) mentions the massive bush clearing and wildlife eradication scheme utilized by Mzilla, one of the Ngoni (Nguni)

chiefs of northern Mozambique in resettlement of cattle and people in the Mzailizwe Valley in 1861. However, MacKenzie (1997) argues that they did leave certain areas for wildlife, indicating some sort of conservation ethic and utilitarian, cultural and likely spiritual value by the Ngoni for wildlife. The Ngoni were descendants of the Zulu who knew that *nagana* (bovine sleeping sickness) in South Africa was carried by wildlife. Their kings therefore organized large hunting parties to clear game so that cattle could be introduced (Mackenzie, 1997).

Wildlife remained rich in abundance in the bush (tsetse fly belts – vector of sleeping sickness), covering an estimated 33% of Tanganyika in the pre-1890s (Kjekshus, 1977) that was not contested for human habitation and existed between the larger tribal settlements (Kjekshus, 1977; Mackenzie, 1997). This is believed to have been the case over much of Africa, wildlife thriving in areas abandoned or never “developed” for agriculture by African civilizations.

2.1.3 Controlling Access to Wildlife through the Chief

In most African cultures, the chief, representing the ancestors and responsible for the survival of his people, controlled access to the land and its resources including wildlife (Marks, 1984; Mariko, 1981; Sithole, *pers. comm.*; Mangurunga, 2003). The *Chef de Terre* (land chief) controlled hunting activities along the Logone River of Chad (Dadnadjii & van Wetten, 1993) and still does so in southern Burkina Faso.

What today is Bénoué National Park used to be the private hunting grounds of the *Lamido de Rey-Bouba* (Fulani ruler), whose permission was required to hunt the area, defaulters being punished by traditional laws (Njiforti & Tchamba, 1993 *In:* Kemf, 1993).

Among the Oukwanyama, an Owambo (Ovambo) ethnic group in Namibia, the time of large scale hunting was determined by the king. When the dry season started, the king held the *oshipepa* ceremony during which he ate the first sorghum of the year's harvest, followed by a ceremonial hunt lasting one and a half to two weeks. By the time the royal hunt had finished most game had given birth to young and the people could begin to hunt. Similarly, among the Uukwambi [Owambo (Ovambo) group] the king started hunting and if someone wanted to hunt, permission was required from the king (Hinz, 2003).

Among the Hima, before somebody could hunt, the chief, on waking in the morning, would call his wife and send her into the bush to collect *ondombo* (*Poutoltia mixta*). The roots of this plant were cleaned, cut, watered and then put into a container (*Otjipurira*). The wife, chief and hunter tasted the substance, after which the chief went to the holy fire and addressed the ancestors, “*Please give this person luck to get one bull in the house. We are hungry*”. When the hunter returned with the bull, the horn was brought to the holy fire saying, “*Today, I have sent somebody away to hunt for a kudu bull in the mountains. I will not eat it in the mountain. I will do it here with my family*” (Hinz, 2003). Thus, the role of the chief in the hunt was to assure the success of the hunter and, in return, the survival of the small-scale rural society by ensuring that meat from the hunt was equitably distributed among community members.

Among the Tswana, the chief controlled wildlife and granted the right to hunt (Cullis & Watson, 2005).

Among the San, who have no chief, a *de facto* community head, normally the oldest man or woman within the core group was the guardian over the natural resources (Hitchcock, 2003a).

2.1.3.1 Royal game

Among a number of cultures, certain wildlife was reserved for the chief and one required special permission to hunt it. For instance:

- **Shangaan, Southern Africa.** Among the Shangaan, the lion and leopard, eland, kudu, sable and buffalo were royal game and one required special permission from the chief to hunt them. When one of the above antelopes was killed, it disturbed the land of the chief when falling, thereby polluting the soil with its blood. When one of these animals was killed, the half of the animal from the side that touched the ground must be given to the chief for compensation (Sithole, *pers. comm.*);
- **Bisa, Zambia.** Eland, lion, elephant, rhino and hippo were identified with the chieftaincy and when killed on a chief's land, parts of these animals had to be sent to the chief as a sign of allegiance (Marks, 1976; 1984);
- **Zulu, South Africa.** Leopard was royal game, and the skin was given to the chief/king who, in turn, compensated the hunter with a cow/ox. All tusks of hunted elephant went to Shaka the king (Ritter, 1955);
- **Tswana, Bechuanaland (Botswana).** In the 19th century, Tswana chiefs declared elephant, giraffe, eland and ostrich as “royal game” which the population could not hunt without permission. Lion skins, the breast of eland (*sehuba*) and the tusk of the elephant “nearest the ground” were destined for the chief (Hitchcock, 2001). Cullis and Watson (2005) list eland and gemsbok as royal game;
- **Mafwe, Caprivi, Namibia.** Hippo, eland, giraffe and buffalo were reserved for the chief. A hunter who killed one of these animals, under threat of punishment had to report the kill to the *kuta* (traditional court, advisors/*indunas*) before anyone could eat the meat. The chief would take

a piece of meat for himself and the hunter was allowed to keep the rest (Hinz, 2003);

- **Mayeyi, Namibia.** Hippo, buffalo, elephant, eland and giraffe were reserved for the chief (Hinz, 2003);
- **Gciriku (Kavango Group), Namibia.** Giraffe and hippo, “animals with long noses”, were reserved for the *hompa* (king) (Hinz, 2003);
- **Ondonga [Owambo (Ovambo) Group], Namibia.** Permission was needed to hunt elephant, the tusks going to the king. After the hunt, the hunter had to go to the king’s palace and sit at a special place where he was fed and women sang. Skins of leopards and lions were given to the king. When approaching the palace with the skins or tusks, the hunter blew a whistle along the way to inform the community he had killed an important animal (Hinz, 2003); and
- **Uukwambi (Owambo (Ovambo) group).** The eland was reserved for the king and its stomach used as a dress for the wife of the king (Hinz, 2003).

2.1.4 Territory in Controlling Pressure on Wildlife

In essence, in most cases the chief controlled a territory, and access to all resources within the territory.

However, while many hunting and gathering groups did not have chiefs, their access to wildlife and other resources was linked to clearly defined territories and cooperative actions to assure the survival of these small scale rural societies, “Remote Area Dwellers” (RADs) as some have called them in recent times (Hitchcock, 2002). Mobility, within these territories prevented over-utilization of wildlife and other resources, while allowing resource recovery during “fallow” rest periods. Wild foods found when gathering were probably more important than hunting. This territoriality and mobility within the territory was combined

with harvesting a diversity of resources, from game, to fish, honey, wild tubers and grasses, etc. so that pressure on the resource base for food was spread around and no one resource was rapidly overused.

2.1.4.1 Territory and wildlife management among the Dioula of southern Burkina Faso and northern Ivory Coast

Hunting areas were controlled by given villages and permission to hunt was required from the “master hunter” of that village, both by village-based hunters and outsiders (Traore, 2000). Ibo (1994) indicates this process among the Bakoué.

2.1.4.2 Territory and wildlife management among the Baka Pygmies and other ethnic groups of Cameroon and Congo

“In Central Africa, traditionally land is a sacred and common resource. It constitutes the mystic link between communities and their descendants. Despite new regulations, natural forest is informally subdivided into clan territories, which are naturally delineated. The clan respects others territory boundaries...The rights to use resources such as wildlife are underpinned by spiritual affiliations to land resources (forest, water, wildlife, etc.). Although members of society informally have equal right to use resources, traditional owners (generally a given clan) are those with primary spiritual affiliation and have therefore the ultimate responsibility to control resources in their territories” (Hakimzumwami, 2000).

Among the Baka, each lineage/clan group or village had a clearly defined territory. Everyone from this family had the right to use the “paths of their ancestors” and to exploit the resources around these paths. Only those Baka and Bantu who had been authorized by the *propriétaires de la route* or the owners of the route had the right to use these paths and thus the resources of an extended

Pygmy family (Schmidt, 1998). This implies, as with the Ju/'hoansi, that groups from outside the lineage and/or the Bantu/Pygmies ties had to obtain permission from the group to access the territory and its resources. Similar territorial management systems have existed for 100s of years and still exist among the Baveuk, Babouté and Bouté ethnic groups but may be jeopardized by the creation of hunting blocks and a national park (old Pangar Djerem Game Reserve) (Biko'o, *pers. comm.*) (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks and Protected Areas). According to Peterson (2003) until the area along the Congo Brazzaville side of the Sangha River, which is now part of the Lake Lobéké/Dzanga-Sangha/Nouabalé-Ndoki “*Tri-National De La Sangha*” National Park complex, was turned into a logging concession for CIB (*Congolaise Industrielle des Bois*) in the 1960s [See Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)], the Baka divided this area into nine separate hunting zones. Hunting chiefs (*chefs de chasse*)¹⁶ from each community met once every four years to determine practices and problems, consider if species or areas needed protection from over-hunting, and if necessary redefined the agreed upon boundaries of these traditional hunting blocks. This ended by the late 1980s, when Pygmy *chefs de chasse* stopped meeting because the bulldozing of roads by the logging company into the forests and the arrival of “professional hunters” (commercial poachers/hunters) from the outside, many from the Bakoulé ethnic group walked in and took over the Baka’s resources.

Claridge (1922) speaks of the Bakongo having clearly delineated hunting territories reserved for specific hunting parties (guilds) along the borders of present day Angola, Congo Brazzaville and the DRC. Fire was a key management tool, and anyone who abused the use of it was severely punished. Hunting took place in September (Claridge, 1922). Likewise, Hakimzumwami

¹⁶ Note: Baka traditionally do not have chiefs in the classical sense. This could have been “*tuma*”, (great elephant hunters) or something adopted from encroachment of Western or Bantu ideas.

(2000) describes that hunting in the DRC was traditionally regulated by a customary land manager, implying territory, who determined where and when the season of hunting, only for subsistence purposes, would take place.

2.1.4.3 Territory and resource management along the Inner Delta Of Niger

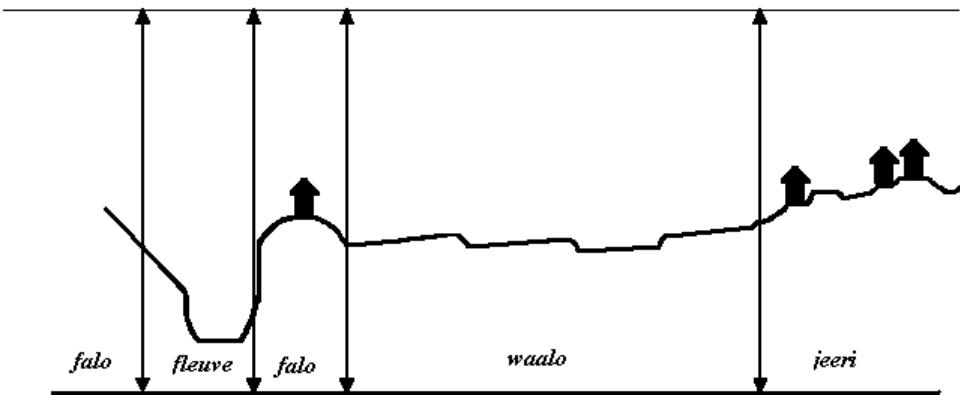
The Inner Delta of the Niger River is typical of Africa's floodplain ecosystems; its complex ecology is linked to traditional production systems of fisheries, recession agriculture, wild foods and pastoralism. These resources were managed under a common property management system during the 19th century under Fulani rule called *Dina*. The *Dina* was divided into a number of grazing territories allocated to loose Fulani clan groupings within which there were groups of subordinate farmers and more independent farmers; farmer/fishermen, and hunting and gathering fishermen (Moorehead, 1994). Exchange and cooperation between ethnic groups was common place. For instance the Peul (Fulani) provided meat and milk, Bozo provided fish, Songhay agriculturalists along the river provided grain, and Dogon living along the Bandiagara escarpment provided onions, pepper and grain, while Tuareg brought in salt (Smith, 1992).

2.1.4.4 Territory and resource management along the Middle Valley of the Senegal River

Boone (2003) describes a system that has extended into modern times, first left alone by the French and then by the newly independent country of Senegal through power sharing agreements. This area is known as the Fouta Toro after the Halpulaaren Foutanke Kingdom of 1515 made up of the Toucouleur/Fulb   (Peul/Fulani) (see Chapter 1, Section 1.4.5, Fulani, Toucouleur and Dioula Kingdoms, the Spread of Islam). The Toucouleur society was dominated by powerful lineages that controlled access to the floodplain. Following the

theocratic revolution against the Foutanke monarchs from 1778-1865, the Fouta was loosely united under a weak Islamic state headed by a ruler (*Almamy*), who was elected by representatives of several dozen prominent families. Under the *Almamyat*, the feudal Toucouleur society endured with a powerful aristocracy, controlling access to the floodplain in a high population density zone (Boone, 2003).

The land was broken into discrete territorial units or provinces known as *leydi*, long strips bisected by river (Figure 2.2) (Boone, 2003) similar to the *Dina* system along the Inner Delta of the Niger.



faalo (Pulaar): high damp banks (seasonal gardening, dry-season encampments)

fleuve (French): river

waalo (Pulaar): floodable basin, rich soil (flood recession agriculture, grazing)

jeeri (Pulaar): higher, sandier banks (rain-fed agriculture, villages, grazing)

Source: Redrawn Boone (2003, redrawn with permission from Barreteau, 1998:14) with permission from Cambridge University Press & Barreteau.

Figure 2.2: Cross-Section of Middle Valley, Senegal River showing makeup of *leydi* territorial units

The *leydi* under the *Almamyat* were managed as microstates by lineages of noble Toucouleur *Toroobé* who occupied positions of political power, extending on both sides of the river. The *Toroobé* provided provincial leaders including the

chef de territoire, village chief and *imam*. This elite controlled access to farming, grazing and fishing on the floodplain, as well as rainfed agriculture (Boone, 2003) and certainly wildlife.

This system of management was part of a strong caste system. Freemen or *RimBé* were at the head of a caste system, with a religious aristocracy from this group, the *Toroobé*. Next in the caste system were artisans including iron workers, leather workers, weavers, fishermen, woodworkers and oral historians (*griots*). At the bottom of the caste system were slaves, whose positions were transmitted by inheritance with no property rights. The oligarchy cultivated some land but mostly lived off land rents and tithes received in return for access to land (Boone, 2003).

2.1.4.5 Territory and resource management, the Ju/'hoansi of Eastern Bushmanland, Namibia

The following is believed to apply equally to the Ju/'hoansi of Ngamiland, Botswana: traditional geographical boundaries were more socio-cultural than political. The Ju/'hoansi (San) of Eastern Bushmanland, Namibia did not have chiefs, resource wealth or control of property in their society, which was based on equality. Individuals distributed their own food and gave and received their own property; they thus bound themselves into a larger society based on mutual obligation. Gathering and hunting were individual, not group activities; cooperation came in men tracking once an animal had been shot. *N!ore* (territory) is a Ju/'hoansi word for a named place with a source of water and resources of bush foods in its immediate neighborhood (Marshall & Ritchie, 2003).

All their rules of land ownership and residence were based on fixed, predictable resources of bush foods and water, (ultimately on permanent water,) with the

result that the association between Ju/'hoansi groups and the places they inhabited was extremely stable and ecologically communal (Marshall & Ritchie, 2003). Access to resources in the *N!ore* were inherited from one's parents or gained through marital/other ties (Hitchcock, 2000a; Marshall & Ritchie, 2003). Thus, permission to hunt within the *N!ore* was along lines of kinship, historical association and specific local resource availability (Hitchcock, 2003a; Thoma, 2002).

2.1.4.6 Territory and resource management, the Ju/'hoansi, Ngamiland, Botswana

The following is believed to apply equally to the Ju/'hoansi of Ngamiland (Eastern Bushmanland), Namibia. Among the Ju/'hoansi of Ngamiland, Botswana, individuals, often elderly persons, both males and females were recognized as having long-standing rights to an area and were considered land managers, or, as they are known *kxai kxausi* or *n!ore kxausi*. A territorial owner was sometimes called a *k@xau n!a* by the Ju/'hoansi. This individual may or may not have been a group leader. In some cases, he or she was considered to have a certain amount of authority and responsibility for organizing and managing natural resource related matters, but it should be stressed that they could not make formal decisions without seeking public consensus in the group (Hitchcock, 2003b). The same terms and processes existed for the neighboring Kung Bushmen in Tsumkwe West (old Western Bushmanland) (Arnold, *pers. comm.*). As Marshall (1976 *In:* Hitchcock, 2003b) notes, what a *k@xau n!a* did was to give focus to the ownership of the resources. This position was passed from one generation to the next, and thus it expressed continuity of ownership from generation to generation.

A non-resident group seeking access to a N!ore, would approach the *n!ore kxausi* who made their decisions on the basis of whether or not it was felt by the community that there were sufficient land and resources available to sustain additional people. Such decisions were usually taken on the basis of public consensus. The criteria used in reaching decisions included whether or not the individuals seeking access to the local group's land had either kinship or marital (affinal) ties to the group. There were sometimes conditions under which other groups were not allowed to enter an area, such as when there was a severe drought in progress or when key local floral resources such as mongongo nuts were scarce (Hitchcock, 2003b).

2.1.4.7 Royal hunting reserves

Game reserves in Sub-Saharan Africa, limiting access to game, existed well before the arrival of the white man:

- In the 1820s, Shaka created a royal game reserve in the Umfolozi District of Zululand, which was out of bounds to commoners (Carruthers, 1995; Fabricius, *et al.*, 2001). This was in the region of the modern day Hluhluwe Game Reserve and acted as a preserve for the ruling political and military class (Murombedzi, 2003);
- Mzilikazi set up a game reserve in Matabeleland called Maduguza, west and northwest of his capital, Bulawayo, where no one was allowed to kill without the king's permission (Murombedzi, 2003).
- The hunting Shangaans of the southeastern lowveld of modern Zimbabwe set up a royal wildlife preserve in the area around present day Gonarezhou National Park (Murombedzi, 2003);
- The *amaSwazi* (of Swaziland) also had royal hunting reserves (Fabricius, *et al.*, 2001); and

- The Fulani King, the *Lamido de Rey-Bouba* had a royal hunting reserve in which permission was required from the *Lamido* to hunt. This reserve was situated in what is today's Bénoué National Park (Njiforti & Tchamba, 1993 *In: Kemf, 1993*) (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks and Protected Areas).

2.1.5 Mobility as a Means of Managing Natural Resources

In essence, mobility served, similar to fallow in agriculture, to rest an area over a certain period of time, giving the wildlife populations and other resources an opportunity to recuperate through growth and reproduction, thus assuring sustainable harvests.

2.1.5.1 Mobility and resource management, the Ju/'hoansi, Nagamiland, Botswana

Hitchcock (2000a) discusses a number of practices among the Ju/'hoansi of both Namibia and Botswana that demonstrate how they actively managed their resources. The Ju/'hoansi stopped foraging in an area if they felt that there were too few resources, allowing the area to rest so that the plants and animals could rebound. This might be considered a form of fallow management. They sometimes used a kind of hunting and gathering zone rotation strategy, going out in different directions from their residential locations over time. The growth of desirable plant species was encouraged by burning the bush; some people referred to this strategy as "Bushman plowing". People also transplanted desirable plant species such as morama (*Tylosema esculentum*), which produce both nuts and roots that are highly nutritious. One reason that wild plant populations in the /Xai/Xai (Botswana) region remained healthy was that the Ju/'hoansi exploited a

large number of them, over 120 species so that if certain species started becoming scarce, they could shift their emphasis to other species, allowing the pressured species to recuperate.

2.1.5.2 Mobility and resource management, Tyua Bushmen of northeastern Kalahari

The Tyua Bushmen populations of northeastern Kalahari, Botswana, had a kind of tethered land use system in which groups remained close to permanent water during the dry season and ranged out over the landscape during the wet season, when they gathered berries, nuts, and bulbs and engaged in hunting and trapping. A major factor affecting residential mobility in the northeastern Kalahari was the presence of other groups in the habitat. Among the Tyua, long-distance cooperative hunts included large numbers of hunters, sometimes as many as 30. Long-distance hunts were carefully organized with the assistance of a *dzimba*, a man particularly skilled in hunting and who was often called upon to take the lead in long distance hunts. In essence, he played the role of a leader/chief, but was not a chief. Women and children often accompanied men on these long-distance trips to provide a labor force for processing the various animals killed by the hunting party. These cooperative hunts were reminiscent of the communal hunts organized by Tswana chiefs. Environmental monitoring and information sharing were employed by Kalahari populations in an attempt to reduce the degree of unpredictability and risk (Hitchcock, 2003a).

2.1.5.3 Mobility and resource management, Baka Pygmies of Southeastern Cameroon

The Baka Pygmies of Southeastern Cameroon are a hunter gatherer culture, typically divided into bands of extended family numbering 40-50 persons per

group over a vast territory. They have few material needs other than hunting implements and cooking utensils. Their society is simple and flexible and membership within a band is not definitive (Nkombe, 2004). Among the Baka Pygmies of Southeastern Cameroon, there is no chief, only leaders in the form of “*kobo*”, (elderly wise men), “*koboa wose/kobowossé*”, (elderly wise women), “*tuma*”, (great elephant hunters) and “*Nganga*” (healers) (Schmidt, 1998; Nkombe, 2004).

Mobility of the Baka, like many hunting and gathering groups, prevents over-exploitation and permits the forest to renew itself (Schmidt, 1998; Nkombe, 2003). Most hunting took/takes place within short distances of the village. Hunters were/are, for the most part, men of between 18 and 55 years of age, who occasionally use guns but mostly caught/catch their prey with steel wire snares (Abilogo, Mondo, Logo & Nguiffo, 2002). Traditionally, they hunted with crossbows (*arbaletes* or *mbano*) and poisoned arrows, spears (*mbenga/mbomanya*), later adopting guns (Nkombe, 2003) and snares from the Bantu (Nkombe, 2004). For the Baka, these movements were considered a pleasure, not a constraint. *A go a bélé* (go for a walk) or *na sia bélé* (regard the forest), signifying the importance of the forest in their life (Nkombe, 2004). Schmidt (1998) describes the following seasonal movements:

- ***Mbanda.*** “Field hunts” near where they practice agriculture;
- ***Mombato.*** These are short forest visits of days-weeks, not far from their village to gather *ignames* (wild yams) or fish, and at times to trade forest products in order to be able to celebrate on occasions like Christmas; and
- ***Molongo.*** Long stays in the forest during the dry season (middle of November to middle of March) of 40 km or more from the village to escape the dust and heat of the sun during the dry season where they gather roots and wild mangoes, fish with weirs, search for honey and hunt

small game with lances, snares (pulled each morning) or crossbows with poisoned arrows.

These movements are not random but take place over clearly defined territories. Seasonal movements allow the natural resources to renew themselves. Nkombe (2004), a Cameroonian anthropologist initiated into the Baka manhood rites provides further divisions of movement/kinds of hunting, which he prefers to consider more as strategies for exploiting the forest for food than types of hunting:

- ***Sendo*** is a short walk from the village by men to undertake some hunting and collect honey, etc. as a means of meeting daily needs. Women and children may accompany their husbands;
- ***Noa*** is a short walk that women take into the forest (they are able to return to the village on the same day), individually or collectively and at times accompanied by husbands or fiancés, to collect food such as *ignames* (wild yams) and fish. If the opportunity presents itself they may hunt;
- ***Mombato*** is a visit of women to the forest lasting from a couple of weeks to months to gather and hunt mainly small game, which is consequently dried; and
- ***Maka*** is big game hunting far from the village lasting weeks to months by “seasoned” hunters with specialties to hunt specific species taking place before important ceremonies such as Jengui (Djengi or Forest God) manhood initiations, circumcisions *Beka*, and funerals. This hunt is preceded by a special ceremony, in which women dance the *yéyi oule yélé*. The *Maka* is the only hunt in which women do not participate, because of the dangers of hunting elephant, buffalo, gorilla, etc.

According to Nkombe (2004), traditionally *molongo* was not a type or strategy of hunting as *sendo*, *noa*, *mombato*, or *maka*, but a way of life, a permanent camp deep into the forest in which the entire Baka band took a “trip into the forest” to hunt and gather for months up to years; the primary *mode de vie* (way of life) of the Baka. Today, *Molongo* has become more a form of hunting (long-distance movement) than a *mode de vie* or permanent residence in the forest. *Mbanda* is similar to *molongo* but related to the Bantu *mode de vie* in the forest permitting them to practice agriculture away from the village without concern for possible crop damage by domestic stock, while hunting with snares and blackpowder muskets. Today, in mimicking the Bantu, the Baka also have *mbanda*, but practice more *sendo*, *noa* and *mombato* than agriculture as a mean of nostalgia for their former way of life which is rapidly disappearing (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks and Protected Areas). The Baka are losing control over both their territories and mobility due to government policies, including buy-ins of Western designed and imposed parks and protected areas through the Global Environment Facility (GEF) program, as well as from forest fragmentation caused by logging companies.

2.1.5.4 Mobility and resource management, Ik of Uganda

The 56 km (35 mi.) wide Kidepo Valley formed their major hunting territory for most of the year and was known as “This is the place of God” given to them by their god *Didigwari*. Traditionally, the Ik were excellent conservationists. Since game, and even more so vegetation, could be exhausted quickly if a hunting band stayed in one place for too long, non-random mobility was essential to their lifestyles, as opposed to aimless wandering. Their nomadic movements were clear and precise depending on the time of the year, the rainfall/weather and the movement of game. Hunting and gathering, even in a marginal environment was

neither hard nor precarious. It was therefore possible to find fresh food daily. The Ik lived in sympathy with rather than trying to dominate (European mentality) nature. While for a farmer the results of a year's work can be destroyed overnight (e.g., elephant and other crop raiders, sudden drought, hail, locusts, etc.), the most the hunter can lose is what he can replace tomorrow. Over-hunting was considered a major crime and was only undertaken after long treks through non-productive territory. Hunting was a cooperative effort, with women and children participating in certain hunts (e.g., netting drives). Men were dominant only during the hunt, which had not only physical, but also supernatural dangers. However, it was the women who provided the bulk of and most reliable source of food from gathering and who had an equal say in where the group hunted and gathered. Mobility served more than economic needs; it allowed for constant realignment of friendships and work units, dissipation of disputes and a constantly shifting locus of authority so important to the egalitarian hunter. Family was a broad term, in which the hunter gatherer band with whom a person was associated was considered as family, a child considering any adult in the band as a parent and any age-mate as a brother or sister. The “environment invariably provided the central theme” that held them together, giving them a sense of common identity; it was a hub around which their life evolved and it provided all the necessities such as food, shelter, clothing and spiritual existence (Turnbull, 1972). Taken from this environment, the Ik as a culture would no longer exist (Chapter 3, Section 3.9.3, Eco-Genocide and Ik, the Mountain People).

2.1.6 Hunting Guilds as a Means of Controlling Access to Wildlife

Wildlife was anything but an “Open Access Resource”. Access to wildlife over much of Sub-Saharan Africa was carefully controlled through hunting guilds. Hunting guilds (Marks, 1976; 1984) or *confréries de chasseurs* (Mariko, 1981) have existed in Sub-Saharan Africa for 100s of years. Hunting was considered a

profession. Hunting guilds were widely spread, from Senegal to Niger (Mariko, 1981), among the Mossi, Dioula and Palaga (Senoufo) of southern Burkina Faso, northern Ivory Coast, and southeastern Mali; other Mandingo cultures of Mali through to Senegal; light skinned blue-eyed Malaba bow hunters traditionally ranging from Senegal to the Nubian Desert and north to the Mediterranean Sea, neolithique Caucasian Nemadi hunters of Mauritania; Gow and ethnic groups of Zarmaphone Hunters in The “*Boucle Du Niger*” (Inner delta of the Niger River) Mariko (1981), and as far South as the Bisa of the Luangwe Valley in Zambia (Marks, 1976; 1984) (see Section 2.1, TRADITIONAL HUNTING AND WILDLIFE MANAGEMENT). In some cases, as among the Baka Pygmies of Cameroon, it is not clear that there were true hunting guilds, though a rigid hierarchy of specialty hunters, played the same role by controlling access to various species as will be described below.

Not everyone could hunt, tending to be a male occupation (Mariko, 1981; Marks, 1987; Thoma, 2002). Hunters-to-be were identified through dream summons by the ancestors (Marks, 1976; 2001, DeGeorges, 1992a), and by natural prowess (Marks, 1976, Sithole, *pers. comm.*). Hunting was not necessarily hereditary (Mariko, 1981), though Bisa hunters in the Luangwa Valley of Zambia described hunting “‘as a disease passed on to them by their fathers, something in their blood’ ” and that they had no other choice but to hunt – “‘a calling from the ancestors’ ” (DeGeorges, 1992a).

In many cultures, becoming a hunter helped provide protein for the community and led to leadership roles within it (Marks, 1976, Personal observation of principal author among Dozo hunters June, 2003 in Comoé-Leraba Game Reserve and of Mandingo hunters in the *Zone d'intérêt Cynégétique de la Falémé*, Senegal in the 1980s). The hunter was often a warrior, hero and master of the supernatural in the bush and protector of villages against sorcerers (Mariko, 1981).

Marks (1984) estimates that traditionally only about 25% of the adult males in the Luangwa Valley were hunters. To become a hunter normally required apprenticing under an older “master hunter” and could take anywhere from three to six years (Mariko, 1981, Echappé, *pers. comm.*; Dozo Hunters of the Comoé-Leraba Game Reserve, *pers. comm.*).

The strength and invisible forces of the forest, mountain and soil mistresses were bathed in the continual mystery of nature (Mariko, 1981). In many cultures (Marks, 1976), learning to communicate with the ancestors was paramount. The apprentice hunter was taught not only hunting skills by “master hunters”, but also the secrets of the bush, rituals and taboos that would protect him from the spirits/shades and genies of the bush and game, and that would ensure a successful hunt (Marks, 1976; 1984, Mariko, 1981). Elders held the secrets of how to rest the spirit residing in dangerous game so that it could be hunted safely (Mariko, 1981; Marks, 2001). These elders also held powers to compel wild animals such as crocodiles, lions, elephants, hippos and buffalos to kill or maim individuals. This knowledge would be handed down to a select few, thus acting as a control over harvest pressure by the greater community (Marks, 2001).

Among the Bakongo there is an annual inauguration of the hunting season linked to spirits of the dead and “fairies”/genies who control the disposal of the game (Claridge, 1922). Hunters prepare communion to them at the spot where the dead body of a great hunter has been ceremonially washed, where his hair and clippings from his fingernails are buried, or at the hunter’s grave. This site of communion is called the bloody grave (*nkal’ a menga*) because it is here that the first antelope of the season is offered to the dead. The antelope’s bladder is taken out and filled with blood, which together with wine is poured on the grave. This potion is mixed with the soil and the resulting mud is smeared on the face of each

hunter, this act known as *yow' e toyi*. During the ceremony, all kneel to show unity, while a priest shaking a rattle summons the dead. This is followed by a prayer requesting meat, while a blood smeared drum is beaten and a song is sung:

“Let the man who trusts to luck
Not come, not come,
And let the man who has no pluck
Not come, not come”

The living and the dead have now entered into a fellowship that should result in good hunting. Poor hunting results indicate that the hunter is breaking certain rules or taboos and is not supported by the spirit world. Since an individual's action can impact on the group, implying some sort of “club” as it is called by Claridge (1922) or guild, the hunter can be fined and expelled from this group.

A hunter's success was dependent not so much on his own accomplishments or skills as on the spiritual merit in his lineage (Marks, 1976). Status among hunters was recognized by the medicines (*umuti*) they possessed that protected them and helped them overcome misfortunes. Some wild animals also possessed dangerous “spirits” or “shades” (Mariko, 1981; Marks, 2001). In West Africa, many of the most powerful hunters were also Moslem *marabouts* (priests), or worked with *marabouts* who prepared *gris gris* (amulets) and undertook other sacrifices to both protect the hunter and assure success.

Among the Baka Pygmies, these talismans are known as *simbo* and are worn on the back between the shoulders making the Baka invisible to the animal being hunted. There are *simbo* for elephants, gorillas, leopards, buffalo, etc. Another talisman is the *kudu linje*, a strap of skin from the otter. Among the Baka, one could be initiated into many specialties as one advanced. The ultimate was becoming the *Tuma* (elephant hunter), not because this type of hunting was considered any more noble than hunting a buffalo or leopard, both considered by

the Baka as dangerous, but because the elephant provided the most meat to the community, the ultimate goal of the hunt. In addition to dangerous game (elephant, buffalo, gorilla, and leopard) hunters, there were specialty hunters for snakes, turtles, excavators of animals who live in the ground, bushpig, etc. The Baka traditionally hunted with a spear or crossbow and poisoned arrows (Nkombe, 2003), considering the non-selective Bantu snaring for cowards (Nkombe, 2004). It is the *kobowosse*, or an elderly woman who initiates the hunter into his specialty (Nkombe, 2003; 2004).

Among the Baka, each hunting specialty has its taboos, and secrets for courage and success that the apprentice must learn. Training begins at the age of six to seven, when boys started hunting lizards and mice with crossbows. At the age of nine or ten, boys are initiated into manhood rites of the forest god *Jengui* and the girls into womanhood rites of the *Yeyi*. In essence, these are social guilds, revolving around hunting and gathering, which have the aims of controlling and managing the society and maintaining respect for its taboos and rituals. Such rites and social guilds could definitely be used as positive forces in the 21st century to conserve the forests, if given the opportunity (Nkombe, 2004). The boys can now become hunters. A man who does not have a hunting specialty or does not know how to collect honey cannot take a wife, so all men are hunters (Nkombe, 2004). It is a question of the level of specialization they attain, with the level of difficulty and danger increasing and the rank of *tuma* (elephant hunter) being the pinnacle.

Among the Mpiemu ethnic group of the Sangha Basin, they also had “master hunters” known as *tuma*. The *tuma* had no official authority to limit where, when or what other people hunted. However, his knowledge of “places for killing animals” and powerful medicines applied to his body to give him knowledge about the location and behavior of the game, allowed him to function as a “master hunter” in a guild. A village would give him gifts and he would take 2-3 hunters

with him to hunt, calling the village once they had harvested enough game. Thus the *tuma* exercised considerable influence over where, when and what a village hunted (Giles-Vernick, 2002). According to Biko'o (*pers. comm.*) an Mpiemu himself, everyone could hunt mainly with vegetative snares; today more and more steel snares are used. The *tuma* was mainly called upon to hunt large game and when game became scarce around a village. Biko'o also found it odd that, as described, only a couple of people from the village went on the hunt. Normally, meat is not shared communally between clans/extended families, but only within extended families within a village, who tend to hunt as a clan. According to Nkombe (also Mpiemu) and Biko'o (*pers. comm.*) there has never been a hunting/forest god named *Ntchambe Mkewombo* among the Mpiemu as mentioned by Giles-Vernick (2002). According to Nkombe and Biko'o (*pers. comm.*), the Mpiemu have only one God, *Ntchambe*. However, before being Christianized they believed in a spirit *Mekere*. The *Mekere* spirit served as an intermediary between *Ntchambe* and the Mpiemu, both guiding people in their hunting and helping to heal desperately ill people in the village.

As firearms became available, among the Bisa, and this is believed to be the case in many hunting cultures, the “master hunters” also controlled access to the wildlife by controlling access to firearms (Marks, 1976; 1984).

Among the Fulani of Rey-Bouba, Northern Cameroon, a chief hunter performed traditional rites to the gods before anyone could go hunting, controlling when and what could be hunted. To disobey him meant the likelihood of being killed by wild animals (Njiforti & Tchamba, 1993 *In: Kemf*, 1993).

Among the Wata of Kenya, boys began hunting with bow and arrow for small game. By ten years of age, they accompanied elders on hunts as porters, cooks and camp attendants. They often stalked after dangerous game with adults.

Manhood and acceptance into adult society depended on demonstrating hunting skill and bravery. After the first elephant kill, the hunter was considered a man, with ivory being part of the bride price necessary for marriage (Parker & Amin, 1983).

Among the Bakoué of the Ivory Coast, a “corporation” or guild of hunters under the management of a “great hunter” (*koussoupohiklagba*) from the guild strictly controlled hunting. Traditional hunters were good naturalists understanding animal behavior and reproductive cycles. Hunting was forbidden during the rainy season (*goudeu*), when wildlife dropped their young. Hunting was primarily a dry season activity. To signify the hunting season was over, the “great hunter” hung up (put away) his arm in public. The “great hunter” opened the season with a volley of gunshots (Ibo, 1994).

According to Oularé (*pers. comm.*), the origin of the Donso (Dozo) hunting guilds date back to the 1236 A.D. under the Mandingo Empire of Sundjata (Sundiata Keita [see Chapter 2, Section 1.4.2.1, Sundjata (Sundiata) Keita] and the *Charte Kouroukan Fouga* (The Charter of the Open Space – *Fouga*, On the Mountain - *Kouroukan*). This charter laid down 44 laws with nine traditional chiefs to enforce them. Article 37 of this charter says that “Fakombè is designated chief of the hunters. He is charged to preserve the bush and its inhabitants for the happiness of all”. The brother of the emperor, Manding Bory Keita was chosen to enforce this article and is seen as the “*Father*” of the Donso *confréries de chasseurs* (hunting guilds) (Oularé, *pers. comm.*). Each year at the opening of the hunting season a special rite is performed, Manding Bory *Sö* (Give to Manding Bory), in which a reddish cock, reddish goat or red cola nuts (red is linked to blood and the hunt) are sacrificed to have a good hunt. Among the Dozo of southern Burkina Faso, the apprentice hunter “*donso dewn*”, and his hunting are

controlled by the “master hunter” or “*donsofa, donso-koutogui* or *kalanfa*” as they are called among the Dioula (Traore, 2000).

In Guinea-Conakry, the hierarchy in the Donso hunting guilds among the Malinké are the *simbon* (equivalent to the “master hunter”, normally with about 25-30 years of experience, with dangerous game qualifications), *kalakoun* (a seasoned hunter), *kalati* (apprentice hunter using a blackpowder musket or shotgun) and *nantan* (a young hunter, 15-18 years old using *armes blanches* such as bow and arrow, club, spear, and maybe snares) (Oularé, *pers comm.*). According to Fairhead and Leach (2003), they are guided by *wa ton* (bush law) with regard to wildlife and its management. All are initiated at the hunters’ altar (*dankun*). Traditionally the “master hunter” forbids the killing of pregnant female duiker, a nursing female duiker and young (Traore, 2000). According to Oularé (*pers comm.*), the *donso tan* (hunting guild) forbids anyone to shoot unless the animal is clear of the bush and can be identified and to shoot a female with young. Each year, based on reproductive success and the game populations, the *donso tan* determines what and how many animals can be hunted. Each year a *Fetes des Dozo* or ceremony brings the hunters together to thank the “*dieux de la brousse*” or gods/genies of the bush (Traore, 2000).

Thus, limiting access to this profession, with its secret rituals tied to the spirit world, and to firearms, as well as the guild determining hunting regulations and seasons were key ways of controlling pressure on wildlife resources as a means of assuring a sustainable harvest of game meat. This was especially important for people living in areas where sleeping sickness prevented the raising of domestic livestock. It might be argued that traditional hunting guilds were not so different from Western hunting clubs that rent hunting properties and establish their own rules as to what can be harvested, in some cases being required to produce

wildlife management plans and quotas such as in France (Chantelat, Doumenq, Grange, Koumchasky, Le Pellec-Fonteney & Rebattet, 1989) and Germany.

2.1.7 Totems as an Aid in Wildlife Management

One of the key ways of controlling access to wildlife was through totems. These were animals attributed to a given lineage group which were taboo to kill. Totems are common throughout Africa such as among the Shangan (Sithole, *pers. comm.*). In West Africa (Mariko, 1981), examples include:

<u>Family</u>	<u>Totem</u>
Diarra	Lion
Keita	Hippo and crocodile
Diallo	Francolin
Cissé	Snakes, lion and leopard
Kanté	Monitor lizard, crocodile, chicken and white rooster, turtle

The totems of Kanté apply to all clans linked to blacksmithing and jewelry making. All Mandingo (Dioula) hunters consider the turtle dove as a messenger from the genies of the bush (Mariko, 1981).

2.1.8 Taboos as an Aid in Wildlife Management

Taboos were not only an indirect passive means of conserving some wildlife populations, but were also tied into maintaining social mores in small-scale rural societies where men might be absent from home for extended periods of time, while hunting. Shipton (1990 *In: Madzwamuse & Fabricius*, 2004 *In: Fabricius*,

Koch, Magome & Turner, 2004) states that taboos with regard to harvesting wildlife were only broken during famines, indicating that they might have served to conserve resources for emergencies.

Among the Shangan, sex before a hunt is taboo. If one has sex before a hunt, there is a risk that a female elephant with young will attack and kill the hunter (Sithole, *pers. comm.*).

Among the Kung bushmen a good hunter was fearful of eating or sleeping with his wife, because this would risk his “poison” (on his arrows) becoming cold, as she smelled of milk and *sā* (*buchu*) a herbal powder from the plant *Barosma betulina* (Hinz, 2003).

Among the Nama and Damara, hunters had to abstain from sexual intercourse the night before a hunt, ‘staying as pure as he was born.’ When an unmarried boy hunted, the mother had to abstain from sexual activities until he had killed his game. Wives of hunters were not allowed to quarrel, not allowed to do needle work with sharp tools, not allowed to make beds or sweep the house, nor grind the herbal powder *buchu* (*Barosma betulina*) – as all of these were symbols of the feminine life calming down male powers. Wives had to protect the fire of the hut, because the luck of the hunter died if the fire died. “Dirty water” had to be kept from the fire, it being dangerous for the hunter if soup or sugar spilled on the fire (Hinz, 2003).

Among the Tonga of the Zambezi River, everyone in the community had to partake in a special ceremony requiring them to be submerged in the Zambezi River before ivory could be sold (McGregor, 2003 *In:* Beinart & McGregor, 2003). The killing of female animals with young was forbidden. Hunting was to take place between May and September, but not just before the rains in

October/November, when killing an animal might leave young behind. According to the legend of the Nyaminyami, an animal/fish with a serpent-like head that controlled the flow of the Zambezi, the creature would appear and allow people to cut only the amount of meat from it that they could carry (use); this practice was called *njeka wa cheka*. Cutting (hunting and gathering) more meat than one could carry would result in it rotting before the person got home. Thus one only harvested from nature's resources what one needed so that these would not be exhausted, allowing the Nyaminyami to "regenerate flesh". In essence, this is the concept of "sustainable use" to ensure a perpetual supply of meat and other resources. All of this was guided by the spirit medium and chief, who consulted the ancestors. All hunters accounted for what they killed, by giving a portion of each kill to the chief; in essence a monitoring program. It was taboo to hunt before the meat from the previous kill had been finished. Failure to comply would result in one's children and livestock being lost to wild animals (Sibanda, 2004 *In: Fabricius, et al.*, 2004). Similarly, the Niger God from the 13th century Mali Empire (see Chapter 1, Section 1.4.2, Ancient Mali and the Mandingue [Mandinka/Malinké] Empire) was a turbaned figure in a colorful robe entwined by a serpent (Rosenblum & Williamson, 1987).

Among the Bisa of Zambia, game with more dangerous shades (*vibanda*)/genies included elephant, eland and lion, formerly associated with tribute to the chieftaincy, and were believed to cause mental illness of the hunter and his kin if specific rituals were not followed (Marks, 1984). This reinforced traditional social patterns through creating allegiance to the authority of the chief (Marks, 1976).

Both the Bisa (Marks, 1976) and many of the West African hunting cultures (Mariko, 1981) believed that the genie/shade/spirit of the animal resided in its head and that on killing certain species (e.g., elephant and buffalo) special rituals

were required following the hunt. Like people, animals have a spirit and when they are killed, the spirit leaves the body. A second spirit (a double) resides in the head of the buffalo, lion, leopard, certain antelope, warthog and hare, and can possibly haunt a hunter and give his wife, child or even the hunter mental health problems. Seeing blood or the eyes of game can cause nervous system problems for pregnant women (Mariko, 1981). Cutting off the tail of the dead game among the Dozo, allows the genie to escape (Echappé, *pers. comm.*), and in general among many hunting cultures in Sub-Saharan Africa shows ownership and proof of the kill when the hunter returns to his village or camp. When the author hunted elephant with the Baka Pygmies of Cameroon in 2001, on taking the elephant, he was initially not allowed to lift its ear for fear of death. Only after the tail was cut off, signifying ownership of the elephant and possibly as part of the ritual to allow the animal's spirit to leave peacefully, was he allowed to lift the ear and investigate the exit wound?

Linked to the evil/bad genies found in the animal's head was the Moslem belief in the "evil eye". The evil eye given to the hunter by a genie through a wild animal could make the hunter sterile or impotent. Among the Malhalbi of northeastern Niger, the belief was that lions and leopards were men that had been transformed¹⁷ as a result of having been given the "evil eye". The hunter feared duiker and dorcas and ruffifrons gazelles because they could bring bad luck with the "evil eye" (Mariko, 1981).

Among the Bisa, zebra, eland, bushbuck and kudu were linked to prohibitions and human sickness and thus rarely hunted (Marks, 1976). Also, in recent times, among the Bisa, hippo flesh was associated with leprosy and only consumed in times of famine (Marks, 1984). Bisa people believed that people with leprosy

¹⁷ The process is called transmogrification (suggests a grotesque or preposterous metamorphosis) or lycanthropy (the assumption of the form and characteristics of a wolf held to be possible through witchcraft) (Webster, 1989).

turned themselves into hippo after death, and that whoever ate hippo meat could suffer from the same disease. It was also a symbol of cultural unity against outside authority, since most government workers ate hippo flesh (Marks, 1976). Traditionally it was also forbidden for Zulu to eat hippo (Ritter, 1955).

Among the Kavango of Namibia, the hunter who killed an animal was required to step on it and sing a song of praise to the animal. In the case of dangerous game, hunters drank a mouthful of blood that seeped from the wound. The hunter cut off the tail and after covering the prey took it home and placed it in a location reserved for offertories, along with his weapons and then took a rest. Weapons placed upside down indicated he had only wounded but not killed. Certain parts of the animals were offered to the ancestors (Hinz, 2003).

The Mbukushu (Hambukushu) and Geiriku of Namibia were required to hang the head of the prey so that the eyes were directed towards the successful hunter and his company (Hinz, 2003).

Among the Uukwambi (Owambo/Ovambo Group) of Namibia, it was taboo to kill female animals and no more than two animals could be killed per hunting group foray (Hinz, 2003).

Among the Mayeyi of Namibia, a boy could not go hunting or fishing without first informing his father, who in turn wished him luck by praying to the ancestors saying, ‘may the grass of the fields stay away from you,’ that is may the lions of the field not harm you. When an animal was killed, the head was brought to the father as symbol of respect and appreciation for the prayers that allowed him to kill. Failure to abide by these rules could result in a failure to kill, injury to the hunter and a loss of credibility in the community (Hinz, 2003).

Among the Baka Pygmies of Southeastern Cameroon and northwestern Congo Brazzaville along the Sangha River, the consumption of bongo (a large forest antelope) was/is taboo until undergoing certain rites. The hunter of the bongo is forbidden to eat it. He and his family must undergo special rites after killing the bongo or they can fall sick and die. Children from the same village as the hunter must also follow certain rites before they can safely consume the bongo or admire its skin. A pregnant woman can never eat bongo or her child will risk suffering from epilepsy or tetanus (Nkombe, 2004). Some areas believe that eating bongo causes leprosy. To demonstrate respect to the forest spirit/god, *Djengi* or *Jengui*, traditionally it is taboo for Baka Pygmies to hunt for more meat than they and their families can consume. They can also use meat to barter for basic needs (e.g., salt, tobacco, soap, etc.), but not in excess (Biko'o, *pers. comm.*; Nkombe, 2003). Hakimzumwami (2000) describes the respect of the Baka for *Djengi* and their fear of not being able to call *Djengi* if there is no bushmeat to sacrifice. If this taboo is broken, the hunting god/spirit “*Kosé*” will punish one by, for example having one killed by an animal while hunting and/or causing one’s death by a falling branch, or turning one into a *Mboa-Mboa* (evil spirit) which roams the forest (Nkombe, 2003). Other taboos among the Baka include (Nkombe, 2003; 2004):

- The hunter cannot bathe before the hunt, especially with soap (common sense as the perfume aromas from soap can be smelled from great distances by animals and, as any soldier knows, in war time by the opposing forces). He must retain his natural odor to which the animals and forest spirits are accustomed;
- It is forbidden to have sexual relations 24 hours before small game hunting (*la petite chasse*) and 4 days before dangerous game hunting in order to avoid becoming weakened physically, morally and spiritually or losing concentration;

- It is forbidden to have sexual relations during the preparation of poisoned arrows for the crossbows (*arbaletes*). Poison is primarily hétéroside and comes from the plant *Strophantus (Strophanthus) sarmentosus*.
- It is forbidden to hunt if one's wife is pregnant;
- It is forbidden to depart on a hunt for at least 2 days after a death in the band;
- The night before departure, the hunter must participate in all rites necessary for a successful hunt and safety during the hunt;
- It is forbidden to hunt dangerous game alone;
- The one who kills a big animal and his family do not consume it;
- A young hunter who is finally able to accompany the men in the forest must give his first horned viper to the elders of the band as a gift;
- If pregnant women eat the water chevrotain, this can result in their children suffering from whooping cough;
- The Yen clan cannot eat a fish called *Nyembé* without risk of death;
- The Yékéma clan cannot eat the monkeys: *Mongenjo (Hocheur*, or greater white-nosed monkey, *Cercopithecus nictitans*), the *Mambé* (DeBrazza's monkey - *Cercopithecus neglectus*) or the *Mongenjo/ Mongaidjo (Moustac* - mustached monkey, *Cercopithecus cephush*) without risk of death;
- The Yé Ndonga clan can not eat the *Seko/Ceko* (chimpanzee, *Pan troglodytes*) as it will make one become thin and consequently cause one's death. In addition, the *Seko/Ceko* protects the clan from all dangers and diseases. Could this be related to HIV/AIDS indicating that this disease has been around for a long time and recognized by certain groups as being associated with chimpanzees (see Chapter 5, Section 5.8.1, Linking HIV/AIDS To The Bushmeat Trade);
- The Yé Ndonga clan can eat neither boa nor cobra;
- Some clans cannot eat the *Bobo/Ebobo* (gorilla - *Gorilla gorilla*);
- It is forbidden to eat wild pig as this causes bad teeth;

- Eating turtles causes hemorrhoids;
- Eating the pangolin causes skin diseases; and
- During the period of circumcision, it is forbidden for young boys to consume gorilla.

Breaking these taboos could mean death and becoming an evil spirit, *Mboa-Mboa*, by a Baka Pygmy.

Among the Baka, the *Nganga* (witch doctor, spirit medium) possesses the “Holy Spirit” or “Fire Spirit” that can indicate where the animals that will be killed are in the forest. The hunters dance the *ébalé* while the *Nganga* kneels before the fire and predicts if the hunt will be successful or not. Once the *Nganga* “sees” the animal that will be killed, he performs the *Elambé* rite, which keeps the animal in that part of the forest where it has been discovered. It is at this point that women become important to this rite, as they start dancing the *yéyi*, which is believed to bring luck to the hunter and put the animals on the hunters’ path. They depose the *mosimbé* (bloody batons) of the forest spirit *Jengui* (*Djengi*) at the feet of the hunters that will guide them to the game. The women then have the hunters drink *njambu*, a potion made from honey water and leaves, which gives them courage. The hunters then cover their front and face with a potion consisting of powdered charcoal mixed in an oil, (*le molombi*), along with powdered bark of mahogany mixed with saliva. This is applied by the hunter’s wife. With her finger, she traces from the bottom of the nose to the top of the forehead to provide good luck and to make the hunter invisible. The god of invisibility is the *Mojoyi*. As noted above, it was taboo to hunt prior to carrying out these rites, aimed at directing and protecting the hunter while giving him courage. In the end, these rituals assure that the hunting god *Kosé* is pleased, will allow them success and to return unharmed. After a kill, the Baka dance to thank *Kosé* (Nkombe, 2003).

Traditionally, the *Tuma* (elephant hunter) was highly respected for his skills and the quantity of meat provided to the Baka band. In more recent times, ivory as a commercial product has also become prized providing cash to purchase the few modern items that the Baka might need in addition to alcohol and cigarettes. The Baka distinguish a number of elephant categories: 1) *Ya*: general name for an elephant, 2) new born male and female 3) male and female without tusks, 4) elephants coming into puberty that are not to be killed, 5) *Likombe*: female adult, 6) Male adult, 7) herd of elephants, 8) *Kamba or Ekoambé*: solitary elephant, 9) *Seme*: old solitary bull, 10) *Mokilakila, Mokila or Mokela*: or man transformed into elephant and 11) *Njabo*: largest “white” elephant that leads the herd – the father of all the elephants (*likpoyo*) with large feet, no toenails and enormous ivory. He is the elephant of “God” (*Komba*), a “me” (reincarnated spirit) of the great elephant hunter *Tibola* the son-in-law of *Komba*, son of *Nyabula* who called the elephants to put them on the hunters’ trail. *Komba* killed *Tibola* so his spirit *molili* could be transformed into a *njabo* and retransformed into the great forest spirit “*Jenguï*” (Nkombe, 2004).

On the other hand, the *Mokilakila* is a destructive force of sorcerers (*wa-mbu*) whose guild has no positive role to play in conservation. Initiation to become a *Mokilakila* takes about one year of living hidden in the bush, after which all initiates enter into a hut that is set on fire with those that leave unburned being true sorcerers who are capable of transformation, not only into elephant, but also *mokela* of leopard (*sua/les Hommes Leopard*), *le mokela* of elephant (*ya*), *le mokela* gorilla (*ébobo*), etc. These transformed sorcerers are said to be evil creating jealousy and negatively impacting hunting as a means of feeding one’s family and the Baka band. The *Nganga* combat the *mokela*. The *mokela* have remedies (*molombi*) to make themselves invisible, and something they swallow *ndambu na mokila* that allows them to know when hunters are about or other dangers. The *Mokilakila* has a partner, a man transformed into the “elephant’s

dog" (*bolo a ya*) whose role it is to guard the *Mokilakila* against hunters. If a hunter attacks the *Mokilakila*, the *bolo a ya* sticks the hunter with a spear, after which the elephant passes its tusks through the speared hole. If a hunter kills the *Mokilakila*, nearby will be found the body of a man, the *bolo a ya*. If a hunter kills a *Mokilakila*, an odor is released which can indicate to the hunter that this is what he has taken. A special potion poured on the excrement of the elephant will indicate if it is a *mokila*, as well if the cord of one's *samba* or *gris gris* tightens. It is for this reason that it is taboo to hunt alone (Nkombe, 2004).

In the initiation of a young *Mokilakila*, he is given the mission of killing a *tuma*, returning with the spear or gun of the hunter. The heads of this guild take the dead hunters genitals, heart and eyes and mix them into a potion, which they apply to the young *Mokilakila* to make him stronger (Nkombe, 2003).

Interestingly enough, Mariko (1981) discusses the "Leopard-Men", or *Hommes-Leopards* of Cameroon among the Bantu, a secret society that maintained law and order, prior to the coming of the white man's laws. Similarly, to the Baka, Westerners have depicted them as ritual killers, black gangsters or even sorcerers (Mariko, 1981). Among the Mpiemu, leopard were understood to be people who had marshaled the occult powers to transform themselves in order to kill other people (Giles-Vernick, 2002). Ongaro (1972 In: Mariko, 1981) met with them and heard their side of the story. They were/are warriors of *Bot ba Ngue*, creator and protector of the people. They considered themselves, within their domain, the secret police of Black Africa, who deal with those that a Western court has not or will never condemn. They were/are the armed wing of the traditional chiefs and have existed for 100s of years. They asked, "In the forest, if someone steals, tricks someone, kicks out his wife or beats his father, will the white man's law deal with such issues"? It is the *Hommes-Leopard* who avenged/avenge the abandoned woman, or a father beaten by a son. Locally, they were/are called

Bagenge, Nyangwat, Mayman, Wahokekoko and *Simba*. Their power came/comes from *Mbok*, the fetish that reconfirms the cinders of the primordial ancestors of their tribe. *Bot ba Ngue* is the head of the *Hommes-Leopards* and these men were/are his warriors. They are given this name as a totem because in the forest it is the leopard that is the most powerful. Similar to the Baka, Mariko (1981) speaks of a variety of transformations including *Hommes-Leopard*, *Hommes-Crocodile* among the cultures in Zaire and *Hommes-Simba* (lion) in Chad with a network forming an “Interpol” of traditional enforcers. A positive view of the *Hommes Leopard* appears to be primarily present among the Bassa ethnic group of Central Province, Cameroon and may reflect the perspectives of the Catholic priest Hebga (1968 *In:* Mariko, 1981), himself a Bassa. Other Bantu cultures in the area such as the Mpiemu have similar beliefs to those of the Baka, namely that those who can transform themselves are for the most part evil sorcerers, unless certain rites are forced on them to extract the evil, consequently turning them into healers (Biko'o, *pers. comm.*).¹⁸ In the early 1980s, an official court case in Cameroon was dismissed, after the one brother explained that he shot the other, who had transformed himself into a leopard, out of self-defense. The two brothers walked off arm in arm (Schneeberger, *pers. comm.*).

The Catholic priest, Hebga (1968 in Mariko, 1981) explained the “Pact of Blood”, where a man can be a blood brother to a leopard. For a Westerner there is the body and spirit. For the African there is:

- Body;
- Heart;
- Breath;

¹⁸ Similarly, around the Selous game Reserve in Tanzania, “simba-mtu”, are bad people taking on the appearance of a lion and killing people. Afterwards they change back into human form. It is useless to hunt down such lions, the only resort being the use of a powerful witchdoctor to get rid of them (Baldus, 2005 *In:* Baldus, 2005).

- Shadow; and
- *Hou* – a fifth element monopolized by the sorcerer, a mysterious and powerful force, which can be good or bad depending upon how it is used – such as being a blood brother with leopard.

A leopard is captured and a cut is made behind its ear, and with the same knife, a cut is made on the arm of the man and the two cuts are brought together and the blood of the man and leopard is mixed bringing about a life-long bond between the two. The leopard is then returned to the forest. If one is killed, the other will die. If the man calls, the leopard will come running. The leopard becomes like a guardian angel. Similar relations occur with snakes and people, and vultures and people, etc. The leopard can take the place of a man to punish a criminal. Hebga (1968 In: Mariko, 1981) explained that this is not a physical but psychological transformation, in which the man goes into a trance and something leaves his body and goes into the body of the leopard and he becomes a leopard. While his “spirit” is in the body of the leopard, his human body is inert and hidden away from everyone. The phenomenon is said to exist across the Sahel, the author observing in the village of Ndofane, Siné Saloum, Senegal the ritual “*Jeu du Faux Lion*” (Game of the False Lion) that occurred at the end of each harvest season. The village joined together playing tom-toms, while women chanted as one member of the village entered into a trance, becoming an aggressive lion and chasing after the villagers. No one would explain the significance of this important annual sacred ritual; it is possibly a taboo to divulge its secrets to an outsider.

In the same area of Cameroon, among the Bulu, the following taboos of consumption exist(ed) (Solly, 2002):

- It was/is forbidden to eat Yellow-backed duiker, *Cephalophus silvicultor*;

- It was/is forbidden to eat the *wo'o* (chimpanzee, *Pan troglodytes*) because it is like a person. Once again, can this be linked to the fact that long ago locals realized that HIV/AIDS was associated with this species;
- It was/is forbidden to eat the *ojoé* (royal antelope, *Neotragus pygmaeus*) by pregnant women since it can be found shaking and foaming at the mouth and can cause epilepsy in the child;
- It is forbidden for women and to young men who have not undertaken the *sô* initiation to consume *sô* (bay or black-striped duiker, *Cephalophus dorsalis*). There had been a festival for the *sô* each year ‘until God came,’ Christianity;
- It was/is forbidden for children to eat *kulu* (tortoise);
- It was/is forbidden during pregnancy to eat *mvaé* (African palm civet, *Nandinia binotata*) making the birth painful and/or causing weakness and dwarfism in infants;
- It was/is forbidden for women and children to eat *ezona* (bongo, *Tragelaphus euryceros*), giving them a skin disease;
- It was/is forbidden to pregnant women to eat *nyok* (tree dassie, *Dendrohyrax arboreus*), since consumption can result in a child born with three fingers; and
- It was/is forbidden to eat *ze* (panther), *akpwe* (Gaboon viper, *Bitis gabonica*) and *ngoé afan* (bush pig, *Potamochoerus porcus*), but no particular reasons were given.

There are about 208 ethnic groups in Cameroon, the majority being of Bantu origin. Many of these groups will have the same basic taboos, with variations from group to group. Among the Mpiemu ethnic group of the Sangha Basin that includes Southeastern Cameroon (Giles-Vernick, 2002):

- Women did not venture into the forest to trap game;

- New wives were never supposed to eat bushmeat or they would earn the reputation of being a thief;
- Pregnant women were not to consume meat from their husbands', in-laws', siblings' or fathers' traps (vegetative snares, pit traps, etc.), or the traps would capture no more game, and similarly, if they were to consume fish from their nets, these would then remain empty;
- Early Twentieth century women could never prepare or eat gorilla (*ntchilo*), because gorilla found women to be sexually attractive and would threaten them in the forest;
- Women could not eat *mpa* (possibly golden cat, *Profelis aurata*). Pregnant women eating *mpa* risked giving birth to girls without vaginas;
- Women could not eat *wago* (chimpanzee, *Pan troglodytes*) because this cause them to have children with nasty dispositions; and
- Women could not eat *koi* (leopard, *Panthera pardus*), which was considered evil and killed on sight.

Nkombe (*pers. comm.*) disagrees explaining that the taboo for the golden cat was over concern for a woman giving birth to hermaphrodites. According to Biko'o and Nkombe (*pers. comm.*), both Mpiemu, the above statements concerning both gorilla and chimpanzees are incorrect. Traditionally only men and pregnant women were allowed to eat gorilla and chimpanzee. The pregnant women could only eat the forearm of these primates in order to have a strong baby that walked early. Any woman breaking this taboo risked dying in trying to demonstrate she was equal to men.

Mariko (1981) states that taboos among many of the West African cultures contain hunting ethics, the protection of certain species, as well as social mores, for example 1) no hunting when one's wife is pregnant, 2) no hunting during wife's monthly period, 3) no adultery by one's wife while hunting, 4) not allowed

to have children until stop hunting at the age of 50, 5) no killing of pregnant female, 6) the roan, *Hippotragus equines* or “horse antelope”/(*antilope cheval*) is protected as the mount of the genies, and 7) warthog are protected by Moslem hunters. Taboos of apprentice Hunters included (Mariko, 1981): 1) never shooting until the “master hunter” tells him to do so, 2) never tricking another hunter, and 3) no sexual relations with the wife, daughter, sister or friend of another hunter (Mariko, 1981). Signs of breaking a taboo included: 1) if when hunting, a hunter finds a male animal mounting a female, he knows that his wife is cheating on him, and 2) if an elephant or other dangerous game charges a hunter, this indicates betrayal by his wife (Mariko, 1981).

Among the Bakongo, to preserve the nimrodian blood in his veins, the man who kills a beast must eat its heart, sharing it only with his wife. For the same reason, they also eat the head and the neck. The wife must eat the part where the tail joins the small of the back to assure her husband’s hunting prowess. A hunter must always carry a bag of salt, to give the genies if he encounters them, so as not to be imprisoned by them. There must be no adultery by a man with a gun, or his wife. If a man habitually misses his quarry, he is guilty. If a hunter suspects his wife, he should perform specific rituals, and if afterwards he manages to kill the prey with his first shot this indicates that the wife is innocent, while consistently missing indicates otherwise (Claridge, 1922).

Similarly, Marks (1976) notes among the Bisa that concern over the welfare of a hunter also forced social mores and taboos on non-hunting family members and relatives in the villages. The behavior of their prey told them if their family in the village was remaining within expected norms. Elephants copulating indicated adultery and elephants lying down indicated mourning in the village. “The elephant never lies”, was their belief and any unusual behavior of the elephant observed by the hunters could result in an aborted hunt and a return to their camps

or villages for divination (insight) into the cause (Marks, 1976). This would most likely be accomplished through some kind of contact or sign from the ancestors or spirits. Hunting would resume once the cause of the behavior was understood and resolved.

Among the G/wi Bushmen in Botswana, animals are *kx'oxudzi* (things to be eaten), *N!Adima's* (God's) creatures that may only be killed in defense or for food. Older animals were/are to be hunted while pregnant females and even males during the breeding season were/are not hunted (Madzwamuse & Fabricius, 2004, *In:* Fabricius, *et al.*, 2004). Among the !Kung Bushmen of the Kalahari, only unfertile ostrich eggs were/are selected from a clutch, the ones with chicks being left to hatch (Wannenburgh, Johnson & Bannister, 1979 *In:* Smith, 1992).

Thus only those were allowed to hunt who had gone through a hunting apprenticeship lasting three to six years and/or had been raised in a hunter gatherer culture (e.g., Bushmen, Pygmies), and thus knew the secret rituals needed to overcome evil forces. It was taboo and a death sentence was the fate of any “unqualified” individual, possibly his family and maybe even his lineage, if he hunted. Thus, such taboos limited access to wildlife to only those individuals who had apprenticed and to whom the elders had passed on the “secrets” of how to survive the hunt.

2.1.9 Role of Women in Controlling Access to Wildlife

As noted with the Baka Pygmies, in the forest areas of Cameroon, the majority of hunting rites are controlled by women, the symbols of fertility who transmit these attributes to the forest to assure successful hunting (Nkombe, 2004). Among the Mpiemu (Mpiemu) of the Sangha Basin that includes portions of Cameroon, Central African Republic and Congo and overlaps with the Baka, women made

critical contributions to the capture, preparation and consumption of game. Women performed a secret dance when fish or meat was scarce. A pregnant woman chewed on dried maize kernels (*shogo*), spitting the maize and saliva on her husband's left hand and forehead (*Mpombi*, the bodily site of fortune) in order to safeguard the productivity of his hunting and farming activities. To moderate the anger of the *abumi* (fetus), a pregnant woman could tie a cord (*purokando*) around her husband's wrist to ensure a successful hunt (Giles-Vernick, 2002). According to Biko'o and Nkombe (*pers. comm.*), *abumi* refers to a women being pregnant, and *Mbodô* means fetus. In addition, the ritual of mixing maize and saliva on the husband's forehead is not just for hunting and farming, but also for fishing and, in general, good luck. Men can also undertake this ritual on other men for good luck. According to Biko'o and Nkombe (*pers. comm.*), the only hunting ritual undertaken by women with child among the Mpiemu is when hunting large game with nets (*la chasse au filet*). This woman with her baby (after born) would accompany the hunters to a site in the forest where the hunt was to commence. They would form a circle of medicinal herbs with the woman and child in the center. They would then pray to *Mekere*. The hunters would then disperse for their hunt, while the woman and child would be required to remain in the center of the circle until the hunters returned. This form of hunting and ritual ended about 30 years ago.

The founding ancestor of the Chiota chieftancy, Zimbabwe, is reputed to have been a hunter who brought with him his virgin sister Nyemba, who was capable of performing magic. Her magic restricted the roving elephants, permitting hunters to come upon and hamstring them (Posselt, 1924 *In:* Ranger, 2003 *In:* Beinart & McGregor, 2003). Anemasvu was believed to be the niece of the male spirit Chingowo, when the forebears of Chief Nyachuru arrived in the Concession District of Zimbabwe. When she died and was buried, her spirit entered wild

dogs and they became like domestic dogs, chasing buck into the houses of her people (Ranger, 2003 *In: Beinart & McGregor, 2003*).

2.1.10 Sport and Commercial Hunting

While the majority of game was harvested for meat, game also served a multitude of purposes, including sport and commercial uses. Human populations were low relative to the game and the weapons relatively primitive [e.g., poisoned bows and arrows, crossbows (*arbaletes*) (Figure 2.3), game pits, dead falls, and much later blackpowder muskets] so that the above traditional controls, with few exceptions, were more than adequate to assure sustainability.

2.1.10.1 Hunting for sport

Sport hunting appears to have been popular for recreational purposes, as a sign of bravery and as proof of manhood. Being under the control of chiefs and elders, its harvests were believed to be sustainable. Examples from across the continent include:

Wata “Elephant People”, Kenya

Lions and leopards were hunted to demonstrate bravery (Parker & Amin, 1983).

Maasai

Among the Maasai (Mbarnoti, 2003), the hunting of a lion usually takes place after it has killed a cow and/or as a demonstration of bravery. Hunting tends to take place in a group that encircles the lion. Generally, only *morani* (warrior age class males) hunted lion. *Morani* form an age class of 18-35 years, marking the

beginning of adulthood after circumcision; both men and women are circumcised. Men at this age raid cattle, herd cattle, protect society against invading tribes and marry. The first *morani* to draw blood with his spear is considered to “have killed the lion”. His trophy of the hunt is the tail. The second person to draw blood gets the front paw as his trophy. The lion is not eaten and the pelt is not tanned. This is considered by the Maasai as a form of “Sport Hunting”! The *morani* find great pleasure in the chase, the danger and the demonstration of their manhood and masculinity, as do many modern day sport hunters. A successful *morani* lion hunter is favored by the women much as a rugby or football star in the Western culture and this can lead to one being appointed by the committee of elders as an age group leader (*Alaigwanani*).

Zulu, KwaZulu-Natal

The classical work by Ritter (1955) talks of Shaka, the Zulu chief as a herd boy of 16 in 1803 acquiring “several light hunting assegais ‘*isipapa*’ ” and a small cow-hide shield. He spent much of his time throwing these spears until he could strike a tuft of grass with two throws out of three at 46 meters (50 yards), and moving objects after which he hunted rabbits and small buck. He killed his first leopard at 19 with a spear and club. By 1819, Shaka organized a royal hunt for elephant and other game between the White and Black Umfolozi Rivers. A hunt master and deputies orchestrated the hunt. Shaka considered the Bushmen-inherited *impinge* (spear) covered with poison unmanly, preferring the dangerous sport of getting close to and hamstringing the elephant with tomahawk-like axes. With a combination of hunters and soldiers (*impis*), a series of game pits and fences was used to funnel driven game past awaiting spearmen. Elephant and rhino were hamstrung, while antelope, buffalo, leopard and lion were speared. Upon two of his men saving Shaka from an elephant charge by giving their life, Shaka remarked, “ ‘They were the bravest of the brave....I can but reward their kraals

now and give a sacrifice to the spirits of the ancestors and mine' " (Ritter, 1955)

Eight years later 48 elephant were speared on a royal hunt organized by Shaka. Like the Maasai, described above, this appears to have had a certain amount of significance in proving ones manliness, which from a Eurocentric point of view we would call "sporting" (Chapter 3). Certainly, whatever one calls it, the Zulu enjoyed the pursuit of game as did people all over Africa, then and now.

The Ndebele/Zulu, Bulawayo

"In response to the destruction of wildlife by the early European adventurer hunter gatherers, some African rulers set up rudimentary management systems in an effort to save wild animals from extinction. Thus, Mzilikazi (the Zulu known for his hunting prowess) introduced a permit system for all European hunter gatherers in his kingdom. Under this system, gifts and other presents were given to the king in return for permission to hunt in his territory. The king also levied a percentage of the spoils of the hunt as payment for the permission" (Murombedzi, 2003).

Mzilikazi's successor, his son Lobengula, a great hunter in his youth, charged a gun fee and ammunition to all white hunters who were only allowed to hunt in the periphery of his territory. On the other hand, preferential treatment was given to Ndebele hunters, many of whom by the mid-1800s were hunting as much commercially (ivory) as for sport, taking more ivory than the Europeans. Lobengula forbade killing cow elephants or taking ostrich eggs and did so as a conservation measure. In 1833, he fined the famed elephant hunter Fredrick Courtney Selous, after whom Tanzania's Selous Game Reserve (SGR) is named, and others for shooting hippos against his wishes (MacKenzie, 1997).

The Tswana, Bechuanaland

Similarly, Khama, King of the Tswana controlled and loved hunting. He became so alarmed at the decline in game that he imposed hunting restrictions on the northern and western parts of his territory. Boer hunters were not permitted to enter and even “ ‘Englishmen have to obtain permission.’ ‘The hunting parties of the tribe....are regulated by the chief himself’ ” (Mackenzie, 1997). The importance of hunting to the Tswana is represented in a letter he wrote to the British after the annexation of Bechuanaland (Botswana), when he explained that the three things in the country that his people enjoyed were: 1) cultivated lands, 2) cattle stations and 3) their hunting grounds. He was concerned that the game would become extinct, but requested that as long as it was his country that his people should be allowed to hunt (Mackenzie, 1997). Even in the 21st century, citizen hunting, with legal government permits, is considered an inalienable right of all Botswanans, though as will be seen in the next chapter, “special licenses” for traditional hunters and gatherers have become a problem.

The Ila, Zambia

During the annual *chila* in pre-independent Northern Rhodesia (now Zambia), massed hunting with dogs and spears by the Ila brought down Kafue Lechwe (*Kobus leche kafuensis*) in the hundreds, which may have produced meat, but those who witnessed it also saw the evident enjoyment of its participants (Clarke, 2001). Lechwe herds were migratory and thus did not stay within designated village boundaries (*chichi*). “In order to secure what is called ‘optimal foraging’ in hunter studies, the inhabitants of each of the chiefdoms Mungaila, Nalubamba, Hamusonde and Chongo as well as the local Batwa Pygmies were called once or twice a year between April and May for a collective hunting time, lasting three days (the *chila*)” (Haller, 2004). It was restricted by the 1950s and forbidden

before the end of colonialism (Haller, 2004; Siamudaala, Muma, Munang'andu & Mulumba, 2005 *In: Osofsky, Cleaveland, Karesh, Kock, Nyhus, Starr & Yang, 2005*).

2.1.10.2 Commercial hunting

Traditionally, wildlife was also used for commercial purposes over much of Africa and traded with the outside world. Parker and Amin (1983) estimate that at the outset of white traders' contacts with Sub-Saharan Africa, about 300 tons of ivory left Africa annually. They estimated that initially a large percentage of this was "pick-up" ivory from an annual mortality rate of from 5-10% of which half of this would produce tusks, the other half being baby elephants. Thus, with low human populations, a passive management existed that resulted in some harvesting of elephants; however, a large amount was collected from natural die offs. Examples from across the continent include:

The Zulu of South Africa

Wildlife was hunted for its ivory by the Zulu and sold to 17th and 18th century Dutch settlers. It was important in the domestic economy supplying food, clothing and artifacts (Mackenzie, 1997).

The Sotho

Sotho settlements in what is now South Africa may have resulted from trade in animal products, such as skins, karosses, feathers, ivory and metals. The positioning of the settlement was linked to the availability of metal and trade routes to which they could channel their hunting products. They were highly

skilled in ivory carving and leatherwork (Wilson & Thomson, 1969 *In: Mackenzie*, 1997).

The Waliangulu of Kenya

In Kenya, in the region of today's Tsavo National Park, the Waliangulu, Liangulu or Wata as they call themselves, were a little known tribe of perhaps a few thousand people who commercially hunted elephant for ivory with up to 150 pound long bows and poisoned arrows (Holman 1967; Parker & Amin, 1983; Kassam & Bashuna, 2002). A significant percentage of their ivory was "pick-up" from the natural die off of elephant (Parker & Amin, 1983). It is thought that the Wata may belong to a very ancient hunting-stock that traded ivory with ancient Egyptian, Greek and Roman expeditions to the region (Kassam & Bashuna, 2002). Parker & Amin (1983) believe that the Wata were the most likely source of much of East African ivory dating back 1,200 years ago. The Waliangulu and their demise are discussed more in the Chapter 3, Section 3.9.1, Eco-Genocide and the Elephant People.

Zambezi Delta (now of Mozambique)

Between the 12th and 14th centuries, Swahili and Indian traders reached the delta and began exporting ivory and skins, greatly reducing the concentration of large herbivores, particularly elephant and hippo, from the region. Toward the end of the 19th century, the human delta population reached 100,000 and the ivory trade began waning due to the near extirpation of hippo and elephant from the delta (Beilfuss, Bento, Moore & Dutton, 2001).

Zanzibar, Ivory, the Slave Trade and the Great Lakes Region

With elephant populations devastated on the East African plateaus, the Arab traders began looking to the Great Lakes region, where elephant were still abundant (Chrétien, 2003). In the mid-1800s, working out of Zanzibar ruled by the Sultan of Oman, Hamed bin Mohammed, better known as “Tippu Tip” traded ivory and slaves for guns, using slaves to carry out the ivory. Both were sold (Brode, 2000). Tippu Tip took control of an area between the Lomani and Lualaba Rivers, making his headquarters in Kasongo in what is today a wildlife reserve in modern Democratic Republic of Congo (old Zaire/*Congo Belge*). As paramount chief among the Bantu cultivators and chosen governor among the Arab traders, he imposed taxes, built roads and plantations, and regulated elephant hunting (July, 1970). Ivory provided traders with a 200% profit.

In Bunyoro and Buganda (Uganda), ivory was a royal monopoly with half the tusks going to the kings. The main beneficiaries of this external commerce were the sovereigns and their aristocratic entourages. Towards the end of the 19th century, this resulted in the development of predatory politics, ivory and slaves being collected from peripheral areas of these kingdoms. The kings, Mutesa of Buganda and Kabarega of Bunyoro had their own armed elephant-hunting troops north of the Nile River and around Mount Elgon. These troops were organized into permanent infantry bodies, and with firearms became despotism’s new tool, resulting in the emergence of “Big Men” able to break traditional rules. Both Buganda and Rwanda participated in the slave trade from the 1880s into the early 20th century, slaves mainly coming from the divided populations of the Upper Nile and what is today the eastern Congo (Chrétien, 2003).

West Africa

The slave trade was by the Portuguese, from the 15th century until about 1800 when Britain outlawed slavery. Slaves were exported along with the ivory they carried out of the interior from Senegal to Angola (Parker & Amin, 1983) (see Chapter 3, Section 3.1.7.2, Cultural genocide).

2.2 TRADITIONAL FISHERIES MANAGEMENT

Fisheries were managed as a “Common Property Resource”, closely integrated into the culture and traditions of the communities. Fish provided important food and income for the people and there was an agreement among the users that fishery resources had to be managed judiciously and in a sustainable manner. Clan elders, in various capacities linked to the chief who had overall responsibilities for the community’s resources, were responsible for this management. Fishing was primarily for subsistence, but occasionally the fish would be bartered for agricultural goods.

2.2.1 Access to Fish Stocks, Chiefs, Lineages and Territories

Both floodplains and rivers were divided into sections under control of chiefs representing lineages.

The sedentary Kotoko ethnic group controlled fishing on the Logone River (Loth, 2004). Along the Logone River of Chad, a *chef de marigot*,¹⁹ closely allied to a number of families or villages, controlled/controls access to fishing on the floodplains. *Chefs de pêche* (fishing chief), had/have jurisdiction over a section of the main river channel belonging to a village (Dadnadji & van Wetten, 1993).

¹⁹ *Marigot* may be described as a distributary and/or side-channel leading on and off the floodplains from the main river channel

Along the Inland Delta of the Niger River (modern Mali), under Fulani rule of the 19th Century, resources were traditionally managed under a common property system called *Dina*. The principal Fulani manager was the *Dioro*, who was the head of the founding lineage of the clan. The founding lineages were the inalienable owners of resources. Heads of these lineages were called "sacrificers" with delimited territory. Each lineage had a "Master of the Water", who controlled access to and managed fishery resources. Resource managers carried out their function in consultation with the *council of elders* comprised of heads of other lineages making up the community (Moorehead, 1994). As noted, access to the multiple use of the diverse resources on these floodplains (farming, pasturage, fisheries, etc.) was strictly divided among ethnic groups (see Section, 2.1.4.3, Territory and resource management along the Inner Delta of Niger and Section, 2.2.3, Taboos) as well as clans.

Similarly, along the Niger River in Nigeria, fishermen "participate actively in the management and or co-management of the aquatic resources with the Local Water Chiefs called *Bulamas* or *Sarkin Ruwa*" (Læ, Williams, Malam, Morand & Mikolasek, 2003).

As regards Lake Victoria, in pre-colonial times, during the colonial period and even up to the early 1970s, the local fishermen felt the lake was theirs and sustainably managed the fishery resources. They developed rules about who should fish and when, where and what kind of fishing gear could be employed, based on their own accumulated experience. Similarly, to the floodplain ecosystems mentioned above, along Lake Victoria, Kenya, traditionally the management system in the pre-colonial and colonial period was based on territorial user rights. These rights were vested in the clan elder, whose jurisdiction was not only on land, but also covered the water near shore (Owino,

1999; Mutunga, 2002). Similar arrangements existed along rivers (Owino, 1999). The water beyond the clan area (deeper offshore waters) was considered “open access”, and anyone could fish within it, though access was limited by gear technology (Owino, 1999).

2.2.2 Management Interventions

2.2.2.1 Monitoring

Under the following system of fishery control, over-fishing of migratory and non-migratory species was prevented. Along the Logone River of Chad, the *chef de marigot* monitored fish yields and fish stocks on the floodplains, while the *chef de pêche* did the same in the main river channel. At the end of March, after a successful sample catch, the *chef de village* and the *chef de pêche* invited villagers and inhabitants from surrounding settlements to join in the collective fishing in the river (Dadnadji & van Wetten., 1993).

2.2.2.2 Habitat Manipulation

Among the //Anikhwe River Bushmen of Botswana, once the ponded areas on the floodplain were fished out and dried out, the men burned the dried vegetation in and around the pond so that at the next flood, the fish would have something to eat. In essence, they helped to recycle nutrients between the terrestrial and aquatic environments. This also provided a flush of fresh green grass for the livestock and wildlife (Ngaka, 2003).

2.2.2.3 Gear restrictions and use to control fishing pressure

Throughout history, the different communities of fishermen in the Sahel have learned to exploit the cycle of the floodplain fishery by allowing the spawning migration to go through virtually without intervention, and by concentrating their effort on the fish trying to regain the permanent waters of the riverbed. Many techniques exist for the blocking of the return channels with different devices. There is a very clear relationship between flood magnitude and duration linked to the annual yield/catch of fish, estimated at around 50-60 kg/ha/year of floodplain (GFCC, 1980; Hamerlynck, Duvail & Ould Baba, 2000).

On Lake Victoria, along the Kenya shoreline, there was a restriction on canoe ownership and fishing gear as a means of controlling fishing pressure. Only two fishermen were allowed to own and operate beach seine nets on one beach. These two people had to possess high moral values as a prerequisite for acceptance. Morality in this context meant freely giving fish to community members who did not have fishing gear (Owino, 1999). As with wildlife, fish was an important source of protein and, like hunters and game, it was shared freely with community members as part of a social network, where priority was placed on the welfare of the group as opposed to the individual. As with wildlife, access to fishery resources was traditionally restricted to limited individuals.

2.2.2.4 Fishing seasons

Along the Logone River, the *chef de marigot* closed/closes fishing in *marigots* from December until the beginning of April in order to enable the remaining fish stocks to recover so when the floods return, there would be/are enough fish remaining in the marigots to allow the next cycle of reproduction and growth to take place. Only in exceptional cases, when the marigots dried out, would

permission be given for villagers to harvest what would otherwise be a lost protein resource. The *chef de pêche* enforced/s a ban on fisheries in certain stretches of the main river from December until the end of March. By maintaining the ban in certain parts of the river until water levels started/start to rise in April, the presence of spawning fish at the beginning of the flood period was/is ensured, thus guaranteeing the annual influx of fish to the floodplains (Dadnadji & van Wetten, 1993). In Lake Victoria, clan elders enforced strict observation of closed seasons from February to May during the long rains, and from October to December, during the short rains, which they believed to be fish breeding seasons. This traditional knowledge has been proven valid by modern fishery biologists (Owino, 1999). Among the Uukwaluudhi (Owambo Group) of Namibia, permission to fish was required from the king who allowed an open season from August to September. Thereafter the season was closed during the reproductive season (Hinz, 2003). Among the Khoikhoi (Khoi) of the Western Cape in South Africa, the transhumance cycle revolved around a combination of pasture and marine resources, primarily shellfish and seals. During the winter rainfall (April to September), they would move to the coast for both pasture and seafood. By October, they moved inland to graze on the riparian pasture along the Berg River. Fear of over-grazing and restricted pasture nutrients (deficits in certain trace elements such as phosphorous, copper, molybdenum and cobalt) were a major reason for this continued mobility, with all basic needs carried on the backs of oxen (Smith, 1992).

2.2.2.5 Nursery grounds

Along the Logone River, from December to the end of March, each village built an enclosure in the river and dumped in refuse to provide food and a breeding area for non-migratory fish, while migrating fish from Lake Chad were provided with a protective habitat in which to spawn while awaiting the floods (Dadnadji &

van Wetten, 1993; Loth, 2004). In order to assure young-of-the-year recruitment and thus sustainable fish yields, fishermen at Georgetown, the Gambia, have traditionally prohibited fishing from certain areas (swamps) during times of the year when these serve as critical nursery grounds (DeGeorges, 1992b).

2.2.3 Fishing Taboos

By Taboo/law, in the Inland Delta of the Niger River, occupations were ethnically divided. Fulani cattlemen were forbidden to fish, this being the responsibility of Bozo and other fishing groups, while fishermen who wished to keep cattle were required to employ Fulani herdsmen. This created a division of labor and specialties among various groups with strong social and economic ties necessary for survival (Tré-Hardy, 1997).

Among the Tonga of the Zambezi River, it was taboo to fish sacred pools unless receiving permission from those responsible for the *malende* shrine (McGregor, 2003 *In:* Beinart & McGregor, 2003).

Among the Topnaar of Namibia, the night before fishing a man could not sleep with his wife, nor could a man eat fish while his wife was menstruating. The wife could not pay visits and walk about much “ ‘otherwise the fish would swim around too’ ” and he would catch little or nothing (Hinz, 2003). She was required to stay in the house with closed doors. While the husband was fishing, cold water could not be thrown on the fire (Hinz, 2003). Obviously, as with wildlife, while the husband was away fishing, taboos acted/act as a social control to keep the wife faithful.

Among the Mayeyi of Namibia, the first fish killed had to be left on the bank for the ancestors (Hinz, 2003).

In the Ankazomborona Fokotany, Madagascar, *Fadys* (taboos) control access to and thus pressure on the freshwater inland fisheries. Throughout the area, traditionally Tuesdays and Thursdays were days of rest in which no major activity of manual labor was to be undertaken. At the Fokotany of Ambato-Boeni, the fishermen spoke of a lake where it was taboo for anyone to fish commercially. This lake was set-aside for local communities to supply themselves with protein (Rajonson, DeGeorges & Booth, 1991).

2.2.4 Control of Fishing Access by Non-Community Members

On the Inland Delta of the Niger, visiting fishermen paid the “sacrificer” to sacrifice for them when they arrived in his area. They paid “in kind”²⁰ for permission to fish (Moorehead, 1994). Along the Kenyan shores of Lake Victoria, outsiders (immigrant fishermen) were compelled to seek permission from clan elders to set their equipment in clan waters. They had to give details of where they had come from and declare the type and number of their fishing gears. They also had to report to the clan elders before embarking on fishing activities and had to be settled within the local community. In so doing, the migrant fisherman was integrated into the culture and traditions of the local community, especially those safeguarding fishing activities. He had no alternative but to adhere to these rules and regulations (Owino, 1999). Among the Mafwe, Masubia and Mayeyi of Namibia, if a stranger wished to fish, he/she had to approach the village *indunas* (*kuta*) and apply for permission. The *indunas* assembled the community and they decided together if permission should be given. Illegal fishing could result in the fine of one head of cattle (Hinz, 2003).

²⁰ Goods or commodities as distinguished from money (e.g., a portion of caught fish).

2.3 TRADITIONAL MANAGEMENT OF LAND, AGRICULTURAL AND PASTURE

Land, like the other resources over most of Africa, belonged to the ancestors who delegated authority over access to and use of the land to the chief of the community. Land was to be managed as a “Common Property Resource” for the good of the community.

2.3.1 Land

By the 1700s, much of the Great Lakes region (present day Rwanda, Burundi, Uganda and western Tanzania) was divided into kingdoms and eventually monarchies. Territorial division within a kingdom/monarchy was subdivided into a province (chiefdom under colonialism) and locality. In Burundi, under the king were the chiefs (*batware*) and delegates (*vyariho*), who controlled access to agricultural and pastoral lands, among other resources. In Rwanda, there were three local authorities; army chiefs, pasture/cow chiefs and land chiefs. Under these three were “hill chiefs”, linked to powerful lineages and clans, who closely controlled the local populations and who either inherited their positions and/or were chosen by the local populace for their moral authority, wisdom and social skills. In Buganda, the *saza* (county) was modeled on traditional clan territories. Clan chiefs eventually became marginalized in the 18th century when the king (*kabaka*) appointed “chiefs of the county”, thereby redefining hill (clan) chiefs, who now had a stronger allegiance to the king than to their own people (Chrétien, 2003).

The Luhya of Kenya were divided into 20 clans, each claiming a given territory. Rights to land depended upon membership in a patrilineal descent group of clans

and sub-clans. Elders, who provided authority, were recognized for each clan and sub-clan (Mair, 1977).

Among the southern Bantu-speaking people, all land belonged to the chief and could not be alienated. Once a man was allocated a field, he had the right to exclusive use of it as long as he and his wife maintained it under cultivation. The produce of the field belonged to the cultivator, and, more precisely, the “house of the wife”, as she needed to give approval prior to the husband disposing of the produce. After harvest, and before the next planting season, the field temporarily became common property for communal grazing. Depending on the availability of water, as well as traditional practices, groups might be spread out over the landscape such as the Zulu, or concentrated in villages, such as the Sotho and Venda, which in turn affected the structure of the political administrative system: chief, sub-chief and headmen among the Zulu and a single chief among the Sotho and Venda (Hammond-Tooke, 1993).

Among the Bisa of the Luangwa Valley of Zambia, the chief allocated land, though people could settle anywhere there was available land and then advise the chief. Land surrounding the village belonged to the community, but cultivated fields belonged to individuals, subject to overriding rights by the community, which owned the land. Land not under cultivation remained common property, open to anyone’s use for prospective fields, collecting firewood, hunting and gathering (Marks, 1984).

Zimbabweans (Shona and Ndebele) derive their social identity from the soil of the land and are related to it as a baby to its mother. Land is sacred and a focal spiritual point of social identity. Without land, there can be no being. Land is about things other than monetary value. It is about the soul of the people. Land is inalienably theirs. Land is excluded from reciprocal exchange. One cannot own

land. It is a communal entity that is returned to the group one's death. It is a birthright that extends to ancestral rights. Boundaries are loose and fluid as opposed to rigid (Holland, 2001). The ancestors, accessed through spirit mediums, were and are considered the ultimate authority over land. Territorial spirits (*Mhondoro*) are royal ancestors of past chiefs believed to be the real owners of the land in Zimbabwe, protecting the fertility of the land and controlling rainfall. The goddess Nehanda and the god Chaminuka are the most powerful of the *Mhondoro*. Support from the *Mhondoro*, be it for agriculture or war, is secured through rituals of appeasement, the most important being *kutamba guva*, a dance on the grave, which is performed within a year of a chief's death. Here the ancestor is led symbolically back to his home out of the bush, where he has been living as an animal, *Mhondoro* means lion; it is believed that the chief's spirit makes its way into the body of a lion immediately after his death and then lives in the bush. The *Mhondoro* control vast tracts of land (Holland, 2001).

The Darfur region of western Sudan along the Chad border is a hot bed of friction between nomads and sedentary farmers since 2004. Historically, the indigenous groups and earlier settled Arab migrants each had their own *Dar* (tribal homeland or traditional management area). The major tribes voluntarily agreed to the settlement of other groups and accorded them a recognized administrative status (ICG, 2004). Disputes between nomads and farmers were resolved through negotiations between traditional leaders on both sides, compensation for lost crops and agreements on the timing and routes for the annual migration (Human Rights Watch, 2004).

In northern Ghana, land is believed to be the abode of the ancestors, considered sacred and meant to be passed on to future generations. The “earth priest” (Same as “*chef de terre*” in Francophone countries) or the chief controlled access to land and associated resources. In areas where land was limited, it could be inherited;

in patrilineal societies it went from father to son (Tonah, 2002). Similarly, while the chief allocated land, among the Hambukushu of the Okavango Delta, land could also be inherited by the eldest son (Mangurunga, 2003).

In the Ivory Coast, the land was communally managed, with the idea of this land being passed on to the next generation. Special rites, necessary to utilize the land, were passed from one generation to the next. Traditional society had a “master of the land and sacred forests” (*sakosé* among the Koulango, *tarfolo* among the Sénoufo and *amoinsokoé* among the Baoulé, etc.) to control access to these resources and who enforced observance of ancestral customs and celebration of traditional rites (Ibo, 1994). In southern Ivory Coast, societies were not hierarchical in nature, consisting of small-scale, widely dispersed chiefdoms, as tends to be the case in more forested environments.

However, in the 1890s Samouri Touré [See Chapter 1, Section 1.4.5.4, Samouri Touré, Dioula (Dyula) Mandinka], the last of West Africa’s empire builders, descended out of Guinea-Conakry to conquer and occupy what is now northern Ivory Coast. Residents fled much of the countryside seeking protection of the Sénoufo chief, Gbon Coulibaly, whose jurisdiction centered around Korhogo, a town that still exists today. Touré arranged, through indirect rule, to allow Coulibaly and existing structures of the chieftancy to continue ruling this area. This would eventually be taken over by the next invaders, the French who defeated Samouri in 1898. Land was the source of political authority. Chieftaincies were controlled by senior males of the Sénoufo founding lineages. Land chiefs (*tarfolo*) granted land for new villages within the lineage’s territory, which in turn paid tribute to the dominant lineage in kind and in labor. Some called this system semi-feudal. At the village level, sub-chiefs or headmen represented the *tarfolo*, creating a chain of command and political cohesion in a well structured hierarchy that fitted into power sharing relations with invading

conquerors such as Samouri Touré and the French. Each village had a portion of the lands farmed communally with the harvest being stored in common granaries. Distribution of grain was controlled by the local subchief to assure subsistence for the community. Male elders (chiefs, headmen and lineage heads) and married women with children had the right to some private land, which they could farm several days a week. Young men, marriage taking place at about age 35, provided communal labor with no right to private land. This system was considered a gerontocracy in which elders controlled the land, access to women (when a young man could marry) and the labor supply. With the exception of women, non-Sénoufo and descendants of slaves, all married men could reach the status of elders. Youth societies called *Poros* and village-level sacred forests played an important role in communal unity. During the last seven years of the 21 year initiation phase, *Poros* supplied youth to till the fields of the elders. On the death of the village head, they were required to reapply for permission to occupy the land from the *tarfolo*, reinforcing the authority of the chieftaincies of central villages over settler villages (Boone, 2003).

The *Dina* system of land management in the Inner Delta of the Niger River and land management along the Senegal River have already been described respectively in Section 2.1.4.3 (Territory and resource management along Inner Delta Of Niger) and Section 2.1.4.4 (Territory and resource management along the Middle Valley of the Senegal River).

“Originally, land tenure in Niger’s agropastoral area was characterized by the existence of three different types of tenure status. Up to the time of independence, landowners—composed of aristocratic and warrior families (village chief and their lineage, and canton chiefs and their lineage)—held a primary-ownership right. They could allocate land and receive tithe payment. Their control over land was attributed to the fact that they were members of the families who arrived first on the land considered. Use-right holders formed a second group. Having a secondary-ownership

right (they received land from the village and canton chiefs), they had to pay tithes. Their use right was secure and could be inherited by their children. A third group was formed by tenant farmers renting fields, who were vulnerable because the owner could reclaim his field at any time" (Ngaido, 1993 *In:* Vanderlinde, 2000 *In:* McCarthy, Swallow, Kirk & Hazell, 2000, Excerpted with permission from the International Food Policy Research Institute).

Among the Fulani *Lamido de Rey-Bouba* in the Bénoué Valley of northern Cameroon, the *Lamido* with both religious and secular powers due to his divine kinship linked to the Muslim religion, controlled/controls access to all resources. In his *faddah* (court), there is a *galdima* (controller of agricultural land) and "sarkin sanu" (controller over cattle and grazing) (Mayaka, 2002).

Among the Mpiemu of the Sangha Basin of French Equatorial Africa/*Afrique Équatoriale Francaise* (AEF), the *Nkang* (*Ngang/Nganga*) or diviner/healer controlled the distribution of farmland and meat (Giles-Vernick, 2002). According to Biko'o (*pers. comm.*), the distribution of land is controlled today at the level of the extended family/clan within a village.

As discussed, among the Ju//Hoansi Of Nyae Nyae (Eastern Bushmanland), residential and resource user rights were inherited from one's parents or gained through marital ties linked to a *N!ore* (territory). The size and shape of the *N!ore* was basically determined by the distribution of bush foods around the water, which are close enough for people in the *!kwana* (settlement) to get to and gather, before returning to the *!kwana* by nightfall. The plural of *N!ore* is *N!oresi*. Specific groups of Ju/'hoansi owned the *N!oresi* in the Nyae Nyae region (Eastern Tsumkwe District) (Marshall & Ritchie, 2003). It is these owners that outsiders would approach for permission to use resources or to move into the territory (Hitchcock, 2000a).

The necessity of having access to permanent waters (there were seven permanent and 94 semi-permanent waterholes in the *Nyae Nyae* region) was the ecological reason underlying Ju/'hoansi rules of land ownership. In dry periods and drought years, large numbers of Ju/'hoansi (many groups) had to be able to exercise their rights to live at a few permanent waterholes (Marshall & Ritchie, 2003). Rules of land ownership among the Ju//Hoansi were not based on game or "hunting territories", or the territories or migration routes of animals. Large game was hard to find, hunters being happy if they killed and brought home 20-30 large game animals in a lifetime (Marshall & Ritchie, 2003). The right of the *kxa/ho* (the larger land area under which *N!oresi* were subsumed) permitted anyone speaking Ju/'hoansi to traverse this "greater area" in search of water during droughts, while moving from one place to another to hunt, gather and drink water freely, to move freely in search of wounded game, and to gather key bush foods (Hitchcock 2003b). Ju/'hoansi did not make war over territory and resources except against outsiders (e.g., other ethnic groups such as the Herero) (Marshall & Ritchie, 2003). The Ju//Hoansi who lived in these areas, acted as custodians and managers of the resources.

The Basotho chief, Moshoeshoe, led his people onto the *Thaba Bosiu Mesa*, a defensive ground with pasture in the Drakensburg Mountains and with best-watered lowlands for agriculture below. Through his military leadership and cattle as social capital, Chief Moshoshoe forged a Basotho nation, today's Lesotho. Gradually, a land tenure system evolved under the control of local chiefs, which allowed each household to claim three plots to take advantage of microclimates and to allow for crop rotation; mainly sorghum and maize cultivated by women with hoes. Livestock grazed communally (McCann, 1999).

2.3.2 Pasture and Water

Smith (1992) provides an excellent historical overview of pastoralism in Africa. Additional discussions on traditional pastoralism into modern times are presented in Chapter 6, Section 6.1.3, Traditional Pastoralism in Sub-Saharan Africa.

In Northern Ghana, traditionally, grazing areas were open to all, an “Open Access Resource”, both indigenes and migrants, except in crop growing areas. In areas with limited grazing – pasture was limited to the local community and managed as a “Common Property Resource”. Natural water supplies were available to all comers (Tonah, 2002).

“Throughout the Sahel, the traditional migration routes followed by the herds, and the amount of time a herd of given size might spend at a particular well, were governed by rules worked out by tribal chiefs. In this way, over-grazing was avoided. The timing of the movement of animals was carefully calculated to provide feed and water with the least danger from disease and conflict with other tribal groups. The herders made probably the best possible use of the land. The settled part of the population, the farmers, had an equally capable understanding of their environment. They knew to let the land lie fallow for long periods -- up to 20 years -- before re-cropping, and they developed an extraordinary number of varieties of their main staples, millet and sorghum, each adapted to different growing seasons and situations” (Hardin, 1977) (Figure 2.4).

Often farmers arranged, during the dry season for herders to graze on crop residues in their harvested fields as a means of providing organic and nutrient inputs from manure.

“Within the limits of their environment and technology, the peoples of the Sahel have, over the past centuries, demonstrated an impressive record of innovation, which is quite at variance with the common negative criticism of the African as unduly conservative.

In fact, when the Sahelian peoples have been conservative and resisted changes advocated by Western experts, it has often been with reason" (Hardin, 1977).

Along the Inner Delta of the Niger River (Mali), agricultural land, pasture rights and fisheries in floodplains and fields of drylands were allocated as "common property" ("*res communes*"). The hereditary position of the "master of the land" (*chef de terre*) was responsible for management and allocation of terrestrial resources. He reported to the council of elders. Migration to and from the Delta between dry (to) and wet (from) seasons was one of the key management strategies (mobility) adopted by the rural communities to use different resources at different seasons and also to cope with climatic risk (Moorehead, 1994). Corridors between wet (interior away from floodplains) and dry season (floodplains) grazing areas were controlled and managed by various clans. Transhumance pastoralists moving through the area would request permission to graze their livestock, the time allotted to them depending on the size of their herds and the quality of that year's pasturage. On the falling floods in January, sorghum was/is planted along with cassava and groundnuts. Rice was/is planted with the rising floods of July/August and harvested as the floods receded/recede between December and February (Madeley, 2002). Bremaud (1955 *In:* Smith, 1992) outlines six stages in the normal annual transhumant cycle of pastoralists in the West African Sahel:

- **Phase 1:** First rains – the herds leave permanent water-holes/floodplains for temporary water sources.
- **Phase 2:** With the rainy season well underway – plenty of water and green pasturage – there is a movement towards *terres salées* (natural salt licks)²¹ or abundant pastures;

²¹ It was at these natural salt licks where transhumant orbits overlapped that related Sahelian Tuareg groups had their annual rendezvous for the purpose of social bonding from marriage to politics (Smith, 1992).

- **Phase 3:** Near the end of the rainy season there is a return from the *terres sallées*, using pastures available through temporary water sources (*mares*). The exhaustion of small surface water supplies (*mares*) occurs with the development of the dry season, while wild grain is harvested and grain is also obtained through exchange with sedentary peoples;
- **Phase 4:** Utilization of the same pasture by sinking wells takes place if sufficient rains have fallen to form an underground aquifer;
- **Phase 5:** Gradual movement towards permanent water sources takes place; and
- **Phase 6:** Concentration around permanent water sources during the dry season (e.g., floodplains).

Movements of pastoralists were cyclical rather than random. Scouting parties were even sent out by many pastoralist groups to determine where the best pasture was to be found and to determine the most opportune time to move the livestock. As discussed in Chapter 1, pastoralists were opportunistic, their dietary regime including bushmeat, fish, shellfish along the coast, wild grain and, in good rainfall, years cultivated grain. Prior to colonialism, certain war-like groups such as the Tuareg extracted grains from agriculturists in return for guaranteeing protection against other marauding nomadic groups (Smith, 1992) (see Chapter 6, Section 6.1.4.6, Impacts on pastoralism and range ecology from sedentarization and privatization policies).

In the Sahel, movement tends to be north south; north during the rainy season from June/July to September/October and then south during the dry season as the tsetse fly belt contracts. Traditionally in the Sahel and elsewhere pastoralists, in addition to herding, harvested wild grains, hunted and fished as the need and opportunity presented itself. Wild grains consumed include but were/are not limited to *Cenchrus biflorus* and *Panicum laetum* (Smith, 1992).

The Khoi of South Africa's Cape region, also known as the Khoikhoi, Khoisan and Hottentot, practiced transhumance, moving their animals constantly to avoid disease from trace element deficiencies (e.g., *lamsiekte* from seasonal phosphate deficiency in cattle, causing them to eat dried bones of carcasses and consequently dieing from botulism). They also moved seasonally, depending on the availability of pasture. For instance in the summer (dry season) when the pasture was scarce, the Khoi abandoned the Vredenberg Peninsula and moved inland towards the permanent waters of the Berg River. They had little competition from the Bantu, who provided them with their sheep and cattle, as this was a winter rainfall area and at the time, the Bantu had only summer rainfall crops. It would not be until the displacement of the Khoi by Dutch settlers in the mid-1600s, resulting in fencing, private land ownership and year round grazing that habitat degradation would become a major issue (Smith, 1992) (see Chapter 6, Section 6.1.4.2, Compression from expropriation of land for both European settlers and the creation of parks and protected areas).

Among the Maasai, pasture traditionally tended to be an “Open Access Resource” available to other Maasai clans, but not to other ethnic groups. This, along with local control over access to pasturage, water, etc. by extended families, was a way of assuring the sustainable management of their resources. Specific pasture (*alalili*) was set aside near permanent living areas for the grazing of calves and “weak” cattle. This was managed on a rotational basis (Mbarnoti, 2003). Most mobile pastoral groups established well-defined range reserves within their annual grazing area to provide a “savings bank” of forage. Most reserves were/are communal, such as drought reserves (e.g., Odell, 1982 *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000) and sacred sites (Schlee, 1987 *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000), but some were/are also private, such as the immediate surroundings of Maasai camps (Ole Kuney & Lendiy, 1994 *In:* Niamir-Fuller,

2000 *In: McCarthy, et al., 2000*). These reserves performed/perform the dual functions of reducing risk and maintaining ecosystem resilience (Niamir-Fuller, 2000 *In: McCarthy, et al., 2000*).

Among the Ndonobo hunters, an offshoot of the Maasai but considered a lower caste, they could only own non-milk producing cattle (Smith, 1992). Similarly, in Uganda, the Iru could only own barren cattle, breeding stock being reserved for the dominant Tutsi/Bahima (Mair, 1977). In some respects, this could have helped control grazing pressure, through controlling herd size, with the largest herds and the majority of pasture being reserved for the “political” elite.

The Gabbra are “a group of 35,000 pastoral people living in an area measuring 40,000 km² of north-central Kenya. Rainfall in the Gabbra area increases as the elevation changes, with average annual rainfall ranging from 150 mm in the Chalbi Desert to nearly 1,000 mm in the Marsabit and Kulal highlands” (Stiles, 1992 *In: Swallow & Kamara In: McCarthy, et al., 2000*). “The Ngisonyoka Turkana—10,000 people living in an area of about 10,000 km² in northeastern Kenya. Mean annual rainfall across the area is about 220 mm/year” (McCabe, 1990 *In: Swallow & Kamara In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

“The areas occupied by either group are not cultivated, although some of boundary of the area occupied by the Gabbra is cultivated.

The Ngisonyoka Turkana and the Gabbra defend the boundaries of their territories with military force. Drought conditions result in greater conflict as the groups residing in the area try to spread over more land, while at the same time, neighboring groups increasingly do the same. In normal years, the Ngisonyoka Turkana only use about 75% of their territory to avoid the risk of violent conflict and banditry from the neighboring Pokot and Karamojong groups. However, in drought years, they run the risks and rely quite heavily on the contested areas.

The Gabbra maintain particularly strong and centralized sociopolitical-religious institutions that support the common-

property regime. Wells belong to the clan or group that dug them and are managed by a ‘father of the well.’ Elected leaders, called *hayu*, act as judges. Their appointees, *jallabu*, serve as mediators. The Ngisonyoka Turkana have a more decentralized form of governance. Wells are owned by individual families and councils of elders resolve disputes (Swallow & Kamara *In: McCarthy, et al.*, 2000).

McCabe (1990 *In: Swallow & Kamara In: McCarthy, et al.*, 2000) and Stiles (1992 *In: Swallow & Kamara In: McCarthy, et al.*, 2000) argue that these systems continue functioning smoothly despite changes in national policies toward property rights, in environmental conditions, in technology, and in the activities of donor and international agencies. National policies on property rights that had so much impact in Maasailand have had little impact on the Turkana and Gabbra. However, technical and social changes initiated and promoted by nongovernmental organizations and development-assistance agencies have had a greater impact. The construction of modern wells has threatened the social bases of resource-management regimes. The availability of modern weaponry has escalated intergroup conflicts. Education has reduced the availability of labor, and the Christian religion has reduced the social bases of the property-rights regime. Population growth has not been a major driving force. On the contrary, out-migration and children’s going to school are reducing the labor available for herding. This is critical, since the systems of herd splitting and hand elevation of water from deep wells (Swallow & Kamara *In: McCarthy, et al.*, 2000)...results in the highest level of work recorded for any society in the world (Stiles, 1992 *In: Swallow & Kamara In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute)”.

The Borana Plateau of southern Ethiopia “occupies an area of about 95,000 km² in the southern part of the Ethiopian lowlands. The population of about 600,000 people is widely distributed across the plateau, with an estimated density of six people/km²” (Cop pock, 1994 *In: Swallow & Kamara In: McCarthy, et al.*, 2000).

"The area is semi-arid, with an average annual rainfall that fluctuates between 499 and 869 mm/year. Extensive livestock-production is the dominant land use....Grazing resources on the Borana Plateau (pasture and water) are to a large extent owned communally and administered by traditional elders who formulate rules governing resource use, enforce these rules, and ensure that sanctions and penalties are implemented. The social organization of the Borana pastoral system is generally based on the *gada* system which divides the Borana community into a number of age groups...The entire Borana plateau is divided into traditional administrative units called *maddas*. Each *madda* is constructed around a permanent water source (traditional deep well or permanent pond) that is administered by a 'father of the well.' The wells are of vital importance to Borana pastoralism, and all economic and social life revolves around the wells. There are nine groups of such wells in 35 locations around the central part of the plateau (Helland 1982 In: Swallow & Kamara In: McCarthy, et al., 2000). The 'father of a well' regulates its use, oversees its maintenance, and coordinates with *madda* elders on the implementation of rules, regulations, and sanctions regarding the water source. Each *madda* is subdivided into *ardas*, and each *arda* is further subdivided into a number of encampments, or *ollas*. Each *arda* has jurisdiction over some form of grazing area, cultivation land, and to a lesser extent, water resources. The *ollas* consist of at least ten households and are the smallest administrative units in the system. At the *madda*, *arda*, and *olla* levels, officials (usually elders) manage the affairs of their respective communities. At the *madda* level, decisions are made regarding which areas are left open as pasture (unsettled), which are open to settlements, and which can be brought under cultivation. Pastures can either be *fora*, *warra*, or calf enclosures. *Fora* grazing areas are available to bulls and nonlactating cows (dry herds), and are open to all Borana people. *Fora* areas also include transit areas around permanent water points. Permanent settlement is prohibited in *fora* areas. Such areas are regarded as fall-back areas 'for all' during periods of forage scarcity. Otherwise, there are few restrictions on the use of *fora* areas. Their management approximates open access. *Warra* areas are grazing areas for lactating cows and sick and weak animals. Those animals are returned to the encampment every day so that they can be milked and monitored. Areas within an *arda* designated as *warra* are open to members of the *arda* and to members of different *arda* under special arrangements. *Warra* areas are not fenced and exhibit somewhat fuzzy boundaries. Membership to a *warra* area is open to all *arda* members and is

usually very large. Grazing time is not restricted except during periods of forage scarcity, when herd-splitting agreements force dry herds to migrate...Calf enclosures are thorn-fenced fodder-banks for calves and, to a lesser extent, milking cows. Calf enclosures are only used in the dry season and only by members of a particular *arda* or *olla*. Calf enclosures have clearly defined boundaries demarcated by thorn fences. (Swallow & Kamara In: McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute”).

Among the Tswana of Botswana, until the 19th century, all cattle were the property of the chief, who allocated cattle at the level of the household for herding and milk. The *Modisa* (*Badisa* – plural) allocated grazing land and access to surface water and also controlled grazing pressure as a means of managing the rangelands from over-use (Cullis & Watson, 2005). Similarly, among the Tswana cattle-herding people of Southern Africa, a lineage group controlled both grazing and water rights. Non-lineage herders passing through the area had the right to water their cattle, but required permission to remain for long periods (Ward, 2002).

Among the Hambukushu of the Okavango Delta, there were no restrictions on how many beasts a person could rear. There were no boundaries between people with regards to grazing pastures. Anybody could graze their cattle anywhere. Different herds intermingled, with herd boys to sort them out. Grazing pressure was controlled at the village level as a “Common Property Resource”. A village could be made up of a number of different lineages, but of the same Hambukushu ethnic group. Owners of the herds, from a given village, in essence developed a pasture management plan, determining where and for how long they would graze their cattle in order to avoid over-grazing and degradation of the habitat. Where possible, reserve pasture remained ungrazed as insurance against a drought. In case of a drought and crop failure, this reserve pasture assured that enough cattle

would survive both as a source of food to avoid starvation and as a nucleus from which to build up the herd during good years (Mangurunga, 2003).

Among the Uukwaluudhi (Owambo Group) of Namibia, community members could let their cattle graze freely on communal grounds, but outsiders needed the permission of the king (Hinz, 2003).

2.3.3 Fallow Agriculture in Low Productive Areas

Over large areas of Africa, low-input agriculture with long fallow periods was and is practiced as a way of managing soils to maintain long-term fertility. Along the floodplains of the Logone River of Chad, ashes from burned floodplain vegetation were/are used as a fertilizer on the higher ridges where crops were/are planted. Once *taro* (coco yams) was/is harvested, a field was allowed to lay fallow for three years. The fallow fields provided/provide grazing for goats from the village and the cattle of nomadic pastoralists. In times of flood, the regenerating vegetation served/serves as a breeding area for fish. In the second and third years following the *taro* harvest, a tall herb, *Sesbania* sp.,²² emerges. Its wood-like stem served/serves as the main fuel resource in the village and was/is also important in the construction of fish traps and cages. Diking was/is used to trap water in rainfed rice fields. Higher up millet was/is cultivated (Dadnadji & van Wetten, 1993). In the Luangwa Valley of Zambia, the Bisa practiced shifting cultivation with long fallow periods (Marks, 1984):

- Ten years of cultivation took place before abandonment on alluvial soil along the river (Floodplains)

²² Also appears to be a nitrogen fixing legume increasing soil fertility (see Chapter 5, Section 5.12.1.1, Integrated nutrient management (INM), Integrated Nutrient Management (INM)/Low External Input (LEI) Agriculture in East and Southern Africa.

- Six years of cultivation took place before abandonment on mopane soils
(Rainfed)

The Upper Guinea forest of Central Ghana was protein rich in bushmeat and fish, but poor in carbohydrates. A 15 year fallow was developed so that each hectare plot would be in production for three out of every 18 years; taking 6 ha to support a family of five. For each hectare of virgin forest that was cleared, 1,250 tons of moist vegetation had to be removed. Fifteen years later, after fallow this required the removal of only 100 tons of vegetation. Expansion of the human population was believed to have taken off around 1500 AD, with the arrival of New World forest foods including cassava, coco-yam, peas and maize brought in by Portuguese ships. This sparked an agricultural carbohydrate revolution, allowing the forests to support an empire. Maize allowed two harvests and cassava could tolerate poor soils, drought and neglect. Plantain (cooking bananas) arrived from Asia at about the same time (see Chapter 1, Section, 1.1.3, Evolution of Modern Agriculture in Africa). Inter-cropping and minimum till agriculture were practiced with maize and cassava grown around mounded yams. Maize could be grown for three years followed by 15 years of fallow. Cassava and coco yams remained in the ground to suppress weed growth and protect soils. Cassava could be left in the ground for two-three years, providing food during the fallow periods. Small pioneer forest species were preserved and helped recycle nutrients. Eight species of trees and nine species of shrubs and herbs were known by farmers to have soil enhancing qualities. Under such a fallow system, Central Ghana could have supported 500,000 people or 130 people/km², a density attributed to the Ashante Empire in the early 19th century (McCann, 1999) [see Chapter 1, Section 1.4.8.1, Ashanti (Asante) Kingdom, modern day Ghana; Chapter 3, Section 3.1, COLONIAL STATE IN AFRICA; Chapter 5, Section 5.9.4.4, Population, commercial maize and forest loss in Ghana, 1908-1996; and

Chapter 12, Section 12.4.4.2, Impacts of structural adjustment on Central Ghana cash crop economies, fallow and virgin forests].

In the humid dense lowland forest areas of Southern Cameroon, fallow length in the mid 1980s was probably between five to ten years, farmers generally planting each field one to two years before letting it return to fallow. For every ha of food crops in shifting cultivation systems in Southern Cameroon there were 5-10 ha of fallow of less than ten years old (Ndoye & Kaimowitz, 1998)

In the Ivory Coast, fallow agriculture was used when a plot began to have poor yields or to be invaded by weeds. Letting land lie fallow also helped to control the invasion of certain crop pests and diseases. Fallow agriculture took space, depending on the number of years of production versus fallow, but it was not destructive (Ibo, 1994).

In and around the homes, women operated “*green manure*” gardens (*sunture or tapades*) to overcome the thin, poor, lateritic soils of the Fouta Djallon Mountains of Guinea-Conakry, which when they lost their organic cover became acidic resulting in the leaching of nutrients and heavy metal (aluminum and iron) toxicities. They were kept fertile by livestock manure and mulching. They cultivated maize, coco yams (*taro*), sweet potatoes, yams, manioc and fruit trees (e.g. mango, papaya, oranges and bananas) in these gardens. Maize was usually intercropped with root crops. The yields from the *tapades* were more important for household provisioning than food from other fields. Outside of the *tapade* in “open areas”, large fields with *fonio* (*Digitaria exilis*), rice, groundnuts (peanut, *arachide*), millet and sorghum were cultivated mainly by the men. This was undertaken under shifting cultivation, with long-fallow periods of up to 20 years (University of Michigan, 1985).

Among the Mpiemu of the Sangha Basin of French Equatorial Africa/*Afrique Équatoriale Francaise* (AEF), men cleared the fields, while women cultivated small one ha plots for two to three years, sometimes cultivating both rainy seasons (February-June and July-October). Fields were traditionally cultivated for two to three years and then fallowed for seven to eight years. Introduced maize (*mpusa*), possibly obtained from Hausa traders, was intercropped with cassava, yams, banana trees, peanuts, sesame, sweet potatoes, sugar cane, assorted edible greens and squashes. As people who were integrally linked to the forest and its resources, but who also farmed, the Mpiemu believed that they originated as offspring of forest and fallow deities (*Ntchambe Mekwombo*, the deity who created and commanded the forest and its people, and *Ntchambe*, the deity who taught people to cultivate land) (Giles-Vernick, 2002). According to Biko'o and Nkombe (*pers. comm.*), the Mpiemu have only one God, *Ntchambe* (see Section 2.1.6, Hunting Guilds as a Means of Controlling Access to Wildlife).

Long-fallow periods followed 3-4 successive years of growing maize, rice, sorghum and cassava, inter-grown with legumes (Fuggles-Couchman, 1937 *In: Kjekshus*, 1977) in the coastal areas of Tanzania. The fallow allowed the bush to return to what was called “Mashokora Thicket”. Fallow was for a minimum of 20 years. It is estimated that this form of cultivation could sustainably support a human population density of 15/km². Similar cultivation practices have been recorded for the Makonde/Makua people on the northern side of the Ruvuma River (Livingston, 1874 *In: Kjekshus*, 1977). Bornhardt (1900 *In: Kjekshus*, 1977) believed that at least 10 ha of forest (thicket) land would be destroyed for every one ha under cultivation. Permanent settlement, traditionally only occurred along “alluvial floodplains” such as the Ruvuma, where rice was cultivated (Livingstone 1874, I: 29 *In: Kjekshus*, 1977). These areas were “densely populated” compared to the compared to the neighboring hills and plateaus (Adams, 1902 *In: Kjekshus*, 1977).

2.3.4 Agriculture in High Productive Areas

2.3.4.1 Aksum of Ethiopia

Atop the Shire plateau, of what is now the Eritrea and the Tigray region of Ethiopia, the Aksum's empire (first to the fourth centuries AD, see Chapter 1, Section 1.5.2, Aksum) diverse ecological niche's based upon elevation, rainfall and soil types allowed farmer's to select and develop cereal and oil seed crops from local grasses including finger millet (*Eleusine coracana*), niger seed (*Guizotica abyssinica*) and teff (*Eragrostis tef*). They also adopted Near Eastern staple grains such as wheat, barley and sorghums from the Nile Valley and elsewhere in Africa. In all, there are 24 grains and oil seeds for which Aksum was a world center. Both long and short-maturing crops allowed farmers to take advantage of local climatic conditions. They were masters of water management, 75% of the rain falling from July-September, and developed an elaborate system of water harvesting, storing water in ponds and cisterns. Irrigation, terracing and soil drainage systems helped maximize crop yields. Theirs was also the only Sub-Saharan farming system to develop an ox plow before the 19th century, significantly increasing farm labor efficiency. This allowed for the accumulation of surplus grains, and the development of urban centers and armies, as well as expansion of frontiers to the north, south and west, resulting in greater access to ivory, slaves, incense, gold, etc. (McCann, 1999).

2.3.4.2 Traditional irrigated agriculture

Knowledge of irrigation appeared throughout the highlands of Tanzania (Kjekshus, 1977), the Great Lakes Highlands (Chrétien, 2003) and Kenya. By the beginning of the 20th century, some of these areas were already over-populated and experiencing soil degradation:

The Usambaras Mountains, Tanzania

Irrigation systems of great complexity had removed the risk of drought. The Wasambaa were described as excellent water technicians and irrigation that was several miles long was not uncommon (Warburg, 1984:134 *In: Kjekshus, 1977*). Terracing was also practiced. The cultivation circuit had been overextended by the 1890s (Kjekshus, 1977).

The Kilimanjaro and Upare Mountains, Tanzania

All male Chagga were educated in the creation of irrigation systems (Krapf, 1860 *In: Kjekshus, 1977*) linked to the long and short rainy seasons, assuring them a third cropping season and thus protecting them against the dry season and droughts (Volkens, 1897 *In: Kjekshus, 1977*). By the late 1890s, the mountains were already densely populated and most land was under cultivation with little opportunity for European settlement. The situation had the potential to result in conflict (Brehme, 1984; Widenmann, 1895 both *In: Kjekshus, 1977*). The human density of pre-colonial Chaggaland was $154/\text{km}^2$ ($400/\text{mi}^2$)²³ (Allan, 1965 *In: Kjekshus, 1977*). The Pare agriculture in these steep mountains was characterized by terracing and irrigation (Baumann, 1891 *In: Kjekshus, 1977*) with bananas as the staple crop.

²³ Compares with Rwanda in 1994 with 290 inhabitants/km², and 843 inhabitants/km² of arable land (11,250 km² or 43% of the territory) (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests, Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Fuelwood, Spawning Political Destabilization).

The Usagaras, Tanzania

Dry season irrigation schemes existed from the southern Usagaras Mountains into the heavily populated valleys of Mwega, Rumuma and Munaga (Tiller, 1913 *In: Kjekshus*, 1977). Dams of stone and timber high in the valleys fed irrigation furrows. They grew sorghum, maize, sweet potatoes, beans, groundnuts, sesame seeds, sugar cane and less frequently rice, bananas, cassava and cucumbers. Crop production was for local consumption, but part was also sold to the caravan running between Kilosa and Iringa. Tobacco was also of commercial importance.

The Great Lakes Highlands

Observations in the last century and linguistics point to the knowledge of hydraulic systems in the mountains, including man-made watering places, river diversions, hollowed-out tree trunk pipes, irrigation on cultivated slopes, mounding in drained marshes and irrigation of banana and palm tree gardens on the plains of Lake Tanganyika. These forms of intensification favored sedentarization and the success of agriculture accounts for the high human densities experienced today (Chrétien, 2003).

2.3.4.3 Knowledge of soil fertility techniques in high productive areas

Integrated Nutrient Management (INM) was being practiced before colonialization. Cattle and green manuring was practiced, along with terracing in the mountainous areas (Chrétien, 2003).

Kikuyu Highlands, Kenya

The Kikuyu farmers of Kenya developed a system of rotating their crops and preserving the soil, while planting a number of different crops together so timed that one crop protected another (Leakey 1954, *In:* Hunter & Mannix, 1954).

Southwestern Uganda

“In Kigezi, there were relatively well-developed indigenous soil conservation practices, involving fields along the contour, brash lines, cultivation of legumes and simple terrace formation: as Carswell remarks, ‘at the time of the arrival of the British the Bakiga agricultural system was highly adapted, suited to local conditions and sustainable’, In place of the resistance to state-imposed soil conservation programs familiar elsewhere in East Africa, there was a considerable measure of agreement between the strictures of the District Agricultural Officers (DAO) and local practice” (Adams & Infield, 1998).

Carswell (2003 *In:* Beinart & McGregor, 2003) confirms this statement.

In the Usagaras, Tanzania

The peasants were familiar with the use of animal dung as fertilizer. Grain was always planted with nitrogen fixing legumes. Up to three crops were planted simultaneously in the irrigated fields (Tiller, 1913 *In:* Kjekshus, 1977).

Ukonde/Unyakyusa, Tanzania

In the southern Tanganyika Highlands, the Nyakyusa people adapted to the sharp changes in altitude and rainfall in their selection of crops, rotation, ridging, the use of nitrogen fixing legumes, and manure for household plots from stalled cattle to protect them from thievery (Thwaites, 1943 *In:* Kjekshus, 1977). The banana

culture of the Konde used green manure, ashes, mulching and animal dung as fertilizer in the banana fields and garden plots where three successive crops of maize, beans and sweet potato were harvested/year. As in Kilimanjaro, population pressures transformed the available grasslands to fields cultivated for staples and fodder. The critical population density of the region was believed to be 77 people/km² (200 people/mi.²) (Allan, 1965 *In:* Kjekshus, 1977).

Umatengo, Tanzania

The steep Matengo Highlands agriculture was characterized by anti-erosion techniques and green manuring and ridges (Pike, 1938; Stenhouse, 1944 *In:* Kjekshus, 1977). Cultivation was in permanent fields, with fertility built up by a box-pit method, which exposes the subsoil while green manure is building up the humus and deepening the layer of fertile soil. This was a labor-intensive agriculture, which young people abandoned for easier work under the German colonial system. Irrigation was common (DFB, 1898 *In:* Kjekshus, 1977). Once again, this system was developed under heavy population pressure, the chief's village alone having 5,000 people (Buss, 1902 *In:* Kjekshus, 1977). Maize, peas, tobacco and cotton were grown (Kjekshus, 1977).

Ufipa, Tanzania

This group practiced a system of mound cultivation to maintain soil fertility and lengthening the cropping period. Beans were grown on the green manure mounds in the first year to aid in fixing nitrogen. Green manure was allowed to rot a year before the mounds were broken down and spread over the fields. Cropping alternated between flat cultivation and mounds/ridges with alternating crops. In the miombo woodlands, they practiced "slash and burn" agriculture and fallow

periods. In plots next to the villages where tobacco was planted, urine from goats and sheep was used as a form of “animal manure” (Kjekshus, 1977).

2.3.5 Dispute Resolution over Natural Resources

Among the southern Bantu-speaking people, if someone’s cattle trampled a neighbor’s crops, the neighbor would report the matter to a sub-headman and a date was set for the hearing. The accused was asked to attend, along with witnesses. Courts were held on an as needed basis. The case was heard in the men’s meeting place, which was a prominent feature of the homestead of the chief or headman. The judge, with his assessors and close relatives, sat facing the male members of the ward. Courts were not separate from the decision-making bodies that assisted chiefs and headmen in running their wards and chiefdoms. There was no separation between the administration and the judiciary. The major goal was reconciliation, with the goal of the guilty admitting wrong and he who was in the right to forgive (Hammond-Tooke, 1993).

2.4 TRADITIONAL FORESTRY MANAGEMENT

Traditionally, there was little need to intensively manage Africa’s forests. Associated with fallow agriculture, secondary forests provided a source of firewood, medicine, and food.

In the Inland Delta of the Niger River, forest, browse and wild food resources were “open access” property (*res nullius*) (Moorehead, 1994).

However, over much of Africa, some controls were placed in the management and access to “sacred forests”, which had special religious significance to rural small-scale societies. These forests were managed as “Common Property Resources”.

One example is the sacred forest grove of the Malshegu community located in the northern administration Region of Ghana. This forest was the home of the fetish god who helped families and protected them from the invaders. All forms of farming and grazing in the sacred grove and the fetish lands were prohibited. Entrance into the grove and fetish lands was only permitted during biannual rituals honoring the Kpalevorgu god or on other special occasions with advance consent of the “*Kpalna*” (fetish priest) and other village leaders. During these occasions, some hunting and collecting of various species of rodents and birds took place; the catch was closely supervised and controlled by the *Kpalna* and village leaders. This temporary lifting of the hunting ban did not extend to reptiles believed to be harmless, the African python being considered the sacred symbol (or representative) of the Kpalevorgu god. It was nearly impossible for anybody to enter the grove without being detected, approached, and reported to local authorities. In the past, offenders were lynched. The buffer fetish lands around the sacred grove are encircled by a 1/4-1/2 km wide band of land on which only grazing is permitted. This buffer also serves as a fire belt to protect the sacred grove from annual dry-season bushfires (McCann, 1999).

2.5 CONCLUSIONS

In pre-colonial Africa, human populations were low relative to the resource base. Wildlife, forestry, fishery, pasture and agricultural lands were extensively managed. Due to the high ratio of resources to people, it was unnecessary to practice intensive management. Most resources tended to be linked to a territory owned by the ancestors, access to which was ultimately in the hands of the king/chief and his headmen who were elders within the community. Most resources were managed as common property for the good of the community, although there was some commercial use. Over a large part of Africa, hunting was considered a profession, requiring innate skills and acceptance by elders into

a guild where a three to six year apprenticeship was undertaken. The apprentice would spend most of his life under a “master hunter” until he became a “master”, who provided him with direction, and taught him in the secrets of the hunt linked to the ancestors and spirit world. Without such knowledge, one’s life and that of one’s family would be in great danger. Thus limited access to these guilds helped control hunting pressures, assuring sustainable use of wildlife for the greater good of the community. In most cases, individuals within the lineages were given responsibility for the management of aquatic (fisheries – *chef de marigot/chef de pêche*) and terrestrial (agricultural lands, pasture – *chef de terre/chef de chasse*) resources for the good of the community. Non-lineage migrants had to request permission within a given lineage’s territory to access its resources. Inter-cropping, manuring and fallow were used to maintain agricultural production. In many high yielding areas where irrigation was practiced, over-population was experienced, even in pre-colonial times.

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Chapter 3

3.0 COLONIALISM AND THE IMPOSITION OF WESTERN WILDLIFE MANAGEMENT SYSTEMS

“Two aspects to consider: Civilize the people and colonize the land. Civilize the people? I would very much like to. But what an enterprise! To meld France to Africa is not only to bring together and mix two peoples...it is to bring together centuries. On the one hand, we of the 19th century, with a free press and full civilization, and on the other, the pastoral and patriarchal, the century of Homer and the Bible. Can these two peoples resemble one another, except before God? Can they mix in any way but in the tomb, when one soul resembles another, where dust resembles dust? In life they reject and exclude one another and one hunts the other. Therefore, colonize the land”, (Victor Hugo *In: Rosenblum & Williamson, 1990*).

“It is significant that pre-colonial conservation, based as it was on the unity of humanity and nature, did not create separate categories for conservation, but rather devised strategies for conserving nature while at the same time guaranteeing access to it. Although this access and use may have been mitigated by policy, religion, custom and practice to reflect existing stratification and other imbalances in pre-colonial society, the motivation for conservation was to guarantee human access to nature. This was in direct contrast with the colonial model of conservation, which has led to the development of nature conservation areas as areas cleared of all human influence and settlement (e.g., parks, game reserves and hunting blocks), with highly restricted access to resources” (Murombedzi, 2003a).

3.1 COLONIAL STATE IN AFRICA

“The barbarisms and the atrocities perpetuated by so-called Christians in every area of the world and on all the people they have been able to subjugate have no parallel in any other era of

world history, in any other race, however savage, coarse, pitiless or shameless it may have been" (Howlitt, 1838 *In:* Dumont, 1966).

"The colonization of Africa, Australia, Asia, the Arctic, the New World, and the Pacific by various European nations from the 15th to the 19th centuries saw the expansion of contacts between indigenous peoples and non-indigenous governments and agencies" (Hitchcock, 2003a).

The colonial history of Sub-Saharan Africa has many parallels with that of Latin America (Burns, 1984) and North America. Wildlife would become a point of contact between African people and European ideas. Whites would introduce both a strong market economy and firearms that tipped the scales towards over-exploitation (Carruthers, 1995). Colonialism expropriated the landscape and alienated Africans from it (Maddox, 2002 *In:* Dovers, Edgecombe & Guest, 2002). Colonialism excluded African beliefs in the intrinsic power and value of nature in favor of the Christian tenets of taming and civilizing nature (Carruthers, 1995).

"Indigenous peoples were subjected to policies that ranged from outright genocide to paternalism and benign neglect. Some groups chose to accept their situations; others resisted what they saw as an onslaught; and still others took advantage of new opportunities" (Hitchcock, 2003a).

The "division of Africa into its present countries was the product of Western interests not African minds. The lines drawn on a map by the great European powers in Berlin in 1884 still have profoundly disruptive consequences. Many traditional communities of people are now divided between two, three or even four countries. Elsewhere disparate groups, some of whom were traditional enemies, are yoked together in uneasy union, many of them lacking a common language with which to speak to one another. Colonialism favored some groups over others, creating new hierarchies...many modern African states lack any natural geographic, ethnic, political or economic coherence...The new systems were more often than not designed with a colonial wish in

mind to ‘divide and rule’ local communities. This created both artificial divisions and new hierarchies within groups and sowed seeds for conflicts after the colonial leaders departed” (Commission for Africa, 2005).

3.1.1 Colonial Autocracies

The colonial state was autocratic, not democratic (Martin & O’Meara, 1995; Leistner, 2004).

3.1.2 Loss of Land to European Settlers, East and Southern Africa

The British imperial enterprise in much of East and Southern Africa, more than any other, depended on “settler” labor – English, Welsh, Scottish and Irish. Reliance on settlers resulted in wholesale territorial engrossment. As in North America, Australia and South Africa, settlement advanced by occupying all the land (Lowenthal, 1997 *In:* Griffiths & Robin, 1997). Many of the problems that exist today (2005) in Southern Africa can be linked to a minority white group expropriating land from the majority, while compressing them into marginal, less productive areas. This will be discussed further in Chapter 5.

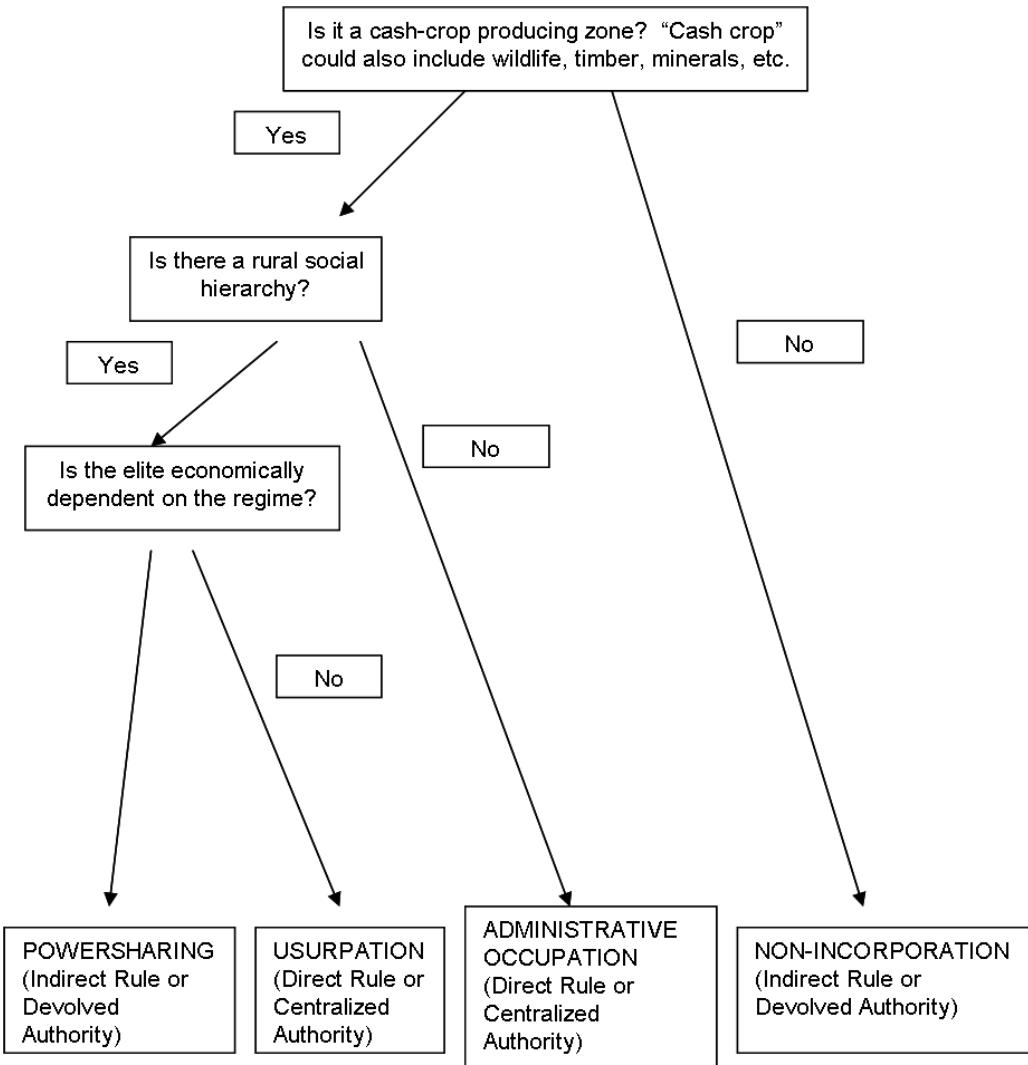
3.1.3 Creation of a Westernized Urban Elite

Very often, political and civil rights were accorded to an elite group of Westernized Africans, often of mixed-European/African blood such as the *métis* in Senegal (July, 1970; Martin & O’Meara, 1995) or *mesticos* in Portuguese Africa. The small minority of educated Africans was seen as fitting into low-level bureaucratic functions within the colonial administration that was run and operated by Europeans (Martin & O’Meara, 1995). René Dumont (1966) equates the creation by colonial powers of this “tiny administrative African elite” and

their secluded privileged existence isolated from the mass of poverty stricken peasants as a form of *Apartheid*. As will be seen throughout this document, this relationship of a minority political elite continues into the 21st century, often bolstered by government to government foreign aid (see Chapter 11) that has little or nothing to do with economic development, if anything impeding its evolution through creating welfare states and mentalities.

3.1.4 Relationships between the Rural Elite and Colonial/Post-Colonial Administrations

Boone (2003) demonstrates the relationship between the rural elite and both colonial- and post-colonial administrations as varying between direct and indirect rule, often within the same country depending on the strength of traditional rulers and the potential wealth of the area as a tax base (Figure 3.1). “Local” or “traditional” governments may or may have not been participatory and democratic, deriving power from hereditary (e.g., kings, chiefs) or spiritual (*marabouts*) authority or land tenure relations. Leistner (2004) argues that while traditional chiefs were raised in an environment where they were responsible for and held accountable for their subjects, most of the new political elites did not emanate from the traditional ruling class and thus lacked this sense of responsibility. Ayittey (1989 *In:* Leistner, 2004) observes that some of the so-called traditional “*backward and illiterate chiefs showed a far greater sense of intellectual maturity than many of the modern and educated African heads of state*”.



Source: Extracted from Boone (2003) with permission, Cambridge University Press.

Figure 3.1: Determinants of institutional arrangements between rural societies and colonial/post-colonial governments

3.1.4.1 Francophone colonial Africa

Following the French philosopher Descartes, the colonial power took the approach that “we can render ourselves the master and possessor of nature”, radiating civilization in the heart of darkness. With Saint Louis, Senegal as the

starting off point, the French established themselves along the coast and eventually the interior of West Africa, establishing massive irrigation schemes along the Niger River, clearing forests for plantation agriculture, destroying traditional production systems in favor of forced labor to produce cash crops, shooting out game for sport in favor of replacing it with livestock (Rosenblum & Williamson, 1987). This basic version of colonialization would repeat itself across the continent with the Germans, British, Belgians, Portuguese and Italians. Whoever and wherever the colonial powers ventured, European visions of landscape, nature, technologies and culture were imposed on Africa as though it had no past with the only future being one of Western civilization. North, Central and South American civilizations would suffer similar fates with the coming of the Spanish *conquistadores* and eventually French and English traders, fur trappers and settlers (see Section, 3.12 COMPARISON WITH EUROPEAN COLONIZATION OF NORTH AMERICA).

Though “direct rule” was France’s official position on how to administer the colonies, on the ground it was obliged to be pragmatic (Boone, 2003). “The French ideal of ‘assimilation’ of the colonized, which became the guiding principle for most Sahelian countries, was predominated by centralism and the submission of local leaders to the power of Paris” (Kirk, 2000 *In: McCarthy, Swallow, Kirk & Hazell, 2000*).

West Africa

In West Africa, July (1970) describes French rule as quasi-military with rigid authority imposed by the French military. France practiced the policy of *regroupement* that “first emptied this colony of its distinguishing features and then remapped it as a European space and imposed modern territoriality through the creation of permanent roads and fixed villages” (Giles-Vernick, 2002). Boone

(2003) describes similar “scorched earth” militaristic *regroupement* into “strategic villages” along roads cut through the forests, resulting in the loss of control over traditional lands in southern Ivory Coast (*Cote d’Ivoire*). Traditional social structures were destroyed. Loyal agents “chiefs”, often of another ethnic groups and sometimes from another country (e.g., Senegal) were appointed to control these villages, collect taxes, produce forced labor, etc. (Boone, 2003; Vandeweghe, 2004). This would be considered a form of direct rule through usurpation. Where these structures did not exist, they were created (Martin & O’Meara, 1995). It can also be argued that the failure to achieve true devolution in Community Based Natural Resources Management (CBNRM) in modern times is due to the continued erosion of rural authority and to the value of wildlife, resulting in the state and politically connected middlemen (both national and expatriate) usurping control and being reluctant to give up direct control over income from this resource [See Chapter 9, COMMUNITY BASED NATURAL RESOURCES MANAGEMENT, (CBNRM) PROGRAMS - THE WAY FORWARD?].

Central Africa

Similarly, during the first years of the 20th century, French colonial administrators collected taxes from Central African chiefs, primarily in the form of ivory and rubber. Chiefs were threatened with imprisonment if they failed to pay taxes or to meet worker quotas. In French Equatorial Africa/*Afrique Équatoriale Francaise* (AEF),²⁴ traditional authority was gradually replaced with *circonscription* chiefs, canton chiefs and village chiefs appointed by the colonial administration and responsible for collecting head taxes (e.g., often “in kind”²⁵ such as rubber

²⁴ French Equatorial Africa was formed in 1910 by federation of three French colonies, Gabon, Middle Congo and Ubangi-Shari-Chad, eventually becoming the independent countries of Gabon, Congo Brazzaville, the Central African Republic and Chad.

²⁵ Goods or commodities as distinguished from money.

quotas) and recruiting laborers (Giles-Vernick, 2002; Boone, 2003). It is argued that head taxes encouraged local people to over-exploit resources to meet this demand (Giles-Vernick, 2002).

By the 1930s in French Equatorial Africa/*Afrique Équatoriale Française* (AEF) and Cameroon, the thinly distributed indigenous populations were obliged to regroup along roads, making everything from tax collection to health care and education easier for the colonial powers. Traditional hunting territories were abandoned or transformed and vast areas of the forest massifs that were too far from the roads returned to their wild state. This would have had a major impact on biodiversity as the mosaic of fallow agriculture and secondary forest/habitat it created would disappear. This remained the case until the end of the 20th century with the advent of commercial logging, which is fragmenting the forests and resulting in the impoverishment of wildlife linked to commercial bushmeat hunting (Vande weghe, 2004) (see Chapter 5, Section 5.9.4, Section, Forest Losses Linked to Over-Population, Agricultural and Land Scarcity, Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks And Protected Areas and Section 11.11.7, Case Study Bongo in the Congo [Brazzaville]).

In parts of French Equatorial Africa/*Afrique Équatoriale Française* (AEF), France also created *de facto* states providing large concessions to private companies with rights to mining, timber, wild rubber, wildlife and the creation of cocoa and coffee plantations (Giles-Vernick, 2002); this can be seen as a form of usurpation. According to Vande weghe (2004), in French Equatorial Africa this amounted to 40 concessions aimed at extracting resources at the lowest costs; initially rubber and ivory using inexpensive local manpower, and eventually agricultural products and timber. The French used repressive means to recruit workers by force, often by means of sending armed soldiers to raid villages. In the case of rubber, quotas

were established, which if not met could, as in the Belgium Congo (*Congo Belge*, today's Democratic Republic of Congo/DRC), result in beatings and forced labor without pay. This encouraged over-exploitation, so as to meet quotas at all costs. Those who did meet quotas were often under-paid by company agents using rigged balances. Profits were made by concessionaries paying Africans a pittance for the resources they harvested. Worker revolts were not uncommon (Giles-Vernick, 2002). Similarly, in German *Kamerun* (Cameroon) wild rubber quotas were established as part of a head tax, peaking in 1914 at 47,345 tons valued at US\$ 100 million (11.5 million *reichsmarks*) (von Meurers, 1999).

Indirect Rule

Where there were few resources, attempts at governance through indirect rule were made to administer the French colonies. This was accomplished through a limited presence using pre-existing political structures and traditional rulers as in Mauritania, Upper Volta (Burkina Faso), Chad and Niger. Zones occupied by nomadic groups living subsistence lifestyles with little economic value, *Afrique inutile*, were often left to govern themselves. People living in isolated largely inaccessible areas such as the desert and Sahelian regions (e.g., the Tuareg of Algeria, Mauritania, Mali, Chad, Niger and Nigeria) or the great lowland tropical hardwood forests (e.g., the Gold Coast, home of the Pygmies such as Southeast Cameroon and Congo Brazzaville) managed a considerable degree of autonomy, or indirect rule through non-incorporation as described by Boone (2003). In recent times, as is seen in this and later chapters, as their land becomes important for creation of parks and protected areas and/or logging, even these groups have been imposed upon by the state apparatus, often through usurpation and administrative occupation of their lands, resulting in further marginalization.

Indirect rule was based on the theories of Irish philosopher Burke, “Never entirely nor at once depart from antiquity” (Edmund Burke *In:* Elliot, 2001; Kurtz, 2003). Preserving existing political systems through co-opted traditional leaders calcified the evolution of indigenous political systems. Burke’s gradualism made colonial management easy. Nothing was supposed to happen, while the British plundered the resources of their colonies.

Indirect rule was employed by both the French (Dumont, 1966) and the English (Musah & Fayemi, 2000) with little understanding for the existing, deep-rooted social control of the residence groups, lineages, or ethnicities with regard to resource allocation (Kirk, 1997: *In:* McCarthy, Swallow, Kirk & Peter Hazell, 2000). Catherwood (2004) describes indirect rule as a means of minimal investment in manpower and money, used by the British in the form of the British Raj in India, sultans in Malaysia, Arab kings, to tribal chiefs in Africa, giving the appearance of independence, but controlled by Britain both to extract raw resources as cheaply as possible and to provide a market for British produced goods.

“With their ‘indirect rule’ and ‘native administration,’ the British recognized bundles of autochthonous rights at an early date. They thereby strengthened the position of kings, paramount chiefs, or ‘sheiks’ in pastoral societies, which they regarded as the legitimate authority system. This indigenous enforcement system intervenes as a third party with coercive power to defend the rights of individuals and groups...” (Kirk, 1997 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

Indirect Rule in Senegal

In Senegal, the residents of urban centers “The Four Communes” of Dakar, Goreé, Rufisque and Saint Louis were treated as French citizens; they were given the same education and rights, and competed and worked together with the French

in politics on an equal and integrated basis. This was maybe the only colony in tropical Africa where this occurred (Martin & O'Meara, 1995).²⁶ According to July (1970), this assimilation occurred mostly among *métis* (mixed African/European offspring) and a few Africans. However, the African elite from “The Four Communes” were more concerned about the rights of people in these urban centers than those in the rest of Senegal where 95% of the people lived (Martin & O'Meara, 1995). As in much of Africa, what happened in the urban centers had little impact on rural people (July, 1990). Eventually, Senegal’s first President, Léopold Senghor would sweep to power by aligning himself with the powerful rural Mouride *marabouts* of the Groundnut Basin and their followers, which contained over half the country’s population. This was done at the expense of the urban minority elite; a form of indirect rule through power sharing (Boone, 2003).

In the rural areas, the French dismantled the Wolof states [see Chapter 1, Section 1.4.7, Wolof (Djolof) Empire] and chose chiefs themselves based on knowledge of French and submissiveness to the Colonial power. With this, the traditional modes of social dependency were broken down, allowing Sheikh Amadou Bamba and his followers, under the Islamic Mouride Brotherhood to move in and take control over a large part of Senegal (BCC, 2006). Boone (2003) describes a rivalry between the rural *marabout* elite of Senegal’s Groundnut Basin and the urban bureaucratic elite that along with progressive planners, developers and agricultural experts in Dakar devised the idea of *animation rurale*. This was to free the suppressed peasants from the oppressive Wolof *marabouts*. Demonstrating the political power of the rural marabout elites, attempts at

²⁶ This practice continues in the 21st century in Cameroon where high level government officials (e.g., the president and his family, key ministers and their families) have dual citizenship (Cameroonian/French) and their children are educated in France (Biko'o, *pers. comm.*). It would be interesting to know how widespread this practice co-opting the political elite, is in former French/European colonies.

*animation rurale*²⁷ ended in the political crisis of 1962 in which the prime minister, progressive economist and ally of Senghor, Mamadou Dia, was removed from office, imprisoned and his followers purged from the ruling party and government bureaucracies. Usurpation by central government was extinguished in favor of power sharing between Dakar and the *marabouts* of Senegal Groundnut Basin. Unfortunately, in the case of Senegal, the rural elite, marabouts, were/are every bit as exploitative as the colonizers and urban elites (see Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal).

In addition, Senghor's wife was French. Jean Collin, was a Frenchman who took Senegalese nationality and married into the Senghor family (Mortimer, 2002). He was an advisor to both Presidents Senghor and Abdou Diouf, holding key positions from 1964 to 1988 and rising as high as *Ministre d'Etat, Secrétaire Général de la Présidence* under Diouf. Collin had previously served as Minister of Finance, Minister of the Interior and Minister of State in charge of the Interior (ANON, 2006). Also, Senghor's and Diouf's director of national parks until the mid-1980s was Andre Dupuy, a tough and dedicated ex-foreign legionnaire known as *mi colonel*. In most ministries, behind the scenes there was a French advisor. Thus, indirect rule existed between independent Senegal and the *marabouts*, and between France and its former colony. This relationship between France and its former colonies was probably stronger than between other newly independent states and any of the other former colonial powers in Sub-Saharan Africa.

²⁷ In the 1980s, the U.S. Peace Corps had an *animation rurale* program that placed Peace Corps Volunteers in villages, who were then to animate the village and seek small grants for "development projects". This program may have coined the words, *animation rurale* but had nothing to do with earlier politics. The impact of the U.S. Peace Corps program on rural livelihoods, though laudable, was negligible.

Usurpation/Direct Rule, the Casamance, Senegal

The usurpation of power in the Casamance of Senegal occurred as the Jola (Diola) culture lacked a political hierarchy of elites. The system consisted of very independent and decentralized villages linked through extended families and descent groups overseen by a patriarch/elder and intermediaries of spirit shrines that controlled land, agricultural production and social life. The extended family controlled access to its rice land and each nuclear family headed by a married man had control over its own share of family land. There was no land-controlling elite. With no elites with whom they could develop allegiances and administrative patronage systems, as a means of controlling peasant production systems to generate wealth for the mother country, the colonial (France) and post-colonial powers imposed military-like direct rule. This was exacerbated by the 1979 land rush by outsiders to the Lower Casamance. This action bypassed traditional allocation systems and had partially been provoked by government structures. Violence broke out in 1981 and continues in the 21st century as the Jola (Diola) of the Casamance are revolting against centralized rule from Dakar, with a guerrilla separatist movement vying for autonomy (Boone, 2003).

3.1.4.2 Anglophone Africa

In Nigeria, the “divide and rule” guided British policy. Disparities in education and religion were reinforced. In the north, the British limited Christian missions, restricted education, and strengthened the feudal rulers. In 1939, they divided Nigeria into three regions, each dominated by an ethnic group - the Hausa-Fulani in the north, the Yoruba in the southwest, and the Igbo in the southeast. The system fostered rivalries between regions and between the dominant ethnic group and minorities within each region (Booker & Minter, 2003). These examples are typical of what happened across the Continent in the non-settler colonies.

In what was to become part of Ghana, after fighting three wars that ended in defeat for the Asante (see Chapter 1, Section 1.4.8.1, Ashanti (Asante) Kingdom, modern day Ghana) in 1901, the British recognized the Asante Confederacy of states under control of a king (*asantehene*). The British governed through the existing political units and administrative hierarchies consisting of the paramount chief and a web of subordinate authorities. The system was held together by kinship and bonds of fealty between the paramount chief, divisional or wing chiefs, and village heads. The confederacy was reintegrated and strengthened by the British, who used it to govern the cocoa producing peasantry of Southern Ghana. The British enshrined into law the chiefs' claims over land and the right to demand land tribute from subjects, and the chiefs' ability to appropriate agricultural wealth indirectly in the form of political tribute and directly in the form of rent, interest and profit from cocoa growing peasants. This form of power sharing through indirect rule accentuated an indigenous social and political hierarchy in what is today south-central Ghana (Boone, 2003)

“The use of local authorities by the British (and French) colonial administration to exercise an indirect control over land led to a weakening of traditional structures” (Berry, 1992 *In:* Vanderlinde, 2000 *In:* McCarthy, *et al.*, 2000), sometimes because of their “*reconstruction*” (Cheater, 1990 *In:* Vanderlinde, 2000 *In:* McCarthy, *et al.*, 2000) as described above. Africans began to regard chiefs as agents of the colonizer (Mair, 1977; Martin & O’Meara, 1995). Both France and Britain also used African troops to fight their wars and to put down revolts in the rest of Africa; the West African troops such as the *Tirailleurs Senegalais* (Senegalese Riflemen) and the *Soave* (French colonial army, North Africa) of Francophone Africa or the Kings African Rifles in the British system became famous as fighting forces. Tens of thousands of Africans were recruited for WWI. However, for the masses, the colonial state was a foreign institution,

which operated according to unfamiliar rules and norms (Martin & O'Meara, 1995). Proxy wars, fought with African troops on the subcontinent, continue into the 21st century and are described in Chapter 13.

3.1.4.3 Portuguese Africa

The educated elite known as *assimilados* in Portuguese Africa, the *evolués* in the Belgian Congo and the “*mission-educated*” in British West and Central Africa were not allowed to engage in electoral politics (Martin & O'Meara, 1995). This was typical of the European presence in West Africa, rarely penetrating beyond the coast (July, 1970).

Thus “the configuration of rural society had a predictable effect on state building” often determined by endogenous political realities on the ground rather than by offices in Dakar, Paris, London (Boone, 2003) and Lisbon, and the value of the resources on their lands. This process of vying for control of valuable resources between central government and rural populations/factions continued through independence, is still being played out at the beginning of the 21st century and will be observed in case studies throughout this book.

3.1.5 Post WWII Sub-Saharan Africa

Following World War II, the European colonizers began improving the educational systems beyond primary schools. Britain's African colonies saw the establishment of high schools and universities, while the French government tended to send its students from its colonies off to France for their secondary and tertiary studies (Martin & O'Meara, 1995), thereby creating black Frenchmen (Rosenblum & Williamson, 1987). In the case of the French, this helped maintain the *francophonie* culture in Africa and trained Africans who were to become

functionaires (bureaucrats) in order to continue colonization from afar. In addition, this resulted in the strong ties that France still maintains with its former colonies to this day, more so than any other colonizer on the subcontinent.

From the principal author's own experience, as late as the 1980s in most of West Africa, the independent governments were hardly understood by the masses. In many instances, the children were provided with a more relevant education in the village koranic schools than in the government sponsored schools that mainly prepared them for work in "Western urban centers" (with limited opportunities in a non-existent private sector), and in over-staffed French installed bureaucracies. Koranic schools taught children how to better manage their land and their resources; little of this was initially known to the colonizers. The koranic schools were seen by the French to be backwards and repressive. In addition to religion, morality and discipline, something that 21st century schools in the West are lacking, koranic schools served as vocational schools teaching basic farming and resource management skills and passing on traditional knowledge to the next generation. Such training has unfortunately become somewhat passé as ever-growing rural populations have resulted in many traditional farming techniques, especially fallow agriculture, becoming redundant due to land scarcity.

In Senegal, the government had an impact on major urban centers such as Saint Louis, Dakar, Kaolack, and Tambacounda. This was the government created at the end of colonialism, which the West related to, but which had little impact on the day-to-day life of the majority of people living subsistence lifestyles. The rural areas had their own systems of governance dominated by *marabouts* or elders, and unless there was a need for food aid because of a drought or locusts, most people hardly needed or even understood what central or even provincial government was all about, though as noted above, with the displacement of traditional rulers, many *marabouts/rural elites manipulated/manipulate rural*

policy to their advantage in cahoots with central governments. “For most Africans, the state continues to have little meaning, as many people continue to operate outside of the ambit of its clutches” (Mohan & Zack-Williams, 2000 *In: Zack-Williams, 2002 In: Zack Williams, Frost & Thomson, 2002*). Parallel underground economies are more important to the majority than formal markets, something that is not easily measured by the World Bank/IMF and United Nations Development Program (UNDP).

3.1.6 Failure to Understand the Complexities of African Societies

Even the French, who attempted to use traditional rule, often failed to understand the complexities of African societies. This has impacted on how rural people relate to the Western governments left behind after colonialism. The French approached the royalty of the various ethnic groups in Senegal (Toucolor/Toucouleur, Serere, Wolof, Dioula/Dyula, Mandingo, Fulani/Peul, etc.) and asked them to give them their sons to be sent off for “*Western education*”. The elders and *marabouts* feared that they would never see their sons again and thus sent the sons of slaves to the French. This is believed to have been the case across much of West/Central Africa, in those areas where slavery was practiced.

The sons of slaves were trained as petty bureaucrats or soldiers, overseen by their colonial masters. Even to this day, slavery exists in West Africa among both whites (Mauritanians) (Tran, 2007) and blacks, even though it is officially outlawed. Thus, many of the high level government bureaucrats “*fonctionnaires*” who became the political elite were the descendants of slaves and were not readily accepted by the rural community, especially the descendants of royalty. Even in the 1980s, there was a well known Senegalese politician, a descendant of slaves, who was required to remain at the edge of villages and shout out his speeches during political campaigns, since as a descendant of slaves he was not allowed to

speak openly before the community under the village tree where important meetings were normally held. Thus, an educated and urbanized bureaucratic elite or *petite bourgeoisie* evolved, which stood in conflict against a rural uneducated royalty.

The creation of such relationships made it difficult for rural people to accept the authority of the state over the management of what most rural Africans saw as natural resources confiscated from them and mismanaged by petty bureaucrats, often to the latter's benefit. In addition, many of the bureaucrats, while descendants of slaves came from urban centers where the chances for secondary and tertiary education were the highest. Meanwhile, the descendants of rural royalty were not afforded equal access to Western education. Thus the cultural and social chasm between rural and urban areas, and between governments and resource users can be linked to how the colonizers related to the conquered; inadvertently educating the sons of slaves, and in more recent times educational systems favoring urbanites over rural people. These urban educated elite were and even today are being trained in Western conservation paradigms, often in Europe and the U.S., and placed in positions of power within resource management agencies with little or no sympathy or understanding for rural people and their ties to their resources. Though things are changing, the management style left behind in most of Francophone Africa from independence in the 1960s until the early 1990s was one of conflict, including separation from resources, repression and anti-poaching. This relationship, with few exceptions, was typical across the colonized subcontinent. Very often, one of the first steps that the urban-bureaucratic descendants of slave elite undertook at independence was to further marginalize any chance of the rural royal elite to impact on the politics of these countries.

René Dumont (1966) notes that “the most distressing result, from the viewpoint of African development, is the almost total lack of educated peasant elites”. He gives as an example an anti-peasant discrimination, where 75% of Bamako’s (capital of Mali) children were in school, but only 3% of the rural areas had children in Western style schools as opposed to Koranic schools. René Dumont believes the most profound evidence that Africa has made a “*false start*” is that in virtually every African country the socio-economic gulf between the peasant masses and the urban elites is greater than between these elites and the European and North American norm.

Ultimately, while the European settlers demanded all the rights of citizens living in democratic societies, they denied these same rights to Africans. This resulted in African hostility towards colonial rule and European domination, and is believed to have fueled the foment and discontent that led to the liberation wars of the 1950s to the 1980s (Martin & O’Meara, 1995).

3.1.7 Colonial Economies

Once Africa had been carved up among the colonial powers, the main objectives of colonization were to extract raw materials, create markets for European goods, and keep government costs and commitments low (Harper College, 2002; Lowenthal, 1997 *In:* Griffiths & Robin, 1997). Everything was reduced to crass materialism, which became the bane of parasitic colonial capitalism (Mafeje, 1994 *In:* Leistner, 2004). As is seen in Chapter 11, the ruling political elites at independence quickly adopted this culture of materialism, and as with colonialism do so at the expense of the masses, more often than not in collusion with the former colonial powers.

Men in charge of colonial lands tried in vain to stem the gutting of resources for short-term benefits, “making rich parents but poor children”. Many entrepreneurial practices were harmful to soils, vegetation, wildlife and even climate out of ignorance, greed or unconcern (Lowenthal, 1997). This attitude often continues in the 21st century, where multi-nationals are mining Africa’s timber, agriculture, wildlife, oil and minerals for short-term benefits with little regard for the people or the environment (see Chapters 5, 9, 11 and 13).

Peasant crops and livestock production were all but ignored in favor of export crops such as sugar, cotton, coffee, cacao and bananas produced as cheaply (meaning cheap labor) as possible for the home market. Land management and local employment were based on plantation regimes, which when abandoned often resulted in environmental and human tragedies (Lowenthal, 1997 *In:* Griffiths & Robin, 1997).

Many countries, such as Senegal and the Gambia, had their natural systems virtually eliminated as they were turned into mono-cultural economies to serve the needs of their colonial masters back home, in this case peanuts for cooking oil. Uganda and Kenya became coffee and tea estates, while the Ivory Coast grew bananas, coffee and cocoa (even in 2003 it was still the largest exporter in the world until the start of its civil war) and Liberia served as a rubber plantation.

Europeans were often subsidized, giving them a competitive advantage over emerging African entrepreneurs (e.g., Senegal) or emerging black commercial farmers (e.g., South Africa). In Kenya, African farmers were not allowed to grow coffee and other cash crops produced by white settlers. In Ivory Coast, French planters were paid a higher price for cocoa than African producers. They also used non-indigenous middlemen such as the Lebanese in West Africa or Asians in East Africa, to stifle African competition (Martin & O’Meara, 1995).

The white settler population was primarily concerned with acquiring land for plantation agriculture in attractive climates and having access to cheap labor for the mines and urban centers. In Southern Africa (e.g., Zimbabwe, Zambia, Namibia and South Africa) and East Africa (Kenya and Tanzania), the white farmers took the best agricultural land and crowded Africans on to “native reserves” similar to the Indian reservations of North America. Limiting opportunities for Africans to sell their produce on the world market, forbidding the cultivation of certain cash crops, head taxes, and compression into unsustainable land masses forced many young men to seek salaried but low paying wages on plantations, in mines or other European enterprises (Martin & O’Meara, 1995; Harper College, 2002). This is discussed in more detail in Chapter 5.

In West Africa and the Ugandan Protectorate, where colonial policies precluded large-scale European settlement and seizure of African communal lands, indigenous farmers were encouraged to grow cash crops to supply cocoa, coffee, cotton, peanuts and palm oil to European markets. The Europeans concentrated on controlling the export-import trade. However, the main beneficiaries tended to be “chiefs” and religious leaders who used their powers to allocate communal land and labor to become wealthy (Martin & O’Meara, 1995) (see Chapter 5, Section 5.6.1.8, Impacts of colonialism on traditional agriculture in Uganda). In the Groundnut Basin of Senegal, as late as the 1980s, some of the richest people in the country were the marabout holy leaders who extracted large payments from their peasant followers (see Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal), drove Mercedes Benzes (these elite called *Wa-Benz* in the Swahili of East Africa) and controlled the country’s politics (see Section 3.1.4.1, Francophone colonial Africa, Indirect Rule in Senegal).

As is discussed in forthcoming chapters, this resulted in the production of foodstuffs and raw minerals for the world market, most countries becoming reliant on one or two key export commodities (Martin & O'Meara, 1995) making them extremely vulnerable to volatile global market prices, which tended to favor the Western importing countries over the African producer exporting countries. As is discussed in Chapter 5, which deals with agriculture, development of cash crop economies on fragile soils, especially those of Sub-Saharan Africa's savannas had a profound effect on long-term soil fertility, social relations, nutrition, land ownership and distribution.

The increased demand for Africans' labor and/or control over how Africans used their land tended to provoke resistance rather than increase outputs and helped contribute to the rise of anti-colonial movements (Berry, 1993 *In:* Martin & O'Meara, 1995). Following the Great Depression of 1930 through to the 1950s there was a great demand for agricultural products and raw materials from Africa. By the mid-1950s and into the 1960s things began to change. World prices for African commodities began to fall. Foreign exchange fell as the price paid for raw products decreased, which in turn limited the ability to import finished products (Martin & O'Meara, 1995) (see Chapter 12, SUBSIDIES, FREE-TRADE, STRUCTURAL ADJUSTMENT AND DEBT RELIEF IN AFRICA IMPACTS ON RESOURCE EXPLOITATION).

3.1.7.1 Colonial investment in Africa

Although the colonial powers sought to induce or coerce Africans to produce crops and minerals for European markets, their effect on African economic growth was minimal. The colonial governments sought to secure a favorable environment for colonial enterprises. In East and Southern Africa, Europeans

acquired direct control of arable land, forests and minerals, and exported mostly primary products produced by European concerns. Nearly 75% of private European capital investment in Sub-Saharan Africa went to mineral exploiting regions, the Union of South Africa, South-West Africa (Namibia), Northern (Zambia) and Southern (Zimbabwe) Rhodesia and the Belgian Congo (Frankel, 1938 *In: Martin & O'Meara, 1995*).

3.1.7.2 Cultural genocide

Trevor Manuel, South Africa's finance minister, once quoted an African proverb; "Until the lions have spoken the only history will be that of the hunters" (Commission for Africa, 2005).

"In exchange for slaves, gum, ivory, gold and other 'real' riches, Europe introduced Africa to knick-knacks and trinkets, loincloths, jewels and tobacco, gunpowder and firearms (obsolete models) and worst of all alcohol" (Dumont, 1966).

Europeans began colonizing Africa over 500 years ago. The flow of wealth is still out of Africa, leaving it impoverished and often at war with itself.

As in North, South and Central America, the history of colonialization was devastating to African populations and cultures. Invading colonizers, from Arab Slave traders to European settlers, destroyed traditional ruling and social structures. This resulted in regressive societies. Societies were pushed into evolutionary dead-ends, in which both ruling elite and subjects were turned into rural subsistence peasants on lands that could not support them.

"In virtually every area of the world where colonization took place, indigenous peoples were subjected to intensive pressures to assimilate,

to become non-indigenous and therefore, to disappear...Indigenous peoples did not disappear, but rather they have endured. The pressure of assimilation efforts, however, often fractured their identities. These identities have been fortified in recent years as indigenous peoples have re-asserted their rights to traditional homelands and challenged the assumptions and mechanisms that resulted in their dispossession. In doing so, they have extracted concessions from the still-colonizing powers (often African governments manipulated and controlled by the former colonial powers, Western governments and donors or their multi-nationals) that govern them" (Hitchcock, 2003a).

In other instances, colonialization eliminated populations from possible competition with the colonizers. The human population in the Democratic Republic of Congo (DRC), the former *Congo Belge*, was cut in half from 20 to 10 million people between 1890 and 2020, while destroying traditional ruling systems. The DRC is still recovering from this trauma (Hochschild, 1998). Vande weghe (2004) states that the treatment of Africans in French Equatorial Africa/*Afrique Équatoriale Francaise* (AEF) in the sinister quest for rubber was every bit as cruel as in Congo Belge (DRC) resulting in the "rubber war" that raged until 1928 in the French colonies. For instance, found just south of the Franceville region along the Congo-Gabon border the Tsayi ethnic group was annihilated with only three out of 135 villages surviving. In fact, although the colonial period in Central Africa hardly lasted three-quarters of a century, in about a 40 year period ending around 1920, colonialism wiped out nearly 50% of the population of Central Africa from a combination of war, destruction, epidemics and famines (Vande weghe, 2004). In Namibia, the German colonizers cut the Herero population from an estimated 80,000 landed people to fewer than 20,000 landless people between 1903 and 1906 (Hochschild, 1998). Woods (2007) provides a figure of 65,000 Herero killed by the Germans, with 45% of those remaining (not going into exile) in Southwest Africa (Namibia) dieing of "malnutrition, disease, exhaustion, exposure, neglect and brutality". Similarly, a 1901 population of 20,000 Nama was reduced by the Germans to 9,810 by 1911 (Woods, 2007).

One of the worst tragedies in modern history was the supplying of slaves to the plantations of the New World. It is estimated that approximately 50 million Africans were torn from their motherland and taken to America as unwilling instruments in laying the foundations for Western capitalism. They were uprooted from their families and cultures, and sold off as chattel to become beasts of burden, to supply cotton from the emerging American colonies, or fruits, spices, and sugar cane from the Caribbean islands, Central and South America. Unequal exchange became characteristic of international commerce with Africa always at a disadvantage. African wealth from human beings to crops and precious minerals was exchanged for worthless articles like trinkets, mirrors and beads (Museveni, 1997). Leistner (2004) estimates that 22 million people were sold into slavery between 1500 and 1890 to the Americas, Middle East and elsewhere. The actual number of slaves arriving in the New World from the West Coast of Africa ranges from 10.2 million (Lovejoy, 2000) to 11.3 million (Thomas, 1997) to 15 million (Leistner, 2004), these numbers representing from 10% (White, 1993) to 70% (Mintz, 2003) of the actual number that survived between capture and arrival in the New World. Inikor (1992 *In:* Leistner, 2004) provides two estimates for the East Coast slave trade: 10 million sold into slavery from 1400-1900, the other 6,856,000 between 1500-1890.

When the colonial penetration into the interior of Africa began in earnest in the 19th century, it was evident that the slave trade had resulted in tragic social disruption and ethnic strife. Thus, the slave trade was finally stamped out at the end of the 19th century, not entirely on a moral basis but to help create peace, stability and an orderly administration, which could then efficiently supply raw products to the Mother country (Leistner, 2004).

3.1.8 Ecology, a Science of Empire

The establishment of ecology as a formal science occurred in 1866 and is associated with German zoologist Ernst Haeckel. Ecology is a combination of two Greek words, *oikos* meaning domicile of a planet and *logos* meaning origin or root – in this case of scientific knowledge. Thus, ecology is “the scientific study of the early dwelling place” or “home”. Haeckel used ecology to imply the study of organisms and how they relate to the natural environment as opposed to the laboratory. This then distinguishes ecology from biology, which is more about the structure and function of an organism and its systematics. The first professional society, the British Ecological Society was established in 1913 (Keller & Golley, 2000).

In America, the science of ecology was born in Midwestern agricultural colleges in the late 1800s as a means of studying changes in plant communities. In 1920, the American Ecological Society’s new journal, *Ecology*, first appeared, broadening this science to animal ecology, and changing it from a “pure” to an “applied” interdisciplinary biological science (Robin, 1997 *In: Griffiths & Robin, 1997*).

Contemporary ecology relies on physics, chemistry, molecular biology and the biology of the organism to discover natural patterns and processes that describe how organisms, groups of organisms, and interactions between organisms (e.g., predator – prey relationships) interact with and relate to the physical, chemical and biological components (e.g., vegetation, soils, climate, etc.). Discussed as an entity, these interactions are defined as an ecosystem.

Ecological imperialism suggests superhuman achievements of European expansion into the colonies, which brought with it the imposition of values and

management systems based on the Linnaean classification of plants and animals, and the concept of reserves and parks (i.e., preservation), which separated humans from nature. Indigenous management systems and knowledge were ignored (Keller & Golley, 2000).

Imperial settlers were hardly aware of the manipulation of nature by indigenous peoples. They assumed that the landscape they encountered for the first time was untouched “virgin territory”, “almost fresh from the Maker’s hands”. The French called what they believed to be unoccupied and unused lands ‘*terres vacantes et sans maître*’ even though they served as important reserves in the bush fallow agricultural cycle and/or for hunting and tree crop gathering (Zeba, 1998).

That indigenes without permanent farms or advanced tools, over millennia, profoundly altered New and Old World landscapes (including Africa), and were still doing so, went unrecognized. It suited colonial incomers to overlook signs of native alteration; the apparent absence of indigenous improvements, helping to justify the removal of indigenes from tribal lands to make way for the sophisticated European settler. European settlers were ill equipped to judge the impacts of semi-nomadic hunter gatherers, migratory pastoralists and shifting cultivators on the environment, especially the cumulative impacts of fire on vegetational communities. Indigenes, unable or unwilling to abandon “*primitive*” practices for permanent settlement were doomed to give way to the superior races with advanced technologies (Kjekshus, 1977; Lowenthal, 1997 *In:* Griffiths & Robin, 1997). In July, 1895 the Frenchman Jules Ferry declared that “ ‘The Declaration of the Rights of Man was not written for the Blacks of Equatorial Africa’ ” (Dumont, 1966). General Meynier (Meynier, 1911 *In:* Dumont, 1966) wrote,

“ ‘From the first day of their encounter, Europeans affirmed the principle of their superiority over the black race...They have forced

the Africans into slavery, justifying it on the basis of superior strength...To open markets for their trade in Africa, they have stamped out the last vestiges of African civilization. If one compares their (European) methods to the Berbers and even the Arabs, the parallel to this day does not favor the Europeans' ”.

This envisaged Europeans, moving out of Europe into Africa, North America, South America, Australia and New Zealand, creating Neo-Europe, unleashing an ecological/biological imperialism of crops, weeds, germs and pests that were imperialistic because of their ability to reign supreme over competitors and establish ecological dominance (Williams, 1997 *In:* Griffiths & Robin, 1997). In many instances, the European colonizer brought in anarchy and chaos, disrupting traditional management systems, imposing Western systems of governance on other cultures, while bringing indigenous systems to an evolutionary dead end, and ultimately taking away the self-respect and dignity of a once proud people through the creation of second class “indentured servants” to European settlers, a stigma that to this day may still be holding back the continent from the envisioned “African Renaissance”.

The Scottish missionary Robert Moffat perceived environmental control as the distinctive characteristic of the Christian, contrasted with the heathen African's alleged helplessness. For Sir Charles Eliot, Commissioner of the East Africa Protectorate at the turn of the 20th century, the problem with Africa was that the environment needed to be controlled and transformed. Eliot stated that

“Nations and races derive their characteristics largely from their surroundings, but on the other hand, man reclaims, disciplines and trains nature. The surface of Europe, Asia and North America has been submitted to this influence and discipline, but it has still to be applied to large parts of South America and Africa. Marshes must be drained, forests skillfully thinned, rivers taught to run in ordered course and not to afflict the land with drought or flood at their caprice; a way must be made across deserts and jungles, war must be waged

against fevers and other diseases whose physical causes are now mostly known" (MacKenzie, 1997 *In: Griffiths & Robin, 1997*).

The blind arrogance of the European colonizer failed to realize how advanced some of these societies were, favoring the pre-conceived prejudiced opinions of the early explorers and hunters that the Continent was a land of savages who would require the Judeo-Christian value system, work ethic and technologies to advance their civilizations. They failed to realize that the African landscape had already been modified, manipulated and controlled by humans through the use of fire, livestock and even iron tool technologies.

3.1.8.1 Ecology of an empire in Tanganyika and Kenya

Prior to 1890, pre-colonial Tanganyika (Tanzania) had an advanced agricultural society and, one could argue, the beginnings of an industrialized society. As described in the previous chapter a combination of livestock, fire and hunting had been used to "push back the bush" and the associated wildlife and tsetse fly, many of today's parks and protected areas having more people and cows than game during the pre-colonial period. Man had dominion over nature.

Comfort and plenty characterized the life among the majority of the people in 19th century Tanganyika. The skilled craftsmen, or *fundi*, were considered every bit as skilled as the best European craftsmen and ranged from forgers of spears and arrowheads to makers of shields, bows and arrows, hoes and tools, to cotton and bark cloth weavers, to boat builders, specialists in making traps, fishnets and sails, to gunsmiths. The transformation of raw products gave added value to these commodities and stimulated the local and regional economy. Irrigation was highly developed in the mountainous regions. Blacksmiths were known in every tribe; the transition from wood to iron hoes occurred in the early 19th century and is believed to have taken place in areas where a transition was made from "slash-

and-burn" agriculture with a long fallow period to a more sophisticated agriculture. The development of an inorganic salt industry is correlated to the development of agriculture and a diet dominated by vegetables as opposed to meat (Kjekshus, 1977).

Until out-competed by cheaper imports from America and Asia in the 1850s, cotton was grown with cotton-weaving industries beginning in Zanzibar and spreading to Kilwa on the East Coast, along the Rovuma River west to Lake Nyasa (Malawi) and in a border corridor from Lake Nyasa to Lake Tanganyika northward to Lake Victoria Nyanza. Additional commodities included pottery, cattle, donkeys, tobacco, bananas, robusta coffee, fish, grain (maize, millet, sorghum and rice) and ivory (Kjekshus, 1977).

Women-driven trading took place within ethnic groups. Border markets existed, where an exchange of goods took place between ethnic groups. Internal trade was believed to be more important than the external trade of slaves, ivory, etc., and indicated a relatively sophisticated agricultural economy in which food surpluses were marketed. The caravan trade from the coast even resulted in a regional market of 10,000 residents at Taveta (Kenya) around Mount Kilimanjaro. While introducing new crops and stimulating agricultural production, the caravan trade was nonetheless dwarfed by the number of people involved in the local markets and indigenous commodity trade (Kjekshus, 1977).

However, by the time the Europeans arrived in East Africa in the 1890s, this life had changed, mainly due to human, livestock and wildlife diseases inadvertently introduced by the colonizers, helping to solidify the latter's prejudices concerning the backwardness of the "natives". These catastrophic events combined with misdirected colonial policies from the 1890s through the mid-1900s resulted in

rural Tanzania's loss of control over nature and the eventual spread of bush (Kjekshus, 1977; MacKenzie, 1997; Chrétien, 2003):

- Rinderpest, believed to have been introduced by Europeans, devastated wildlife and cattle throughout East and Southern Africa;
- Small pox was introduced by Europeans/outsiders;
- The sand flea was introduced by Europeans through Angola;
- Locusts were linked to drought – wet cycles;
- The Maji Maji Rebellion of 1905 against colonialism;²⁸
- Food procurement for military purposes by Europeans linked to WWI;
- Colonial warfare with the Germans in WWI presented another European intervention;
- Forced labor by the Germans/Europeans;
- Famine associated with the above;
- Eventually, European imposed wildlife reserves; and
- Eventually, villages were concentrated as part of a tsetse control imposed by Europeans.

Vande weghe (2004) places the introduction of rinderpest via Djibouti in 1880. Wildlife, as it recovered quicker than livestock from rinderpest and sleeping sickness was favored over cattle. By 1937, 66% of the country, and thus prime wildlife habitat, was occupied by tsetse fly compared to 33% in 1913 (Kjekshus, 1977).

²⁸ “The *maji* or magic water, which was reputed to prevent German bullets from killing, came from a shallow well called Kisima Mkwanga just by Kingupira in the eastern Selous. The Germans applied a scorched earth policy – burning huts, laying waste and destroying crops. The Maji Maji fighters did the same against villages which did not join them” (Rodgers, 2005 *In: Baldus, 2005*).

The combination of these events resulted in the de-development and impoverishment of rural Tanzanians. It is estimated that 750,000 people died of hunger between 1894 and 1899. Also, it is estimated that human populations in the East Africa/Great Lakes region did not return to pre-1890s levels until the 1950s (Chrétien, 2003). At a crucial stage in the retreat of man and cattle from the advancement of nature, a new ecological balance was established in which “nature” and “not man” was in control (Kjekshus, 1977; MacKenzie, 1997).

The arrival of the colonial powers at this time failed to realize the changes that had taken place, resulting in a breakdown in interaction between the two civilized societies. The colonizers saw East Africa as nothing but ‘blank, uninteresting, brutal barbarism,’ mistakenly judging the conditions of life in this period to represent the height of East African development (Eliot, 1903 *In:* Kjekshus, 1977). What had been a peaceful relationship between herders and agriculturists, in which trade was implicit and mutually beneficial, broke down, as starving pastoralists began raiding to survive (Sander, 1893 *In:* Kjekshus, 1977). Kjekshus (1977) believes that the intense tribal raiding the Germans experienced was the direct consequence of economic losses suffered initially through rinderpest. Similar events also occurred in Kenya (Dublin, 1991 *In:* McCann, 1999) and Uganda (Hulme, 1997) resulting in comparable disruptions in the society and ecology.

Spreading southward, it is estimated that around 1896 rinderpest killed 500,000 cattle in Rhodesia, 600,000 cattle in the land of Khama (Botswana) – 90% of the livestock population, 1 million cattle in the Transvaal – 67% of the livestock population (Doctari, 2005) and 60% of Southwest Africa’s (Namibia) cattle (Woods, 2007). The disease broke through the fenced Orange River barrier in March 1897. By that time, Drs. Koch and Theiler²⁹ had developed both a bile

²⁹ Founder of world-renowned Onderstepoort Veterinary Research Laboratory, South Africa.

method and a serum virus method of immunization. Quarantine, control and immunization allowed 67% of the cattle in the Cape Colony to survive. Although this disease pandemic was finally stamped out in 1898, it re-appeared in 1900 in South West Africa (Namibia) and in 1901 in Basutoland (Lesotho). It was finally eradicated from South Africa in 1905, after a total loss in South Africa alone of 2.5 million heads of cattle (Doctari, 2005).

Rinderpest was seen as a subduing force aiding the colonial takeover, by taking the fight out of the war-like Maasai (Lugard 1893 *In: Kjekshus, 1977*). Because the Maasai were totally dependent upon cattle for food, an estimated 66% of the Maasai tribe died (Baumann, 1894 *In: Kjekshus, 1977*). While Baumann found that the warriors survived through hunting and petty thieving, the majority of the Maasai lived as beggars among neighboring peasants. Lugard (1893 *In: Kjekshus, 1977*) found that 90% or more of the cattle died in Kenya and Uganda. While agricultural societies could avoid starvation with their crops, the nomadic pastoralists were starving to death. It is estimated that 95% of all cattle died in East Africa (Sharpe, 1893; Stuhlmann, 1894 both *In: Kjekshus, 1977*), resulting in one of the “twin pillars” of the traditional economy – the lifeline of the people – being torn away (Kjekshus, 1977).

Further south, the vision of the famed missionary David Livingstone was one of vast cotton fields down the banks of the Zambezi River populated by the poor of central Scotland (MacKenzie, 1997 *In: Griffiths & Robin, 1997*). Was it this same eco-imperialistic vision of man’s ability to control and manipulate his environment in the 1970s/80s, that led planners to ignore traditional production systems, resulting in the displacement of between 500,000 and 800,000 people on the Senegal River from the construction of dams and planned irrigation which ended up proving economically and ecologically unviable (see Chapter 7, Section

7.9.1, Dam Impacts on Displacement of People and Section 7.9.1.1, Senegal River)?

All of this was occurring at a time when the sciences were professionalizing and the ideology was developing of scientific colonialism that could socially engineer African societies to improve their lifestyles. Colonialism conferred tremendous power on the sciences, which became tools of the empire to solve human and administrative problems and increase human progress. Ecology was seen as a means of linking the fields of natural and social sciences. In 1929, the African Survey carried out by British ecologists, botanists, entomologists, zoologists, soil scientists and veterinarians emphasized the importance of local knowledge and the ability of Africans to sustainably manage their environment, contrary to popular belief. This included an intimate knowledge of soils and other factors that once lost by the imposition of often inappropriate colonial practices, was difficult to recover. In some cases traditional slash and burn fallow agriculture (*chitemene/jachère*) of nutrient poor soils provided better yields than imported European methods, assuming the area of land relative to the population was large enough. Africans practiced crop rotation, anti-erosion methods and fertility enhancing practices (Tilly, 2003 *In:* Beinart & McGregor, 2003) (see Chapter 2, Section 2.3, TRADITIONAL MANAGEMENT OF LAND, AGRICULTURAL AND PASTURE).

Lately, the view of indigenes' impact on nature has been turned upside down, with tribal people across the world being heralded as ecological gurus whose reverence for nature is held necessary to repair the ravages of technological greed. However, just as indigenes changed their environment more radically than settlers realized, they also wrought environmental havoc such as the extinction of the moas in New Zealand, soil exhaustion in central Mexico, salinization in the Tigris/Euphrates and wholesale ecocide among Arizona's Anazasi and

Guatemalan Mayans. To view indigenes as incapable of harm is as dehumanizing as earlier notions that they could do no good. Romantic primitivism jeopardizes the ability to rationally assess the impacts of peoples on their environment (Lowenthal, 1997 *In:* Griffiths & Robin, 1997; Diamond, 2005). Sahelian civilizations (see Chapter 1, Section 1.4, WEST AFRICAN KINGDOMS AND EMPIRES) and Mwanamutapa (Great Zimbabwe) (see 1.7.3.2, Chapter 1), among others, provide examples in the demise of Sub-Saharan African civilizations from apparent over-population and mismanagement of natural resources, ultimately a major reason for the Bantu migrations off the Adamoua Plateau of Central Africa and their continued movement east and southward to the Cape (see Chapter 1, Section 1.7, BANTU AFRICA).

3.1.8.2 Natural resources in early colonial Africa

“At the time when explorers established contact with Africa and pushed further inland and developed a lucrative trade in spices, ivory, and forest products in exchange for alcohol and various manufactured goods, the prevailing development ideology in Europe was based on the Old Testament idea expressed in Genesis (1:26-28) that God gave man ‘dominion over the fish of the sea, over the fowl of the air, and over every living thing that moveth upon the earth’” (Benneh, Morgan & Utto, 1996). “‘The fear and dread of you will fall upon all the beasts of the earth and all the birds of the air, upon every creature that moves along the ground, and upon all the fish of the sea. They are given into your hands. Everything that lives and moves will be food for you. Just as I gave you green plants, I now give you everything’” (God to Noah, *In:* Genesis 9:2-3, *In:* Giles-Vernick, 2002). “Consequently, it was generally believed that humans (synonymous with Europeans) had the right to exploit the natural resources of Africa and other parts of the world as desired” (Benneh, *et al.*, 1996).

“No serious effort was made to conserve natural resources until late in the 18th century when it was observed that with the extinction of the dodo in Mauritius it became necessary for measures to be taken to ensure the survival of diverse species of

organisms through the establishment of reserves. The establishment of colonial spheres of influence and the arrival of Christianity, which in some areas preceded colonial administrations, dealt a death blow to the appreciation of ecologically sound sustainable traditional or indigenous resource management strategies, practices, systems, attitudes, and behavior patterns in African culture. This was most pronounced where these practices were applied as taboos associated with traditional African religion. It is not surprising, therefore, that taboos dealing with hunting and fishing were abolished outright and in agriculture such practices as inter-cropping were regarded as primitive. With colonialism came changes in the African perspective of looking at things, Westernization, and the propensity for consumption patterns of a more materialistic kind that are satisfied only with imports of food and manufactured goods, leading to increasing dependence on the developed countries" (Benneh, *et al.*, 1996).

Thus, much of America and Africa were "conquered" by Whites through chopping down forests, fencing and creating a mosaic of rectangular landholdings. Europe's landscapes, culture and values were exported to and imposed on the rest of the world. These continents were tamed with a bible and a gun in the name of God. "The Judaeo-Christian doctrine of much of the Western world dictates that man is separate from, and master of the environment and all living things, whereas many other cultures tend to view themselves far more as an integral part of the environment" (Suchet, 1998 *In:* Roe, Mayers, Grieg-Gran, Kothari, Fabricius & Hughes, 2000). Vande weghe (2004) argues that the destruction and manipulation of traditional cultures and beliefs/rites that tempered the taking of natural resources and the adoption of a Christian philosophy encouraged over-exploitation in the name of God as both the right of man and a gift from the Creator that no one dares refuse and that is "appropriate to gather before someone else does".

3.2 WILDLIFE AS A TOOL OF CONQUEST, PLUNDERING AFRICA'S WILDLIFE RESOURCES BY EARLY EUROPEAN SETTLERS

“What a century it had been! What a shoot! There had never been anything like it before – and there would never be anything like it again. The mood was set in the first year of the 1800s when the British Governor at the Cape, Sir George Young, granted ‘liberty to all persons beyond 30 miles from Cape Town to kill game at all seasons without license or prohibition’ (*Pringle, 1982*).

Wildlife became a resource of European conquest (MacKenzie, 1997), providing income (e.g. ivory and skins) (Dorst, 1970; MacKenzie, 1997), a cheap source of meat and a means of “penetrating the country by feeding the natives” (Bell, 1923 *In: MacKenzie, 1997*) – a temporary subsidy in opening up the Continent. Wildlife was also seen to stand in the way of “Civilization and Christianity”, competing for space and pasture with livestock, its eradication being a necessary prerequisite to European imperialism. Books by explorers, ivory hunters and adventure seekers, mostly English and Scottish, many ex-military officers and royalty such as William Cornwallis Harris (1844), R. Gordon Cumming (1850), William Charles Baldwin (1863), Frederick Courteney Selous (1881), Arthur H. Neumann (1898), Arnold W. Hodson (1912), James Sutherland (1912), Owen Letcher (1913), C.H. Stigand (1913), William Finaughty (1916), W.D.M. Bell (1923) and Dennis D. Lyell (1924) promoted the myth of wild, untamed Africa, a savage land, adventure, manliness, nobility and courage. This served as a magnet to draw the hopeless European masses to this land of plenty, where with only a gun and oxcart one could get rich quickly or find wide open spaces on which to settle, where a nobody could become somebody, a luxury in over-populated and class-conscious Europe. A similar cry in the 1800s, “Go West Young Man, Go West”, encouraged European immigrants to America to seek their fortunes, pushing aside the Red Indian and slaughtering the wildlife (e.g., bison and beaver)

for meat and money with ox-cart and musket/long-rifle in seeking their fortunes. In both cases, some became rich, and many died along the way from resisting indigenes, disease and thirst (see Section 3.12, COMPARISON WITH EUROPEAN COLONIZATION OF NORTH AMERICA).

3.2.1 Wildlife as a Tool of Conquest in Southern Africa

In Southern Africa, this attitude towards wildlife resulted in the asset stripping of game, being worked out like a mineral seam (MacKenzie, 1997). In 1652, van Riebeeck reported that a French ship in Saldanha Bay had harvested 48,000 seals for their skins and oil over a six month period from around Dassen Island. By 1656, there were no more seals to be caught in that bay, taking van Riebeeck's men of the Dutch East India Company three years to harvest 48,000 seals that the French had taken in six months (Pringle, 1982).

The Africans, and Boer Afrikaner settler of Dutch, German and Huguenot descent, who often collaborated in market-hunting, saw wildlife much differently than the “sporting” English gentlemen that were to follow in their footsteps. To the Boers, wildlife had a utilitarian value for trade and food, and was viewed as an obstacle to modernization and agriculture. Boer hunting parties usually consisted of numerous armed *zwarteskutters* (black shots) or *jagtkaffers* (hunting *kaffirs*), in an equitable partnership. They could not understand how anyone could kill for pleasure, keeping only the trophy while foregoing the value of the meat and skin. Commercially valuable wildlife provided the Boers with a viable economic base, which allowed them to assert their independence as they moved into the interior to escape the ever-increasing authority of the British in the Cape (Carruthers, 1995).

Only three large mammal species in Southern Africa have been driven to extinction in the past 300 years (Cumming, 2004 *In: Child*, 2004a). The bluebok (*Hippotragus leucophaeus*) of South Africa was extinct by 1800 (Bonner, 1993), and the quagga (*Equus quagga*) by about 1870 (Dorst, 1970; Pringle, 1982; Bonner, 1993). By 1860, the Cape warthog, *Phacochoerus aethiopicus aethiopicus*, was also extinct (Grubb, 1993 *In: Oliver*, 1993).

When the Scottish hunter and adventurer Gordon Cumming began his travels in 1843 he observed, “I was astonished at the number of skeletons and well-bleached skulls with which the plains were covered. Hundreds of skulls of springbok (*Antidorcas marsupialis*) and black wildebeest (white-tailed gnu) (*Connochaetes gnou*) were strewed around wherever the hunter turned his eye” (Pringle, 1982). It is believed in the 1700s there were 500,000,000 springbok between the southernmost limits of the Karoo and the Kalahari Desert of South Africa and Namibia (Cattrick, 1959). They often migrated in herds from 100s of thousands (Skinner & Smithers, 1990) up to 10,000,000 animals (Cattrick, 1959), forming bands as much as 161 kilometers (100 miles) long by 24 kilometers (15 miles) wide in an unbroken mass. This gave the veld a whitish tint as if covered with a light snow fall (Cronwright-Schreiner, 1925 *In: Skinner & Smithers*, 1990). In the Orange Free State, in the 1870s, 1 million antelope skins were being exported annually (Mackenzie, 1997). Although the exact figures may be debated, what cannot be disputed is that these great springbok migrations had nearly come to an end by 1896, victims of guns, clubs, advancing civilization, and the cows and sheep that devoured their pasture (Cattrick, 1959).

South Africa was estimated to have had 100,000 elephants (*Loxodonta africana*) in the 1650s (Wels, 2000). In the Old Transvaal, an estimated 90,000 kg of ivory was exported in 1855 alone, as well as vast quantities of hide and horn (Carruthers, 1995). The elephant, white rhino, Cape Mountain Zebra, bontebok

and black wildebeest were on the verge of extinction in Southern Africa by the turn of the century (Dorst, 1970; African Advisory Board, 2000a), (Table 3.1).

Table 3.1 Dates and estimated numbers on the near extinction of key mega-fauna in Southern Africa				
MEGA-FAUNA	DATE	NUMBERS	SOURCE	SPECIES
Elephant South Africa (SA)	1920s	120	Hall-Martin, <i>pers. comm.</i> (1)	<i>Loxodonta africana</i>
Zimbabwe	1900	<4,000	Cumming, <i>pers. comm.</i> (2)	
Namibia	1900	300	Lindique, 1995	
White Rhino (SA)	1895	20	Emslie & Brooks, 1999	<i>Ceratotherium simum</i>
Cape Mountain Zebra (SA)	1922	400	Lloyd, <i>pers. comm.</i> (3)	<i>Equus zebra zebra</i>
Bontebok (SA)	1927	120	Heard (4); Vrahimis(5) <i>pers. comm.</i>	<i>Damaliscus dorcas dorcas</i>
Black Wildebeest (SA)	1890	550	Vrahimis, <i>pers. comm.</i> (5).	<i>Connochaetes gnou</i>
1. Anthony Hall-Martin, South African National Parks (SANparks) 2. David Cumming, WWF/Zimbabwe, Harare 3. Peter Lloyd, Principle Nature Conservation Scientist, Cape Nature Conservation, South Africa 4. Duncan Heard, Cape Nature Conservation, Private Bag 9086, Cape Town, South Africa 5. Savvas Vrahimis, Environmental Affairs and Tourism, Free State, South Africa				
Source: African Advisory Board (2000a) . Prepared by principal author.				
Note: SA = South Africa				

With little regard for the law and few people bothering to acquire hunting licenses, by the mid-1890s the possibility of extinction of all game in the Transvaal had become a real concern (Carruthers, 1995). By 1893, there was so little game left in South Africa that many Afrikaners had to revert to target practice to replace hunting (Bryden, 1893 *In: MacKenzie, 1997*). With the loss of most of the livestock from rinderpest, which swept down from East Africa in 1896, drought and a locust plague, the Transvaal was obliged to suspend hunting restrictions to allow the destitute public access to wildlife as a means of survival. The destruction of wildlife was condoned and even encouraged in the belief that it

was implicated in the spread of disease (Carruthers, 1995). An incredibly rich fauna was thus systematically destroyed in less than a century.

The rest of the African subcontinent followed, large mammals vanishing with the advancement of European civilization (Dorst, 1970). Even as late as 1917, hunters flocked to Natal in a free-for-all slaughter of wildlife to clear the bush of tsetse fly and the carriers of sleeping sickness so that cattle could be maintained. An estimated 25,000 (blue) wildebeest (*Connochaetes taurinus taurinus*) alone were exterminated in a single campaign. In 1929, 15,130 zebras were exterminated, the total numbers of wildlife killed in the name of tsetse control amounting to 138,529 (Rosenblum & Williamson, 1987). This slaughter continued into the 1950s when chemical traps and biological control were able to virtually wipe out the tsetse fly in South Africa (Rosenblum & Williamson, 1990). In attempting to control the tsetse fly, nearly a million head of wildlife were removed in Zimbabwe, a process that continued into the 1970s (Bond, Child, de la Harpe, Jones, Barnes & Anderson, 2004 *In: Child, 2004a*) (also see Chapter 7, Section 7.8.10.2, Kariba Reservoir, Zimbabwe, Zambezi River). It was only after wildlife had served its role as a subsidy of conquest that the colonial powers began to restrict the harvest of wildlife for “sport” (MacKenzie, 1997).

Southern Africa was not alone.

3.2.2 Wildlife as a Tool of Conquest in Francophone Africa

Hunting casts (guilds, *confréries de chasseurs*) existed among all tribal groups (see Chapter 2, Section 2.1.6, Hunting Guilds as a Means of Controlling Access to Wildlife). They provided meat for the community managed as a “*Common Property Resource*”. Apprenticeships limiting access, taboos, totems and primitive weapons made over-harvest difficult. The coming of the Europeans and their modern firearms resulted in a slaughter of the game: 1) to feed workers in

“developing” and opening up Africa, and 2) for commercial purposes (Tré-Hardy, 1997; Giles-Vernick, 2002). It is estimated that between 1608 and 1612, 23,000 kg/year of ivory was imported to Holland alone, mostly from West Africa (Wels, 2000). In 1909, just one forest concessionaire, the N’Goko-Sangha Company from the Sangha Basin of French Equatorial Africa/*Afrique Équatoriale Francaise* (AEF), exported 6,625 kg of ivory. When another company, *Compagnie Forestière de la Sangha-Oubangui* (CFSO), took over this concession, its annual exports fluctuated between 2,694 kg in 1911 to 4,105 kg in 1917 (Giles-Vernick, 2002). Ivory exports from German *Kamerun* (Cameroon) were valued at US\$ 5 million (530,000 *reichsmarks*) in 1914, while at the same time in German East Africa (modern Tanzania) exported ivory was valued at only US\$ 3.4 million (360,000 *reichsmarks*) and US\$ 400,000 (40,000 *reichsmarks*) from Togo. The peak export of ivory from Kamerun was valued at US\$ 10 million (1.27 *reichsmarks*) in 1905 up from an average of US\$ 8.5 million/year (900,000 *reichsmarks*/year), a consequence today being that Cameroon has few if any big tuskers (von Meurers, 1999), making one wonder if such harvests resulted in elimination of the genetic trait for large tusked elephants. Between 1937 and 1939, 200,000 elephants were killed in the Belgian Congo (today’s Democratic Republic of Congo) for ivory (Wels, 2000). As late as 1953, 750,000 skins, chiefly duiker were exported out of the French Union in Africa (Marty, 1955 *In:* Dorst, 1970). It is estimated that 2 million duikers were being killed annually for their hides in Francophone Africa south of the Sahara during this same period (Dorst, 1970). One concessionaire in the Sangha Basin, *Maison Coulon et Wiart*, exported 10,351 antelope (most likely duiker since this is largely a forested environment) skins in the second trimester of 1934 to as many as 33,248 in the final trimester of 1935 (Giles-Vernick, 2002). Wildlife became an “open access” resource in which harvests went uncontrolled. This same “*get rich quick*” mentality is believed to exist today in the exploitation of Central Africa’s timber and bushmeat resources.

3.2.3 Wildlife as a Tool of Conquest in East Africa

In colonial Kenya until 1976, there was a legitimate trade in valuable skins such as leopard and zebra, legally harvested by landowners from animals killed in defense of property. During WWII, zebra and wildebeest were harvested to feed prisoners-of-war; the first time that sustainable harvesting of large numbers of plains game was proven feasible (Blankenship, Parker & Qvortrup, 1990).

“When Germany, a latecomer to European colonial expansion, declared Tanganyika a Protectorate in 1885, the slaughter of the elephants had already surpassed its peak and elephants were becoming rare. Two hundred tons of ivory was exported every year from Zanzibar, the equivalent of some 12,000 elephants. Commercial hunters could buy licenses to shoot elephants for their ivory” (Baldus, 2005 *In:* Baldus, 2005).

From 1903-1911, a total of 256 tons of ivory was exported from Tanganyika (today’s Tanzania), representing approximately 1,200 to 1,500 elephants killed/year with the likelihood that significant amounts of ivory were smuggled out of Tanzania on *dhow*s in order to avoid the 15% export tax of the Kaiser. During this same period (1902-1911), 53 tons of rhino horns were exported, representing 2,000 to 2,300 rhinos shot/year, while 1,000 live animals, 50 tons of antelope horns and 2.7 tons of valuable bird feathers were exported to Germany (Baldus, 2001).

In Somaliland alone 350,000 dikdik skins/year (*Madoqua sp.* and *Rhynchotragus sp.*) and about 70,000 antelope skins/year were exported, 80% of which were giraffe (*Giraffa camelopardalis reticulata*), gazelles (*Gazella spp.*) and gerenuk (*Litocranius walleri*) (Funaioli & Simonetta, 1961 *In:* Dorst, 1970). Even as early as 1905, Commissioner E. J. Swayne observed a major decline in game populations, not attributed to disease or native hunting but modern rifles used

mostly by 500-600 European sportsmen and military officers and their *Sepoys* (soldiers from India), who shot as much as they wished (MacKenzie, 1997).

3.2.4 Other Causes for Decline in Wildlife

Between 1889 to the early 1900s, the rinderpest epidemic nearly wiped out buffalo, giraffe, eland, etc. in East and Southern Africa (MacKenzie, 1997) (see Section 3.1.8.1, Ecology of an empire in Tanganyika and Kenya).

3.3 PERCEPTION THAT AFRICANS WERE THE CAUSE FOR WILDLIFE DECLINE

“Thus although Africans themselves played no direct part in shaping the conservation laws which were framed in the early 20th century Transvaal, white perceptions that Africans destroyed vast numbers of wildlife, that they trespassed in order to do so, that they killed in a cruel manner, that they spoilt the recreation of sportsmen and managed to evade wage labor by subsisting on wildlife, determined to a considerable extent the kind of protectionist ethos that emerged” (Carruthers, 1995).

Beinart (1989, *In:* Fabricius, Koch & Magome, 2001) draws similar conclusions, namely that biltong hunting by poor whites and Africans was perceived as laziness and a desire to avoid wage labor.

The perception of the colonial masters was that Africans were the reason for declining wildlife numbers (MacKenzie, 1997; Carruthers, 1995, Adams, 2003 *In:* Adams & Mulligan, 2003). Even though Africans had co-evolved with wildlife as described in Chapter 1 (Section 1.3, CO-EVOLUTION OF MAN AND WILDLIFE IN SUB-SAHARAN AFRICA) and had sustainably used their wildlife for 1000s of years (see Chapter 2, Section 2.1, TRADITIONAL

HUNTING AND WILDLIFE MANAGEMENT), the colonial powers failed to recognize that it was the coming of the European, with superior technology, the “modern firearm”, and the commercialization of wildlife in a way that Africa had never seen, along with his desire to have dominion over nature (e.g., fencing the land, conversion of natural systems into cultivated land and competition with livestock for pasture) that brought a number of species to extinction or near extinction. This was eventually compounded by the human and corresponding livestock population explosions on the subcontinent in the 20th century.

However, in the early 1900s game wardens of the British East Africa Protectorate (Kenya) were concerned that European settlement, not rural Africans, whom they considered co-existing with wildlife, were the real problem, “...it was no longer possible to continue the compulsory preservation of large herds of gregarious species of game on the areas which were occupied by white colonialists...If success is to be attained, it is essential that the regulations dealing with the preservation of game should meet with the approval and support of the body of colonialists who have to live under such regulations...” (ANON, 1911 *In: Blankenship, et al.*, 1990). By the 1909 Game Ordinance, landowners were allowed to destroy animals competing with them, and indigenous people reliant on wildlife for food were allowed to continue traditional hunting (Blankenship, *et al.*, 1990). Only hunter gatherers were allowed to hunt game, while it was considered regressive for African agriculturists and pastoralists to hunt (MacKenzie, 1997) without any regard for cultural ties to the hunt or game as a hedge against disease and drought. However, according to Blankenship, *et al.* (1990) indigenous people were never accorded the liberal policy implied in this ordinance, later ordinances completely ignoring their traditions, with Africans being blamed for the demise of wildlife. “Every African is a poacher...in Kenya one recognizes no customary hunting rights though certain sub-tribes such as the Tharaka in Kitui, the Teita in Voi and the Wasanye (Waliangulu) in the Coast

Province, not to mention the forest dwelling Dorobo are nearly all full time hunters" (ANON, 1955 *In Blankenship, et al.*, 1990). Since about 1920, despite the importance of subsistence hunting, people in Kenya were prosecuted for poaching, while licensed hunting was too expensive for most Africans and access to modern firearms was greatly restricted (Blankenship, *et al.*, 1990).

In French Equatorial Africa/*Afrique Équatoriale Française* (AEF) after 1910, colonial officials began to express concern over the fate of game. By 1930, Saint Floris, the inspector for hunting in the AEF raised concern that elephants had nearly disappeared in the AEF, while exploitation continued despite the lack of big tuskers. Africans were blamed for this over-hunting, and not the private commercial companies mining the region's rubber, ivory, skins, soils and eventually timber, who used and exploited Africans to harvest game (Giles-Vernick, 2002).

Similarly, excerpts from James Stevenson-Hamilton (1937) describe South Africa's lowveld hunters of the late 1800s operating in and around today's Kruger National Park as far from being ethical and a major reason for the decline in wildlife.

"Among the real old timers of the low-veld, of whom Bill Sanderson was typical, no characteristic was so prominent as was the pride which they took in their skill with the rifle. They were as proud of their shooting powers as any society belle of her personal attractions, and were as jealous of their rivals in this respect as a young man might be of a competitor in love. You might asperse their morals, their personal appearance, even their honesty, and be pardoned; but to cast a slight on their marksmanship was an insult not to be forgiven. Men of both British and Dutch race were numbered among these old hands...Their methods were not always such as recommend themselves to sportsmen; they had seldom regard for sex or age, or for the number of animals they might kill, in fact the main consideration was the largest number killed in the

shortest time, with the least expenditure of ammunition, subject to it being deemed unbecoming to fire at any but a running buck...All these old hunters (Erasmus, the Glynnss, Schoeman, etc.) were invariably equipped with the best and most modern of breechloading firearms, in those days Westley Richards and Martini-Henry falling block or double-barreled express rifles, firing black powder. Smokeless powder and magazine small-bore rifles had not yet come into use – happily for the game, which otherwise would no doubt have been entirely exterminated, for all were magnificent shots, splendidly mounted and quite ruthless in their methods, while trek Boers who came down in large numbers each year for winter grazing, also shot everything they could come across...There was no hunting ethics whatever. If a man did not succeed in killing an animal he had fired at, the next best thing for his own glorification was to have wounded it. 'Well I did not actually get anything to-day, but I wounded a lot of them,' was quite an ordinary remark to hear in a bar in 1902...Buffalo were the most profitable game, and as they were numerous in fly country, it was against them that the chief efforts were directed...Professional hunters in the old days had no use for lions as game; the skins having no marketable value, they were regarded merely as vermin, killers of creatures which should rightfully belong to the human predatory animal; when shot, they were generally left where they fell".

3.4 DEVELOPMENT OF AN ENVIRONMENTAL CONSCIENCE AND EXCLUSION OF AFRICANS FROM LEGALLY ACCESSING WILDLIFE

"African communities have hunted for many years. One could even say we were the first hunters. However, over the last two centuries the colonial governments outlawed the way we hunt, as they took control of our natural resources. It must be remembered that it was only after the arrival of white hunters with their vast firepower and greedy hunting zeal that we needed to create protected areas to stop the killing to extinction of the big five" (RSA Community Organizations, 2005).

Once the scramble for Africa was over and the continent had been carved up, it belonged to everyone but native Africans. At the beginning of the 20th century,

an “*environmental conscience*” began to develop and the European, especially the British ideas of “*sporting*” and “*fair chase*” were put forth upon which eventual game laws would be based.

The culture of hunting in Europe was turned into part of the culture of European Imperialism in Africa. This imperialism was largely masculine and elitist, symbolized by the “mounted trophy” from the hunt. The taking of life through hunting was viewed as a necessary training for European conquest and war (MacKenzie, 1997). Hunting was also closely connected to the study of natural history, with expeditions collecting specimens from the imperial world for “European” museums and taxonomists (MacKenzie, 1997).

European imperialism also excluded Africans and their traditional hunting methods as “un-sporting”, and “not fair chase”, failing to recognize that the Africans had always conserved wildlife and habitat as part of their cultural heritage and survival network (see Ethics below).

3.4.1 Centralized Control of Natural Resources and the Arrival of Conservation

Subjecting natural resources to some measure of central control has been an important element in the establishment of most Western states and in the formation of colonial states in particular. Such interventions have been designed to regulate use, to privilege access for particular, often dominant, social groups (in colonial times European settlers, today Western NGO’s and rich tourists from America and Europe) and in some cases to conserve resources. This has cut across existing patterns of resource use and conceptions of legitimate access (Beinart, 2002a; 2002b both *In:* Dovers, Edgecombe & Guest, 2002; Murombedzi, 2003b *In:* Adams & Mulligan, 2003).

Beginning in the colonial era and continuing into independence natural resources, including wildlife and related habitat were

“incorporated into the public domain of the state, such as national parks and protected areas (e.g., game and forest reserves, hunting blocks), as well as water resources. Here, administration and usage is exclusively in the state’s hands (Kirk & Adokpo-Migan, 1994 *In: Kirk, 1997 In: McCarthy, et al., 1997*), which has led to a well-documented ‘tragedy of the state’ (Baland & Platteau, 1996 *In: Kirk, 1997 In: McCarthy, et al., 1997*) - with resource plundering, only rudimentary management and enforcement capacities, and thus high transaction costs” (Kirk, 1997 *In: McCarthy, et al., 1997*, Excerpted with permission from the International Food Policy Research Institute).

The colonial masters of England, France, Belgium, Portugal and Spain signed the first international conservation treaty in 1900, “The Convention for the Preservation of Animals, Birds and Fish in Africa”. The goal of this treaty was to save African wildlife for hunting by royalty and upper class Europeans, and for ivory. Its objective was to protect the elephant and wildlife from Africans (Bonner, 1993).

“It soon became apparent that nationalization undermined customary tenure regimes without replacing them with comparably effective systems of state management and administration” (Kirk, 1997 *In: McCarthy, et al., 1997*). Africans had their traditional governance and resource management systems usurped by Western laws. Traditional hunters and resource exploiters were turned into poachers (Crush, 1980 *In: Fabricius, et al., 2001*) and alienated from these imposed management systems.

The degradation of wildlife and its habitat was used by colonial officials to justify conservation. In the case of wildlife this meant the creation of parks and

protected areas given over to government game wardens and “Great White Hunters”, while in forestry, this justified the transfer of user rights from local communities to extractive firms. In almost all cases, wildlife conservation meant the expulsion of Africans from territory to be preserved and the almost complete extinction of African user-rights to the resources. Colonization of the South (e.g., tropics) by European powers in the 18th and 19th centuries and the accompanying spread of conservation did not bring with it this respect for traditional rights (Colchester, 1994 *In: Roe, et al.*, 2000).

The concept of modern day parks had a lot to do with John Muir, founder of the Sierra Club in America (see Section, 3.12.3, Beginning of the Green Movement) although this is an Anglo-Norman concept dating back many hundreds of years (see Section, 3.4.2, Origin of Parks and Game Reserves). The model for wildlife conservation that was globally adopted was based on the American approach with local people's traditional rights of use and access classed as poaching and encroachment (Colchester, 1994 *In: Roe, et al.*, 2000).

3.4.1.1 Cape Colony, South Africa – some of the earliest legislation

Being the main land base for European expansion in Southern Africa and settled since the mid-1600s, the Cape Colony was one of the first places in Africa to experience wildlife depletion from over-hunting and the expansion of civilization – Europeans and their agrarian systems. By 1822, the Cape Colony had enacted sophisticated hunting restrictions including: 1) closed seasons, 2) special protection for elephant, hippopotamus and bontebok, 3) restrictions on killing pregnant and immature animals, 4) stringent anti-trespassing provisions, and 4) embryonic state game reserves (Carruthers, 1995).

The Game Law Amendment of 1891 and the Game Preservation Ordinance Act of 1899 brought about the end of frontier exploitation by adventurers like ivory hunters in Southern Africa (Bond, *et al.*, 2004 *In: Child*, 2004a; Murombedzi, 2003a). Though passed in the Cape of Good Hope (a British colony), the game legislation was imposed on the British South African Company (BSAC) in its charter by the imperial state. Thus the game laws would be applied to the (BSACs) territory, later (in 1923) to become Northern Rhodesia, Southern Rhodesia and Nyasaland.³⁰ “The ordinance further declared elephant, giraffe, hippopotamus, white rhino, eland, zebra, Burchell's zebra, quagga, kudu or ostrich royal game and prohibited their killing, hunting pursuit or capture, unless they were bona fide required for scientific or farming purposes” (Murombedzi, 2003a). A closed season was established linked to breeding (October 30th-April 30th). Hunting required the purchase of game licenses; “A” for general hunting during an established season, while game on a “B” license required special permission before hunting (royal game such as elephant). Certain wildlife controls were allowed as a means of regulating disease linked to game and predators. A species could be protected from hunting for a period of up to five years in order to allow its population to rebuild. People traveling through the area, such as farmers and police, were exempt from the ordinance and allowed to hunt game to feed themselves if they were 20 miles or more from a town. However, the meat could not be brought to town and sold commercially. This also made it easier for farmers to undertake vermin/disease control. The taking of game by policemen was considered excellent training for military/war (Murombedzi, 2003a). Many of these laws were poorly enforced (MacKenzie, 1997).

³⁰ The BSAC charter was granted to John Cecil Rhodes in 1889. The BSAC handed over its territory to Britain in 1923. In 1953, the Federation of Rhodesia (North and South) and Nyasaland was created. This did not include Bechuanaland (Botswana) or the *Zuid-Afrikaanse Republiek* (Transvaal) or Orange Free State.

3.4.1.2 Centralization of control over wildlife, South African Republic

With the creation of the semi-unified Transvaal, consisting of five autonomous republics that became unified in 1853, concern was already beginning to take hold that the resource driving the economy, wildlife was rapidly being depleted like a seam of gold being played out. In 1846, the Volksraad (parliament) of the Andries Ohrigstad district passed a resolution exhorting *burghers* (citizens) not to kill more wildlife than one could use at any one time (Carruthers, 1995). By 1858, the wildlife economy of the Old Transvaal had begun to suffer from the depletion of game, resulting in the passage of the first hunting legislation in the *Zuid-Afrikaansche Republiek* (South African Republic). Its objectives were: 1) sustainable use of wildlife as a means of perpetuating economic welfare and security of the state, 2) as wildlife was becoming less abundant, to start controlling and restricting African access to wildlife and firearms unless under the control of a white, 3) reducing the African communities' ability to live from wildlife as a means of forcing them to become laborers on white-owned farms and mines, and 4) disarming "bands" of Africans who could have posed a military threat to the nascent Transvaal Boers. The law failed at the time due to the white's dependence on wildlife and the hunting power of their black colleagues (Carruthers, 1995), but it was ominous of things to come as sedentarized farming, urbanization and industrialization took over from the semi-nomadic lifestyle of the market hunter - similar to the buffalo hunters and beaver trappers (mountain men) in North America - who had opened up and provided access to the "Wild West" of Southern Africa – the Old Transvaal – which would become the gateway for European hegemony over the rest of the region.

By the 1860s, the landholding and urbanized elite began to take on "British" attitudes of recreational "sport" hunting that conflicted with those of the black and white market hunters. In 1870, new legislation was passed incorporating the 1858

legislation, in addition to recognizing the need for state gamekeepers to enforce the law, and the need to further restrict traditional black hunters by outlawing trapping. The belief in “hunting for pleasure” as being ethical and hunting for the market as “cruel” was reinforced with the annexation of the Old Transvaal by the British in 1877 (see Ethics, below). Seen as a loophole to conservation, the clause allowing whites to hunt (‘sufficient for one’s own consumption’) was changed against the wishes of the President of the Boer Republic, Paul Kruger, to an annual quota of 15 large head of game and 20 head of small game per hunter (Carruthers, 1995). In fact, Carruthers (1995) depicts Paul Kruger as being anti-preservationist, exuding the utilitarian “biltong” hunter mentality of his pioneering generation, far from being the “Father of National Parks” and the founder of the renowned “Kruger National Park”. This folklore was eventually useful in the late 1940s in creating the political movement of Afrikaner Nationalism. In other words, Kruger was a proponent of conservation (sustainable use as personified by hunting blocks/game reserves) over preservation (protection/no use as personified by parks).

3.4.1.3 Centralization of control over wildlife, Northern Rhodesia (Zambia)

First under the British South African Company (BSAC) in the late 1800s and then as the British colony of Northern Rhodesia in 1924, gaining control over wildlife was central to the plans of Northern Rhodesia’s (Zambia) colonial administrators. Despite the decimation of wildlife populations due to an outbreak of rinderpest, the British were convinced that the major cause for this decline was excessive hunting by Africans with black powder muskets.

The colonial administrators, in this case the British South African Company (BSAC), undermined the authority of the chiefs. The BSAC sought to dominate the lucrative ivory trade in the late 19th and early 20th centuries. The chiefs were

obliged to enforce European regulations, which decreased their popularity among Zambians, who had already witnessed the chiefs' impotence to stop white colonization (Gibson, 1999).

The BSAC struck at the heart of the chiefs' control over wildlife, and the access to wildlife by rural Africans. Africans were not allowed to own guns or powder (Marks, 1984) while areas designated as game reserves were declared off limits to Africans, and hunting restrictions such as quotas, game licenses, etc. were published under the 1925 Game Ordinance. The government assumed complete jurisdiction over all natural resources, and land use.

3.4.1.4 Centralization of control over wildlife, Southern Rhodesia (Zimbabwe)

Government appropriated formal control over all wildlife, providing hunting rights to resident whites and visiting sport hunters. Blacks, through hunting and firearms restrictions, were almost totally excluded from any legal use of wildlife. For communal land farmers, wildlife became a liability except for those who were willing to risk unsanctioned exploitation as "poachers". Even for the white owners of farms and ranches, wildlife was often seen as competition to crops and livestock, and thus eliminated illegally. Parallel to this alienation of wildlife from farmers, the state also created "game reserves" which were to form the basis of the parks and wildlife estate of today, covering 12.5% of the Country's land surface (Murphree, 1997); 14.72% in 2004 (see Chapter 11, Section 11.10.6.3, Few success stories with the 10% factor).

3.4.1.5 Centralization of control over wildlife, East Africa

By 1891, the first hunting regulations were issued in the Moshi District, Tanganyika, six years after it had been declared a protectorate. The first general wildlife ordinance for the then German East Africa dates back to 1896 and was issued by Hermann von Wissmann, the imperial governor, to avoid the extinction of species and to assure future generations “ ‘...the chance to find leisure and recreation in African hunting in future times’ ” (Baldus, 2001). At this time, the Governor announced plans to establish wildlife reserves for controlled hunting. “European settlers and hunters were quite frustrated by their own Government, which only interfered with traditional hunting by the local African population when it was seen as commercial” (Baldus, 2001). Commercial culling viewed as the biggest threat to wildlife, was stopped in 1911, while the concept of “*sustainable use*” or “sustainable offtake of wildlife” was evolving as a term. Hunting licenses could be obtained by indigenous Tanzanians, non-indigenous residents and visiting nonresidents with fees differing accordingly. Landowners could kill problem animals, but skin horns and tusks had to be turned in to government. All predators including lions, leopards, wild dogs or crocodiles were considered pests and could be killed on sight and for reward (Baldus, 2001).

Parker (2004) notes that natives were disallowed from hunting in white dominated Anglophone Africa, namely Kenya, Southern Rhodesia and South Africa (including what is now Namibia) as a security measure to keep firearms out of black hands. Access to firearms and the right to hunt was less rigid in non-white Anglophone Africa, with the majority of elephant in Uganda taken by African license holders and native game licenses being introduced by 1940 in Tanganyika (Tanzania) (Parker, 2004). However according to Majamba (2001), Section 28 of the Game Ordinance of 1940 allowed traditional hunting in Tanganyika for the purpose of acquiring food but without a firearm, and special permits were

required for certain species. It did not take into account hunting for specific species for cultural and traditional rituals. Local hunting tribes, including the WaTindiga, the Bahi and the Wanderobo who lived with wild animals did not require a hunting license under section 12 (ii) of the Fauna Conservation Ordinance.

“The selectivity in having in place legal provisions that permitted some community members to practice their cultural and traditional rituals pertaining to hunting while denying others reflects the application of the ‘divide and rule’ concept. This strategy was constantly applied by colonial administrative regimes to divide local inhabitants in order to ensure their continued control while using their labor to plunder the economies for the benefit of the Metropolis” (Majamba, 2001).

3.4.1.6 Centralization of control over wildlife, French Equatorial Africa/Afrique Équatoriale Française (AEF)

By 1916, the French administration introduced measures to protect big game from over-hunting in Africa. It was recommended that the hunting by *Babingas* (Pygmies) be monitored and that all Africans be prohibited from using guns. The view that the crocodile, leopard, hippo and rhino were pests was later amended to place the rhino and buffalo on the list of protected species. By 1929, AEF began issuing hunting permits. Eventually game was classified under small game (*petite chasse*), medium game (*moyenne chasse*) and big game (*grande chasse*) for sport hunters, plus commercial and native (*indigene*) hunting with the issuance of corresponding permits. Eventually, Africans were forbidden to use fire and poison to hunt and had to purchase a permit allowing the hunting and trapping of all unprotected wildlife. Big game commercial and sport hunting permits and selected native permits allowed hunting of protected big game species including elephant, hippo, forest buffalo, gorillas, bongo and sitatunga in the forest. Africans were allowed to have hunting arms but had to pay annual taxes and, as

noted, were extremely limited in what they could harvest legally. When given permission to hunt valuable species such as elephant for commercial purposes, Africans were taxed one tusk for each elephant harvested. However, it is believed that many Africans, as today, were not fully aware of these laws and/or chose to ignore them. In many cases, the logistics of going to a regional administrative town was just not practical. Finally, as all over Sub-Saharan Africa, French hunting laws usurped the traditional authority of chiefs, hunting guilds and “master (*tuma*) hunters”, who in the past controlled access to the to wildlife at the local level. This created a dual management system, namely a centralized one favoring white administrators, merchants, missionaries and in recent times “experts and technical assistants”. These centralized systems of control lacked the manpower at the local level to enforce their laws, while the traditional management systems that worked well at the local level were marginalized, forcing many Africans into poaching what they felt belonged to them (Giles-Vernick, 2002), thereby creating unmanageable “open access” resources that were mined by all for short-term gains.

3.4.2 Origin of Parks and Game Reserves

The concept of parks and game reserves carried by the European as he invaded the rest of the world dates back to the Normans (Franks) in the seventh century (Gilbert, 1977 *In:* MacKenzie, 1997). The Norman hierarchies and their complexities of forest law were more concerned with sport, class privilege and assertion of royal status than food supply. The king and his delegated officers had sole right of access to the forest with five animals reserved exclusively for their use; hart and hind (red deer), hare, boar and wolf (MacKenzie, 1997). The “chase and park” areas of unenclosed and closed land were preserves of the Norman lords who held the franchises for the hunting of buck and doe (fallow deer), fox, martin and roe (MacKenzie, 1997). It is interesting that the proletariat, upon the

fall of the Bastille, turned the wildlife back to the people – something that is written and mentioned even to this day in French game laws.

Meanwhile, the poor, the starving and landless peasants who were pouring out of an over-populated Europe into Africa and the New World, among others, imposed the very same laws, which had oppressed them on the indigenous peoples of these lands, which for the most part are still the laws of the land in most of Africa in the 21st century. They took away or greatly restricted the right to hunt and created “Norman/Sherwood Forests” in Africa and the USA and in many other places where they settled, disenfranchising the indigenous peoples and turning parks, game reserves and associated wildlife into resources available to the elite of the colonies, and which the African then and now must still access clandestinely. What had been rejected by “Robin Hood and his Merry Men” in Europe was expected to be accepted by Africans!

“As alarm about the decline of animals increased in the 1890s and the early years of this century, European hunters produced an apocalyptic vision which often produced equally apocalyptic solutions: the creation of vast reserves and national parks, the movement of peoples (out of parks and reserves), widespread culling of both domestic and wild animals, particularly so-called vermin, and the imposition of hunting bans (on Africans) that were highly culturally determined. Ultimately, many of these policies were as disastrous, to the interests of both humans and animals, as the problems they were designed to overcome” (MacKenzie, 1997 *In: Griffiths & Robin, 1997*).

Carruthers (1995) comes to similar conclusions regarding the application of these policies in South Africa. The African was blamed for the demise of wildlife, even though much had to do with the indiscriminate slaughter of wildlife for profit by the Europeans, and so the cure was imposed on Africans, separating them from the very resources on which they depended for survival and cultural purposes.

Parker and Amin (1983) best express these origins:

“The history of conservation in East Africa (Uganda, Kenya and Tanzania) over the past 90 years is a ‘bastard product of a union between one thousand years of Anglo-Norman game keeping and 19th century economic imperialism.’ Initially, the economic incentive to preserve game was directly tied to a desire to secure monopolies over ivory trading. The outward form of the laws was English history repeated. Instead of a Royal House and aristocracy enforcing their will on lowly Britons, the East African laws regulated the sport of imperial gentlemen at the expense of the indigenous people”.

3.4.2.1 Creation of parks and game reserves in Africa

“What the sportsman wants is a good trophy almost invariably a male trophy and the getting of that usually satisfies him...The position is not the same with the native hunter. He cares nothing for the species or trophies or sex, nor does he hunt for the fun of the thing” (Hingston, 1931 *In:* Adams, 2003 *In:* Adams & Mulligan, 2003).

In East Africa, many administrators and some settlers belonged to a higher social class than in Southern Africa (e.g., Lord Delemere), coming from the British and German elite/aristocracy and interested in conserving wildlife for “the hunt” which in Europe was reserved for the elite of society (MacKenzie, 1997; Adams, 2003 *In:* Adams & Mulligan, 2003). “Safari hunting” was born in East Africa where wealthy tourists paid dearly to be guided by professional “Great White Hunters;” what MacKenzie (1997) calls the “elite hunt”, as opposed to “traditional hunting” and “commercial hunting”.

“Game reserves” tended to be places for the European and American elites to hunt (MacKenzie, 1997; Carruthers, 1995). Game reserves were established in Kenya in the 1800s for hunting (MacKenzie, 1997 *In:* Griffiths & Robin, 1997). By the

early 1900s, Kenya was divided into three classes or land uses (Anon, 1911 *In: Blankenship, et al.*, 1990):

- Occupied Areas, inhabited by white settlers, who by the game ordinance owned the game on their land, and seen as areas where wildlife would likely disappear;
- Game Reserves³¹, over an absolute sanctum for wildlife; and
- Game Preserves, consisting of Crown Lands, closed districts and native reserves, all for shooting expeditions.

In Kenya, game regulations encouraged sport hunting, contributing a significant portion of the revenue to the protectorate. As early as 1910, the Kenyan Game Department income from licenses was £ 10,000/year (ANON, 1911 *In: Blankenship, et al.*, 1990). Many Africans, such as the Wakamba, were cut off from legally accessing the wildlife that they had traditionally hunted (MacKenzie, 1997). “Sport” hunting really took off after WWII when traveling became more affordable (Blankenship, *et al.*, 1990) and continued until its ban in 1977 in Kenya. It was made famous by novelist hunters such as Ernest Hemingway and Robert Ruark and U.S. President Teddy Roosevelt. In 1966 sport hunters to Kenya spent K£ 864,200 (US\$ 2,333,340) (Clarke & Mitchell, 1968 *In: Blankenship, et al.*, 1990). By 1972, photographic tourism in Kenya’s parks had become one of the top three money earners, bringing in US\$ 71.6 million, though by the late 1980s, it was estimated that wildlife was contributing 50% and Kenya’s beaches the other 50% of revenue from ecotourism (Blankenship, *et al.*, 1990).

³¹ Observe this term (reserve) and the next term (preserve) were either mixed up or the names eventually changed as game reserves became hunting areas over much of the 20th century, including in Tanzania. National parks became sites for preservation. Game reserves in South Africa in the 21st century may or may not be used for sustainable use at the discretion of the province.

In order to conserve wildlife the Government of Tanganyika had by 1911 officially declared 15 protected areas totaling approximately 30,000 km² or 5% of the colony. Some argue that as early as 1896, game reserves had been established north of the Rufiji River (now Selous) and on the west side of Mount Kilimanjaro (Baldus, 2001).

As is seen throughout this book, very little of the money from wildlife went/goes to the rural communities (see Chapter 9) who had co-existed with wildlife up until the arrival of colonialism. Increasing human populations in the 20th century with no concurrent benefits have put Africans in continual conflict with wildlife; many opting for other land uses as a means of survival since wildlife had/has lost its value economically and in many respects culturally.

Some of the oldest game reserves in Africa are the Groenkloof (1822) and Knysna (1856) in the Cape Colony, the Transvaal (now part of KwaZulu-Natal) Pongola Game Reserve (1894) (Carruthers, 1995), and the Tsitsikamma Forests in the Cape declared a game reserve in 1886 (Child, 2004b *In:* Child, 2004a). The Pongola Game Reserve played a strategic role in providing the Boer Republic access to Pongolapoort (port) at the mouth of the Pongola River, so as to allow it to be free of British intelligence and control. Though the strategic (militarily) and political role of this game reserve was more important at the time than “preservation”, it was the first time the Transvaal had set aside land which would exclude the public and disallow hunting (Carruthers, 1995). In essence, one could argue that this was one of South Africa’s first parks or exclusion zones.

In the South African Republic, after rinderpest and the accompanying extermination of wildlife, game reserves were created where vast tracts of government land around townships were declared closed to hunting for five years.

By 1889, the Volksraad gave the President of the Boer Republic authority to establish game reserves by proclamation, though proclaimed reserves did not enjoy the same legal status as statutes passed legislatively and could be repealed at any time. By 1902, the Transvaal decreed that game reserves were for sportsmen, and as antelope populations increased, hunting would contribute to the economy, as those who wanted the privilege of hunting would have to pay for it (Carruthers, 1995). The movement towards creating conservation areas marked a major change from the pioneering market and biltong hunters to one of a landed and urban elite. British culture also began to direct the politics of the emerging South Africa state (Carruthers, 1995).

In the final years of the South African Republic (e.g., before being taken over in 1910 by the British as the Union of South Africa), there was a major shift in thinking from legislation to conserve game countrywide through “sustainable use” towards legislation advocating rigorous preservation in the creation of game reserves. These reserves had the initial impact of removing depleted wildlife resources from the economy (Carruthers, 1995). The Sabi Game Reserve was established in 1898. It was rechristened Kruger Park in 1926, the first national park in Anglophone Africa.

The oldest African park, Albert National Park was established in the Belgian Congo (today's DRC) in 1925 to protect the mountain gorilla (*Gorilla gorilla beringei*). According to MacKenzie (1997), the Belgians took over from the Germans in prodding the English to create parks, which the English believed to be premature in their colonies, especially East Africa. By 1934, several hunting reserves and parks had been established in the Ubangi-Shari and Chad areas of French Equatorial Africa/*Afrique Équatoriale Française* (AEF) (Giles-Vernick, 2002). In Kenya, Lord Delamere was the first to push for the establishment of parks in 1900. In 1940, the first park was created in East Africa when the

Serengeti was upgraded from a reserve (where hunting could take place) to a national park (Bonner, 1993).

The momentum to create “national parks” in British Africa began in 1930, when Britain’s Society for the Preservation of the Fauna of the Empire sent a Major R. W. G. Hingston to look at wildlife conservation in Britain’s Central Africa colonies of Northern Rhodesia (Zambia), Nyasaland (Malawi), Tanganyika (Tanzania), Kenya and Uganda. He advanced ethical and moral as opposed to utilitarian motives for the formation of parks based upon a dual objective: 1) preserving nature and 2) doing so while not inconveniencing man. This could be accomplished by separating man from wildlife that is by establishing national parks, which excluded local people from living within the boundaries of the park. Hunting would be prohibited. Hingston believed the white rhino, gorilla, nyala and Grevy’s zebra to be on the verge of extinction, projecting their disappearance in 50 years without protection. The main causes were alleged to be: 1) cultivation, 2) trade, 3) hunting (exonerating the European while blaming the African) and 4) the menace of disease. Hingston believed there would be “‘no permanent solution’ ” to problems of crop and stock, of disease and the hunting instinct, until “‘the human life and the wild life are separated into two completely distinct compartments’ ” (MacKenzie, 1997).

In 1933, an International Conference for the Protection of Flora and Fauna of Africa, held in London, laid down the principles on which national parks were to be established, being defined under Article 2 as an area:

1. Placed under public control. The boundaries of which shall not be altered or any portion [thereof] be capable of alienation except by the competent legislative authority;

2. Set aside for the propagation, protection and preservation of wild animal life and wild vegetation, and for the preservation of objects of aesthetic, geological, pre-historical, archeological or other scientific interest for the benefit, advantage, and enjoyment of the general public; and
3. In which the hunting, killing or capturing of fauna and the destruction or collection of flora is prohibited except by or under the direction or control of the park authorities; thus “preservation” as opposed to “sustainable use” and “conservation”.

Human populations were moved off of and denied access to their traditional hunting grounds, burial sites, sacred forests, etc. This resulted in further alienation of Africans from these Western management systems, forcing them into clandestine parallel black markets and making it difficult if not impossible for colonial and then post-independence governments to sustainably manage resources in these parks.

For instance, in Northern Rhodesia (Zambia), vast tracts of land were declared protected areas. By 1959, 43% of Northern Rhodesia had come under some wildlife restriction: 1) the Kafue National Park, covering 22,403 km² (8,650 mi²), was created, 2) game reserves, where no hunting was allowed except by special license, covered 26,107 km² (10,080 mi²) and 3) Controlled Hunting Areas (CHAs), requiring a license, accounted for 273,322 km² (105,530 mi²). As all over Africa, entire villages were moved in creating these protected areas, alienating rural communities who saw these protected areas as exclusion zones benefiting only the white man and colonial governments (Gibson, 1999).

“Thus the establishment of reserves and national parks did not mark a reversal in shooting policies of the past, but the final working out of the tripartite division of land use; whites, blacks and game. If reserves had been the brain child of a hunting elite, identified with the imperial right, national parks were the

inspiration of the new (urban) environmental lobbyists, the forerunners of the Greens" (MacKenzie, 1997).

Parks and game reserves were “white inventions, which elevated wildlife above humanity, which served as instruments of dispossession and subjugation” in which Africans were non-partners who were neither able to continue their traditional subsistence lifestyles in conserved areas, nor were fully co-opted into the system of Western conservation imposed on them (Carruthers, 1995). Put another way, in Africa wildlife and conservation are supplied by poor countries, with opportunity costs borne by poor people (e.g., loss of access to natural resources in agriculturally marginal areas with few livelihood alternatives), and the benefits primarily enjoyed in wealthy countries (LWAG/DFID, 2002) (e.g., international tourists, big game hunters, NGOs and researchers). In more recent times, wildlife has come to be seen as a national, regional and international public good (LWAG/DFID, 2002) with minimal accommodation for the rural people who bear the burden and costs of living with wildlife and who have given up their lands for the “greater good of mankind”! Even in 2004, the average African will never see the inside of a park since you need a vehicle to enter, as traveling on foot is usually illegal. The average African has no access to motorized transportation, and he/she cannot afford the entrance fee, let alone the lodge fees needed to spend time in the park. Even Nairobi National Park, next door to a major metropolis can be considered an outdoor “zoo” mostly visited by whites. A recent analysis of the Kruger National Park in 2003/2004 indicates that only 10% of the visitors are black (Lowry, *pers. comm.*), and compared to the rest of Sub-Saharan Africa this should be considered high. Likewise, few if any Africans can afford the costs of hunting legally in safari areas, which are even more expensive and elitist than parks, relying on low volume high paying clientele.

But Africans did/do enter these areas, clandestinely as poachers, as common criminals, often on the very lands of their ancestors, often accessing the resources

they need for survival and in carrying out the cultural rituals that keep them in contact with their ancestors, the spirit world and more and more to generate a cash income from harvesting what they consider “their” natural resources that have been confiscated from them. Most Africans are alienated from game departments and their staff, though there are innovative programs under development, which will be discussed in forthcoming Chapter 9, attempting to overcome the hurdles and gaps between governments and their constituencies in rural Africa.

3.4.2.2 Creation of game and park departments

The imposition of European laws (e.g., open and closed hunting seasons, bag limits and limitations on the taking of mostly males of the species, minimum trophy size, where hunting could take place, minimum calibers for various categories of game, remaining in one’s vehicle except within the confines of camp while in parks, Problem Animal Control (PAC) and game population control, etc.), revenue collection and the disenfranchisement and separation of Africans from their wildlife resources, required rangers, game and park wardens to administer and enforce these laws.

The early history of most African parks is one of former military officers employing what was successful in combat, waging a war in what they perceived as a battle to save the animals from the surrounding residents. Is it any wonder that rural communities have little regard for classical parks and protected areas (DeGeorges, 1992) and their paramilitary forces (Fabricius, *et al.*, 2001)? Is it any wonder that in rural Africa, someone in uniform is usually seen as the enemy?

Creation of Game Department, Northern Rhodesia (Zambia)

In 1942, the Department of Game and Tsetse Control was established. The Game Department staff supplanted the chief in rural areas. Game scouts became

responsible for local access to game. Initially, their major roles were: Problem Animal Control (PAC) to protect cropland, control of animal diseases, and preservation of game “to the benefit and enjoyment of the public”, meaning whites, in national parks. In the early 1960s, the Fauna Conservation Ordinance gave incredible powers to central government. The governor could declare game reserves, Game Management Areas (GMAs) or Controlled Hunting Areas (CHAs). The minister could authorize individuals to hunt even in contravention of promulgated hunting regulations. The director of the Game Department could prohibit or control the number, species and gender of hunted game through the licensing system. Traditional hunting methods such as pitfalls, snares, poisons, bushfires, spears and nets were outlawed. All trade in “bushmeat” was prohibited, except for local barter between Africans or legally procured game meat (Gibson, 1999).

3.4.2.3 The legal exclusion of the African hunter from his wildlife

Thus subsistence (traditional) hunting had been displaced by elite “sport hunting” with codes (MacKenzie, 1997; Adams, 2003 *In: Adams & Mulligan, 2003*) of fair chase tending to be British in origin. There was no place for the traditional hunter who had become a poacher and whose methods (bow and arrow often poisoned, snares and game pits) of procuring wildlife were considered “*unsporting, unethical and inhumane*”. “The mentality of Georgian England, when under the ‘Black Act’ poachers were transported to penal colonies or hanged was recreated in Africa. African landscapes were conceptually (and sometimes physically) cleared of peasants as unthinkingly as any village moved to enhance the picturesque landscape of an English stately home...African hunters except when reformed as game scouts” (Adams, 2003 *In: Adams & Mulligan, 2003*) or as trackers and gun bearers by professional hunters were *verboten* (forbidden).

Loss of Hunting Rights, Northern Rhodesia (Zambia)

Wildlife was valuable to Africans, and central to their livelihoods, even though forbidden by colonial laws. They continued to kill protected species, fish and hunt in game reserves, and use traditional hunting techniques. Conflict between Game Department staff and rural residents was continuous and sometimes lethal (Gibson, 1999). As an “*Open Access Resource*” belonging to the state, the rural resident’s attitude was that wildlife was either meat “*nyama*” or a crop pest, and if he did not kill it, the next man would. Rural Africans were so irritated by the colonial restrictions to access over wildlife that African nationalists were able to use this as propaganda against European rule on the Continent. Restrictions placed on hunting bred contempt for colonial administrations (Gibson, 1999; McNeill, 2002 *In:* Dovers, *et al.*, 2002). Kenneth Kaunda used the freedom by rural Africans to hunt and fish without restrictions as a rallying call for the independence movement (Marks, 1984). Unfortunately, with independence, these hunting and fishing restrictions were kept in place in Zambia (see Chapter 9, Section, 9.6.1.1, Zambia) and most of Sub-Saharan Africa.

Loss of Hunting and Territorial Rights by “San” Bushmen, Botswana

In 2003, numbering about

“100,000 in Angola, Botswana, Namibia, South Africa, Zambia, and Zimbabwe, the San present a wide spectrum of social, economic and political conditions. Some continue to hunt and gather part time, while most others work for low wages on the farms of blacks or whites in southern Africa” (Hitchcock, Biesle & Lee, 2003).

The history of the Bushmen, among the most marginalized minorities in Africa, has in the main been one of extermination, expulsion, and racial absorption. They

were hunted down and sometimes killed for such actions as stock theft; and they were incorporated into the settler production systems as cheap landless labor (Gall, 2001; Hitchcock, 2003b). Since colonial times and also under the various independent governments in the region (Botswana, Namibia, South Africa, Angola, Zambia and Zimbabwe) the hunting and gathering rights of the San were reduced step by step, dispossessing them of their most important food sources and cultural heritage (Thoma, 2002).

In Botswana, when it was declared a Protectorate in 1895 as Bechuanaland, all residents retained hunting rights on tribal land with permission of the chief. Traditional leaders and eventually colonial governments gradually removed hunting rights from local people through the imposition of hunting regulations. Since the San had no chief, they had no say in public policy. By 1935 in the Ghanzi District, San were subject to prosecution under existing wildlife legislation (Hitchcock, 2001).

Following the placement of deep boreholes, which made communal lands available year round for the grazing of Tswana herds (Cullis & Watson, 2005), the 1968 Tribal Land Act of Botswana defined land rights and use in agro-pastoral terms at the expense of the San/Basarwa hunters and gatherers. The Botswana Tribal Grazing and Land Policy (TGLP) of 1975 aggravated over-grazing and promoted the expansion of livestock into communal areas (see Chapter 6, Section 6.1.4.3, Impacts on pastoralism and range ecology from boreholes) (Smith, 1992). It was based on the assumption that communal areas were over-grazed as a result of the “tragedy of the commons” rather than from private ownership, and that many of these communal lands were unused, even though much of this belonged to Basarwa hunter gatherers. The TGLP set aside the following areas (Cullis & Watson, 2005):

- Commercial land (private individuals or syndicates);
- Communal land (based on the ‘traditional system’, but promoting ‘better management’);
- Reserved areas (unallocated land ‘set aside for the future as safeguards for the poorer members of the population’); and
- Wildlife Management Areas (WMAs) (domestic stock permitted but wildlife is the primary form of land use). Added at later date.

“Mechanisms designed to protect the poor (such as the Reserved Areas, limitations on the number of ranches owned by an individual, enforcement of stocking rates by the Land Boards, addressing the issue of dual grazing) failed to be implemented” (Cullis & Watson, 2005). Portions of the communal areas were allocated on 50 year leases as commercial ranches. The National Policy on Agricultural Development (NPAD) of 1991 continued to promote the concept of the “tragedy of the commons” and the fencing of range lands for commercial use (Cullis & Watson, 2005). The dominant Tswana groups gradually took/are taking over the lands of the Basarwa (San/Bushmen), while immigrant Herero from Namibia and Koba from Zambia also used/use their pastoral resources. Under Tswana customary law, digging a well or sinking a borehole gave/gives a person *de facto* though not *de jure* rights over-grazing and water, resulting in many Tswana elites establishing cattle posts around boreholes and hiring Basarwa as second class stock keepers, a form of indentured servitude. The Basarwa would be given 100 head of cattle to herd and although each herder was to receive five cattle from the projected annual increase in the herd of 20% (e.g., 120 cows), carnivore predation would prevent this number from being achieved. The urban elite would then require the Basarwa herdsman to pay back the five lost cattle over the next season, which in essence meant that each year the herder was deeper in debt (Smith, 1992), not dissimilar to modern foreign aid (see Chapters 11 and 12) in which the interest on the “development” loan increases each year putting

African countries into spiraling debt from which they will never escape. Smith (1992) argues that even when the Basarwa obtained livestock, their egalitarian culture of sharing and pressure from the clan to immediately slaughter the livestock for food tended to prevent them from accumulating livestock in any numbers.

Human population growth, deep boreholes in the western Kalahari and eradication of the tsetse fly around the Okavango Delta compounded the problem of invasion by livestock and outsiders in traditional hunter-gatherer/wildlife areas. The 1978 Herbage Preservation Act prevented traditional San practices such as fire to open blocked river channels, control wildlife patterns and improve wildlife feeding. This further marginalized the San/Basarwa. The government created betterment schemes concentrating people into villages called Remote Area Dwellers (RADs) Settlements of up to 750 people/settlement, creating a sedentary situation for nomadic hunter-gatherers. This resulted in a breakdown of traditional cultural and social values, the San escaping through alcoholism, an increase in teenage pregnancies and conflicts between clans (Madzwamuse & Fabricius, 2004 *In:* Fabricius, Koch, Magome & Turner, 2004). Compression of the San into relocation zones would also have placed undue pressure on and likely would have resulted in the unsustainable exploitation of natural resources around such villages. This was exacerbated by the elimination of wildlife migrations and reduction in wildlife numbers as a result of cordon veterinary fences to control foot and mouth disease needed to meet European Union (EU) requirements for beef exports (see Chapter 11, Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana).

By the mid-1970s, anthropologists combined efforts with wildlife biologists in an attempt to guarantee subsistence-hunting rights for San foragers. As one San

explained, the Bantu depend upon cattle and agriculture, and the white man on money.

“Meat is our life. We eat kudu, duiker steenbok and birds every morning. What we really care about are big animals. These are our food and depriving us of meat is depriving us of life and the tradition that God gave us” (Hitchcock, 2001).

In 1979, the free Botswana "special game license" enabled San and other "rural area dwellers" living outside of villages to obtain wild meat for subsistence, income generation and exchange purposes, without fear of being arrested for illegal hunting. Members of Parliament, Wildlife and National Parks personnel, ecological researchers and safari hunters opposed these licenses as being obstructive to game, while ignoring such factors as the Lomé Convention's subsidized beef, which has had a major adverse impact on Botswana's wildlife populations from fencing to control foot and mouth disease, making any adverse impacts from subsistence hunting insignificant by comparison (see Chapter 11, Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana). Slowly, special game licenses were stopped and by 1998 only issued in the Kgalagadi and Ghanzi districts, forcing more and more subsistence hunter and gatherers to become welfare cases dependent on government food relief and cash-for-work projects (Hitchcock, 2002a; 2002b; Hitchcock, *et al.*, 2003). The 1991 Agricultural Policy continued to favor pastoral lifestyles over hunter-gatherers. The 1992 Wildlife Conservation and National Parks Act further reduced San access to traditional territories. For instance, the San were not allowed to gather wild resources in the Moremi Game Reserve. Slowly, the San found themselves compressed into areas that could no longer support traditional lifestyles. Hunting, a central marker of San pride and identity, became criminalized (Madzwamuse & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004). Taylor (2000 *In:* Madzwamuse & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004) found that this did not eliminate

traditional hunting but instead drove it underground, resulting in mismanagement of the resources since the government would have lost control of being able to monitor the offtake to assure its sustainability. This is a common problem when “Open Access Resources” are created. By 2003 in Botswana, the only way that the San could get access to wildlife for subsistence purposes was to establish a Community-Based Organization (CBO) with a constitution and management board and request the Department of Wildlife and National Parks to grant the organization the rights to the wildlife in their area. The granting of wildlife rights does not imply land rights to the community-controlled hunting area. The Botswana government refuses to recognize ancestral land rights forcing San to apply like any other citizen for a piece of land. They must provide water and fencing within two years to keep the land (Hitchcock, *et al.*, 2003). In addition to the fact that most San are too poor to develop land at this rate, this makes it difficult to obtain vast tracts of land for those San who might wish to continue living traditional lifestyles, something that the Botswana government apparently wishes to discourage. Jones (1999) also raises concern over marginalization of San from the loss of special licenses and the creation of Community Management Areas (CMAs) with hunting quotas. Since many Community Management Areas (CMAs) (see Chapter 9, Section 9.6.3.4, Botswana Community Trust Program) and the San living in CMAs are dominated by other ethnic groups, San may still fail to obtain legal traditional hunting rights.

Today, many if not most San of Botswana live in small settlements, earning their living through a combination of foraging, agriculture, livestock raising, small-scale industries (e.g. handicraft sales), and wage labor. A substantial portion of the San live below the Poverty Datum Line (PDL) of less than US\$ 1/day and face difficulties ranging from access to land, social services, employment, and income-generating opportunities to social marginalization (Hitchcock & Biesle, 2002). A major problem facing hunters-gatherers in Africa is that colonial and post-colonial governments passed conservation laws restricting the rights of local

people to hunt (Marks, 1984, Anderson & Grove, 1987; Neumann, 1998; Gibson, 1999; Prins, Grootenhuis & Dolan, 2000 all *In:* Hitchcock, 2001) in addition to declaring sizable portions of African countries as national parks and game reserves which were off-limits to local people. The San and other indigenous people lost over 50,000 km² (Hitchcock, 2001) to parks and reserves in Southern Africa. Over the last decades, there have been some advances such as the ≠Khomani San gaining co-management rights in the Kalahari Gemsbok Park as the result of filing a formal claim under the South African Restitution of Land Act, which was settled out of court (Hitchcock, 2001).

Loss of Hunting Rights in Namibia (Southwest Africa)

In Namibia, the San still retain some but limited hunting rights on what little land they have left, which has been turned into conservancies. Leaving behind a colonial history of more than 150 years, Namibia became a sovereign state in March 1990. In the wake of colonialism, *Apartheid* and a long liberation war, socio-economic conditions for Namibians remain starkly unequal. There is a white, prosperous Namibia and a black, impoverished Namibia. The disparity began with the arrival of European settlers. Namibia's living natural resources, especially its wildlife, were an important source of wealth for the indigenous people. The colonial regimes brought with them the concept of "King's Game", meaning that wildlife once belonging to local people became the property of the State. Under colonial rule, the legal use of Namibia's wildlife was the exclusive privilege of white colonialists. For black communal land inhabitants, wildlife was no longer seen as a resource. Under the Apartheid system, racially-motivated hunting laws and government policies concerning conservation of wildlife and other natural resources made national parks basically off-limits to black Namibians, effectively denying them access to the country's resources and economic opportunities. People living in proclaimed game reserves were made potential criminals if they killed wild game or

collected veld plants for food. Government representatives enforced white ownership laws and, in the process, created hostile relationships with local black residents (USAID, 1992).

Loss of Hunting Rights in South Africa

Surprisingly, the South African Republic's Ordinance 28 of October 1902 treated landowners, both white and black equally, with regard to hunting privileges – for the first time giving Transvaal landowners hunting rights. This implies that non-landowners lost the right to hunt. Land-owning companies based in Johannesburg heavily represented through the Transvaal Game Protection Association (eventually to become the Wildlife Protection Society of South Africa) and the Transvaal Land Owner's Association attacked both subsistence and commercial hunting. As discussed, laws disallowing trapping, hunting with dogs, ownership of firearms, etc. in South Africa had less to do with a concern over the reduction in wildlife as the need to prevent subsistence hunting from possibly creating African independence from the labor market on white-owned farms and mines. The professional Boer hunters were perceived by the landed gentry and urban elite as poor white trash, with legislation being passed to stop commercial mining of this resource in favor of the only acceptable motivation of "sport hunting" by these elite. Thus poor landless blacks and Afrikaners lost their rights to live from wildlife both at subsistence and commercial levels. Meanwhile, these "sportsmen" helped pass legislation to eliminate what was then considered "vermin", including lion, leopard, wild dog, cheetah, hyena, jackal, birds of prey, crocodile and many other reptiles because they: 1) were "evil" endangering human life or livestock, and/or 2) fed on the sport hunters' prey – antelope species which were seen as rapidly dwindling from over-hunting by these predators. Along with vermin, Blacks and poor white trash, needed to be eliminated as a threat to game and sport hunting. In 1926, when Kruger was

declared a park, the killing of lion in the park as vermin was stopped, this species eventually becoming a major tourist attraction (Carruthers, 1995).

In 21st century Sub-Saharan Africa, citizens of Botswana can easily obtain affordable hunting licenses if they are part of the salaried economy, hunting in theory being a constitutional right. While sustainable use is written into South Africa's constitution, the historical past dissuaded the majority from hunting; the cost of hunting is out of reach of the majority and the new gun legislation (SAP, 2000) as being implemented will likely make owning a firearm for hunting nigh impossible for the majority. In other countries, where traditional hunting might be legal, the average citizen is unaware of the law, the cost of a license, though low by Western standards, is often high for people living a subsistence economy. The idea of a hunting license is often resented by people as an imposed requirement by an unrepresentative government and/or the logistical difficulty of obtaining a license (e.g., the capital or regional town) force many to hunt outside of the law. Unfortunately, in most of Africa, though unenforceable, existing laws have changed little since the colonial days, still turning traditional hunters into poachers. Forcing traditional hunters to poach combined with increasing urban demand for "illegal and unregulated" bushmeat makes centralized government management of wildlife resources next to impossible. Legalizing access to and regulating the offtake of wildlife by rural Africans will be critical to the survival of wildlife and its habitat in the 21st century.

3.5 DEVELOPMENT OF HUNTING ETHICS IN AFRICA

The ideals of ethical hunting were only put forth and even considered once wildlife had served its purpose in exploration and the colonial takeover of the African continent had taken place, allowing hunting to play a more ritualistic than utilitarian role in society. As seen below, the same can be said of America.

These ideals included not shooting at a water hole, getting close enough to judge age, sex and quality of trophy, no use of dogs, no shooting of female and young, giving the animal a ‘sporting chance’ to escape, following up and giving the coup de grace to a wounded animal and not shooting from a motorized vehicle (MacKenzie, 1987 *In: MacKenzie, 1997*).

MacKenzie (1997) goes on to say,

“Moreover the true sportsman was a natural historian and a scientist. Killing was in a sense legitimated by his understanding of the quarry, its environment and its anatomy, and his knowledge of firearms and ballistics added an extra scientific dimension. The hunter had become an exclusive club, its rules defined by Western technology and science. The code, though transgressed by many white hunters (still the case with canned lion, spotlighting and shooting from vehicles by so-called sportsmen), from Theodore Roosevelt downwards, served to exclude Africans and Indians. It underpinned game legislation, which attempted to eliminate ‘cruel’ African and Indian (from India) practices. By these means, the club’s rules became national laws”.

However, in many cultures (e.g., German, most Africans) and to many hunters the words “sport hunting” and “sporting” are frowned upon. Yes, like in any sport one must be fit to walk the savannas and forests and climb the mountains pitting one’s body and mind against the challenges of nature; the elements, danger, and for many the spiritual – both good and evil. However, hunting is not a competition. Hunting is a way of life, a reason for being, an experience, but never competition.

Towards the end of the 20th century, the development of “competitive hunting” promoted by international sport hunting clubs that give awards for large trophies or for obtaining a number of animals from a particular category (e.g., Big Five, Spiral-Horned Antelope, etc.) spawned a new breed of hunter, the “collector” as

opposed to the “sport hunter”. The Collector tends to be wealthy, often growing up in a non-hunting environment, or “hunting” on the New York Stock Exchange. He is not steeped in the traditions of “the hunt”. The “collector” sees these awards as another way of showing off his “alpha-male” (not many serious collectors among women, though a few exist) success oriented personality. He places tremendous pressure on his professional hunter, to obtain his trophy at all costs. Ethics in the hunting sense means nothing to the collector, not being part of his upbringing nor of his vocabulary.

The “sport hunter”, and he still exists, hopefully still among the majority, looks for the experience of the hunt and the collection of the best trophy he can obtain. However, he is willing to settle for a representative trophy as a souvenir of that experience if obtained under “fair chase conditions”, that is under conditions in which the game has an acceptable chance of escape as determined by the collective hunting fraternity. Both the “collector” and “sport hunter” still tend to be WASP (White Anglo-Saxon Protestant) reflecting the elitism of their European ancestry, though many are *nouveau riche* as opposed to the old European aristocratic families of a generation ago that dominated the hunting scene. Safaris of 1-2 months have turned into 7-14 day safaris, as a need to get back to the board room in modern society places that much more pressure on the safari operator/professional hunter to ignore ethics. Many hunters are happy to enter into their hunting block, having as little contact as possible with Africans. Ecotourists are not believed to be much different, being shuttled upon arrival at the international airport to luxury lodges hidden inside parks where only wildlife, not people, is to be seen.

Interestingly enough, and for comparison sake, the African Advisory Board (AAB) (2000b), an informal body of stakeholders comprising governments, rural communities, professional and sport hunters, conservation NGOs and

academics/researchers, established in Africa in the mid-1990s, becoming defunct by 2002, developed a similar code to what is discussed above in MacKenzie (1987 *In: MacKenzie, 1997*).

One of the big differences between “British hunting codes” from colonial times and this code is that it recognizes the rights of rural Africans to use and sustainably manage their resources, and allows for modification based on “traditional/customary” hunting practices (e.g., hunting with dogs, crossbows, pitfalls, snares, etc.) if negotiated with the particular stakeholders in a given country or region of a country involved in conservation. Other than that, it clearly reflects the European, especially British origins of the idea of “sport hunting”, an alien concept to Africans other than those who have received a Western education. This code caused a major brouhaha/upheaval among international bow hunters since this code was developed by rifle hunters.

CODE OF ETHICAL SPORT HUNTING CONDUCT FOR AFRICA

- “Hunting to take place on the principles of fair chase, as defined.
- Abide by relevant laws, other legal requirements and recognized codes of conduct.
- Enhance by action, the survival of wildlife populations, protection of biodiversity and the promotion of sustainable utilization.
- Ensure humane practices in the utilization of wildlife.
- Use of correct hunting methods and equipment.
- Engage at all times in fair and honest practices.
- Educate others to the benefits of sustainable use, conservation, correct procedures and the ethics of hunting.
- Recognition of indigenous rural communities needs’ relating to sustainable natural resource utilization.

Every sport hunter shall pursue an animal only by engaging in fair chase of the quarry. Fair chase is defined as pursuit of a free ranging animal or enclosed ranging animal possessed of the natural behavioral inclination to escape from the hunter and be fully free to do so. Said animal is to be hunted without artificial light source, or motorized mode of transport and in an area that does not by its nature concentrate animals for a specific purpose or at a specific time, such as at a waterhole, salt lick or feeding station. No ethical hunter while sport hunting shall take female animals with dependent young. A sport-hunted animal should exist as a naturally interacting individual of a wild sustainable population, located in an area that meets both spatial and temporal requirements of the population of which that individual is a member. Sport hunted animals should, wherever possible, be sustained within an ecologically functional system. The above definition may be modified by the regional hunting associations based upon legal, customary and necessary circumstances that may be unique to each country or area. Accepted and Recommended by the African Advisory Board, 1999” (African Advisory Board, 2000b). Note: This is a minor modification and improvement of a code first developed in November 27, 1997 by the African Advisory Board.³² Prepared by principal author.

³² Key safari operators/professional hunters signing off on the 1997 document include Tony Dyer of the old East African Professional Hunters Association; Gilfrid Powys of Kisima Ranch, Kenya; Bassie Maartens and Volker Grellmann, pioneers of trophy hunting in Namibia – at the time Bassie was also Chairman of the Professional Hunters Association of South Africa (PHASA); Rolf Rohwer, one of the pioneers of hunting in Zambia and at the time hunting in Tanzania; Johan Calitz, one of the major operators in Botswana; Charl Grobbelaar, a professional hunter and chairman of the amateur sport hunting association – Zimbabwe Hunters Association; well known French professional hunter Richard Rouget; well known Southern African professional hunter,

In Southern Africa, many overseas “*sporting*” bow hunters shoot game from blinds placed at waterholes, salt licks, and feeding stations on private fenced game ranches,³³ even placing food at waterholes as an attraction. All these practices are unacceptable to rifle hunters, and make bow hunting less of a challenge instead of more of a challenge that should be the reason for hunting with primitive weapons. The problem lies in the fact that hunting is becoming a business and a means of earning a living that ultimately results in compromising the ideals of what is ethical. Without such aids, a bow hunter would be lucky to obtain one to two animals while walking and stalking over a seven to ten day period. The landowner often makes much of his income on numbers of game harvested, while the reputation of the safari operator/professional hunters depends largely on word-of-mouth praise from the returning “successful” sport hunter to his friends in the U.S. and Europe. Given the expense of getting to Africa and the cost once there (e.g., US\$ 350/dollars/day paid to safari operator), few hunters would return happy with one to two trophies. Thus, ethics is regularly compromised for monetary reasons, creating what some call the “wackem and stackem” mentality.

The afore-mentioned code implicitly does not accept “canned lion hunting” as sporting, that is the raising of lions in pens and then releasing them into fenced

John Oosthuizen; Dieter Ochsenbein, well known sport hunter and head of the Taxidermist Association of South Africa and eventually PHASA; Gerhard Damm, well known sport hunter and first/last president of the Safari Club International (SCI) African Chapter; Humphery Nzimah of the Malawian government; Lance Norris and Skip Donau, today both past SCI international presidents; Rudy Rosen at the time Executive Director of SCI; John Finch, SCI staff member and Andre DeGeorges, at the time manager of the SCI Africa Office. Professor Brian Reilly, Department of Nature Conservation, Tshwane University of Technology, South Africa, contributed significantly to the final version seen above.

³³ A “*game ranch*” implies an area large enough to produce a diversity of free ranging and breeding populations of wildlife, whose annual population growth can be harvested in a variety of ways from trophies, biltong (dried meat), venison, live capture and sale. Many game ranches in South Africa tend to be too small to form economically viable units, being weekend retreats for the rich from Pretoria/Johannesburg. Uneconomically viable game ranches are another reason for the above-noted unethical practices (e.g., put and take), when they are used to earn a livelihood. A “*game farm*” tends to be a smaller area in which high value species tend to be captive bred in a mono-culture system such as ostrich, crocodile, sable, roan, and most recently lion. Often there is a fine line between the two, as lion may be bred in camps and then released on the same ranch into a larger but fenced area, or sold and released into a larger area where they are hunted.

areas just before the hunt, sometimes with the use of drugs to subdue the lion on bait. It does not consider “put and take” hunting as sporting where game is bought at an auction like livestock and shortly thereafter dumped on a ranch and shot by unsuspecting clients thinking they are hunting fair chase game. These are all practices acceptable to “collectors” who don’t care about “fair chase” or in how they obtained their trophy. In many cases, these practices are legal. “Canned lion” do not meet the above ethics requirements of “free ranging animal or enclosed ranging animal possessed of the natural behavioral inclination to escape from the hunter and be fully free to do so”. Nor does it “exist as a naturally interacting individual of a wild sustainable population, located in an area that meets both spatial and temporal requirements of the population of which that individual is a member”. Canned lion are kept in small camps and fed domestic animal carcasses and thus do not meet the criteria of “sustained within an ecologically functional system”. It is likely that “canned lion” hunting may be more dangerous than hunting wild lion, but, there is no “fair chase” that is no “natural behavioral inclination to escape from the hunter and be fully free to do so” as the tendency will be for the lion upon seeing a human to come for him, expecting to be fed and/or to feed on man that the lion no longer fears. Additionally, raising “canned lion” does little to protect wild lion since captive bred lion have never been successfully released into the wild. The future of wild lion seems to be linked to maintaining enough open space from the ever-growing encroachment by man, while at the same time convincing rural Africans that lion and other wildlife have a value in modern times (see Chapter 9 that discusses Community-Based Natural Resource Management [CBNRM]). The majority of sport and professional hunters who developed this code believe that under such conditions (e.g., canned/put and take) trophies should not be allowed into the record books of international sport hunting organizations such as Safari Club International (SCI)³⁴ and Rowland Ward.³⁵

³⁴ Safari Club International, 4800 West Gates Pass Road, Tucson, Arizona 85745-9490

Once again, the need of the landowner to earn a living off otherwise valueless veld is at the base of “canned hunting”. If tomorrow, one was dumped onto a South African ranch and given the opportunity of raising cows worth a few hundred dollars each or lions, prolific breeders that can bring in US\$ 20,000 or more/hunt, the choice would be rather easy, especially with a wife and children to support. There is a market out there consisting of “collectors” who don’t care about fair chase ethics and who just want a stuffed lion in their living room. It is not only lion that are “canned”. Sable, roan, white rhino and even kudu (e.g., 60 inchers) can be bought and dumped on a farm where an overseas hunter may knowingly or unknowingly “kill” such an animal.

The hunting fraternity has determined that this is not hunting but “*killing*”. Lion hunted in Namibia and South Africa were taken out of SCI’s record book in 1997 (SCI, 1997). Lion raised in camps are neither free roaming nor free breeding. Since there have also been fair chase lion taken in these countries, with proof, one can reapply for inclusion of a fair chase lion trophy in the record book.³⁶ The question that must then be asked, is no longer should “canned lion” be considered “*hunting*”, which it is not. Greater society will likely have to determine whether raising and providing “canned lion” to be “killed” is acceptable or not. If it is not, then ostrich and crocodile farming might also be condemned, and then when does it end?

USA, Main Phone: (520) 620-1220, Fax: (520) 622-1205, <http://www.safariclub.org> and conservation/education/humanitarian assistance arm - Safari Club International Foundation, <http://www.safariclfoundation.org>.

³⁵ Rowland Ward, P.O. Box 2079 Houghton 2041, South Africa, Tel: 27-11-728-2542, Fax: 27-11-483-1163, book@rowlandward.com, www.rowlandward.com/index.asp.

³⁶ SCI has put lion entries from Namibia and South Africa back into its latest record book (2006), but separated them out from the rest of Africa (Venter, *pers comm.*), likely from pressure by “collectors”. Linder Venter, Manager/Consultant, SCI South Africa Office, Centurion, South Africa.

Another problem is that many game ranches are too small to be economically self-sufficient. The minimum size varies depending on *veld* type, but on average, those ranches below 2,500 ha are economically unviable since game populations are not large enough to produce an annual sustainable supply of huntable trophy quality game. In attempts to maximize economic returns, small ranches stock up with game from auctions, including non-indigenous species that provides an increased diversity of game to the overseas client and practice “canned hunting”. Prior to the beginning of each season trophy animals are often bought at a game auction, dumped on the farm and then shot off (put and take) by overseas hunters, this process being renewed each year.

Landowners/safari operators and hunters have yet to sit down and reach consensus on the way forward over these issues, for the most part remaining divided. Even among bow and rifle hunters, there is a need for dialogue. By being divided and not speaking with one voice, the hunting community becomes vulnerable to the anti-hunting animal rights movement who would like to see this important Sub-Saharan Africa industry shut down.

Recognizing traditional hunting rights, beginning in 2001/2002 in KwaZulu Natal, South Africa, there has been some opening up to allow controlled hunting of antelope with dogs and clubs by traditional Zulu Hunters.

3.6 THE END OF COLONIALISM AND THE ACCELERATION IN PHYSICAL SEPARATION OF AFRICANS FROM THEIR RESOURCES

Towards the end of colonialism, when European colonizers began to realize that uncontrolled harvesting of game, land clearing, and a doubling/tripling of humans and livestock in the first half of the 20th Century had virtually eliminated “Wild

Africa". Accelerated efforts were made to create parks, game reserves and hunting blocks in order to preserve Africa's mega-fauna.

The final years of colonial rule in East Africa witnessed the extension of conservation policies. The East African Wildlife Association was founded in 1956 (MacKenzie, 1997) to save Africa from the Africans and to encourage the creation of more parks and game reserves, separating "*people and wild non-human nature*" (Adams, 2003 *In:* Adams & Mulligan, 2003). Leakey and Lewin (1996) claim the East African Wildlife Society was founded in 1958 by Louis Leakey. There was no need for "Problem Animal Control (PAC)" but rather "Problem People Control".

Throughout Africa, the New World and Australia, European settlers brought their brand of conservation in which parks and game reserves became large zoos, "Sherwood Forests" for the pleasure of the political elite, but to the disadvantage of the very people whose lives had been integrally linked to wildlife. The lives of indigenous people would forever change as a result of the "surgical" removal of these cultures from their ancestral grounds. The creation of parks and protected areas wiped out entire civilizations relegating them to the margins of mankind.

The American model of "fortress conservation" was implemented wherever the opportunity presented itself. In Uganda, "the clearing of human settlements from areas threatened by sleeping sickness (carried by tsetse flies and therefore common in wildlife areas) presented an opportunity to create protected areas" (Barrow, Gichohi & Infield, 2000). This concept was strengthened by the concept of the "tragedy of the commons", purporting that the common ownership of resources cannot succeed (Harden, 1968 *In:* Boggs, 2000 *In:* Fabricius, 2004 *In:* Fabricius, *et al.*, 2004).³⁷ What this premise ignored, as discussed under Chapter

³⁷ Note in other references Harden is spelled as Hardin

2, is that indigenous peoples in Sub-Saharan Africa and for that matter all over the world had management systems in place that worked and are working, and that were and are (see Chapter 11) being ignored in favor of centralized management systems. Centralized management systems have been the real cause for the “tragedy of the commons” by destroying “Common Property Resources” managed by local communities in favor of creating “Open Access Resources” (see Section 3.7, CREATION OF OPEN ACCESS RESOURCES).

Wildlife was allowed to expand into large areas abandoned by people because of forced removals, which compressed people into small, often unsustainable areas, compounded by the population explosion of the 20th century. This has resulted in over-grazing, desertification, the gross impoverishment and often genocide of rural Africans. Thus, the British colonial government continued the ecological transformation that had begun in the 1890s in East and Southern Africa (Kjekshus, 1977) which favored wildlife over people, and in the creation of Anglo-Norman exclusion zones dating back to the idea of royal forests and game belonging to the crown. Examples include (Kjekshus, 1977):

- The forced removal of 500 people from the Gombe Stream Chimpanzee Sanctuary, just north of Kigoma on the shores of Lake Tanganyika.
- The Mbulu Game Reserve, Tanganyika, containing 10,000 people, their settlements and 1000s of acres of grazing land.
- The Katawi and Sabi River Game Reserves, Tanganyika where the removal of people was required.
- The Budonga Game Reserve by Lake Albert, Uganda, from which people were eventually removed to protect them from tsetse fly and to encourage the proliferation of wildlife over the 12,950 km² (5,000 mi.²) reserve (MacKenzie, 1997).

- The Serengeti Game Reserve, in which the Maasai lost 83% of their former land area.
- The Selous Game Reserve (SGR) from which 40,000 people were moved out.

A medical missionary wrote to the governor of Nyasaland that “ ‘the victims of trypanosomiasis are martyrs to the foolish policy of game protection’ ” (MacKenzie, 1997). Another missionary argued that when he had first entered Nyasaland, Africans had kept the vicinity of their villages clear by destroying game. They were prevented from doing so by the colonial authorities and game laws aimed at allowing hunting only by the colonial settler elite. The realization was only dawning of “ ‘the enormity of what we have done’ ” (MacKenzie, 1997). As in East Africa, reserves had been established in populous districts and ‘the balance of nature had been upset.’ Missionaries began proposing that Africans should be permitted to take up arms and that ‘their ancient hunting rights should be restored’ (MacKenzie, 1997). Of course, this was ignored, along with traditional common property management at the local level, as described in the last chapter.

3.6.1 Separation of Maasai from Ngorongoro Crater

Ngorongoro Crater was a prime Maasai grazing area. When ordered out of the crater in the early 1950s, the Maasai responded as follows, “We told them you better shoot us together with the cows”. On April 21, 1958, twelve Maasai elders signed an agreement to abandon the western Serengeti without knowing what this agreement implied. By 1974, due to the tourism potential and concern over limited water supplies, the Maasai were forced out of the Ngorongoro Crater, though with permits they could enter temporarily with their cattle to procure salt and water. It is now easier for the 150,000 annual tourists with their tremendous

consumption of water to enter the crater than for a Maasai and his cows (Bonner, 1993). Colonial policies continued after independence, driven by Western donor-backed international conservation organizations.

Resident pastoralists in the Ngorongoro Conservation Area (NCA) that includes the crater and the surrounding 8,300 km² (Maliti, 2003) “are assured of rights to habitation, grazing, and access to water and salt. However, the actual accrual of benefits resulting from tourism has been less clear, and has caused an increasing amount of conflict between the resident peoples and the Ngorongoro Conservation Area Authority (NCAA)” (Barrow, *et al.*, 2000).

In the early 1990s, the closest secondary school for the Maasai living along the edge of the crater was a two-day walk. Little or no employment came to the Maasai from tourism, and no money obtained from ecotourism went to the Maasai living in the greater conservation area for development. As Western educated wildlife biologist and author Tepilit Ole Saitoti said, “We are beginning to think that the whites care more about the future of wildlife than the Maasai. We are thinking that maybe we need to eliminate the wildlife if we are to survive” (Saitoti, *pers. comm.*), and this being said by someone with a masters degree in natural resource management and whose ethnic group had co-habited with wildlife for centuries until the coming of the white man. On the other hand, he went on to say, “We are not stupid. Although cattle will always be part of our lives, let us see significant benefits from wildlife and we will destock a percentage of our livestock to favor wildlife” (Saitoti, *pers. comm.*).

The development of a NCA management plan (NCAA, 1995 *In:* Barrow, *et al.*, 2000) is said to be more participatory.

“Continued participation in planning, and agreed rights and responsibilities for all the parties, will be key to the future success of the NCA as a multiple use conservation area. Of particular

concern is how the NCA will handle such issues as integrating livestock and wildlife migration routes, providing support for transhumant pastoral production, land and water rights, supporting community resource tenure arrangements, food security and the sharing of benefits from the NCA. These will be key issues to integrate if the NCA is to remain one of the wonders of the world" (Barrow, *et al.*, 2000).

3.6.2 Forced Removal, Kruger National Park, South Africa

The 19,000 km² Kruger National Park was first established as the Sabi Game Reserve lying between the Sabi and Crocodile Rivers in 1898 (expanding north to the Olifants River in 1903, and eventually adding the Singwitsi Game Reserve) in order to build up game as a result of over-hunting. In 1902 Sabi was a shadow of what it is today with regard to wildlife populations. It had no black rhino, elephant, eland, hartebeest or ostrich, while there were only five giraffe, eight buffalo, 12 sable antelopes, two roan antelopes, five tsessebe, 40 blue wildebeest, 100 waterbuck, 35 kudus, and numerous impalas, steenbok and duikers. The Sabi and Shingwedzi Game Reserves became the Kruger National Park as a result of the 1926 National Parks Act. Interestingly enough, initially scientists, mainly veterinarians, were against the park seeing it as a reservoir for wildlife diseases such as rinderpest, sleeping sickness and foot and mouth that could be transmitted to livestock (Carruthers, 1995).

Kruger's third and longest reigning (1902-1946) warden James Stevenson-Hamilton had a major influence in South Africa's thinking towards the "*preservation*" philosophy of parks and game reserves. He distinguished between a preserve in which hunting was allowed, and sanctuary/state game reserves and national parks in which there would be no hunting. The sanctuary/reserve/park would be managed under the modern concept of non-interventionist "natural regulation" (Carruthers, 1995) following the

“precautionary principle” supported by the Western animal rights movement in the 21st century that allows nature to take its course.

This is as opposed to the eventual pro-active “adaptive management” (including culling) approach of parks in South Africa, which marked the applied scientific management that followed Stevenson-Hamilton’s forced retirement in 1946 at about the age of 80 with the takeover of national parks by highly motivated Afrikaner scientists, which proved to be a form of affirmative action (Carruthers, 1995) (see Chapter 9 for further discussion on the precautionary versus adaptive management principles). The imperialist sport hunter’s “pleasure in random bloodshed” was replaced by “sanitized and efficient killing” by means of darts shot from helicopters (Carruthers, 1995), as parks became the exclusive “hunting grounds” of privileged veterinarians, researchers, and rangers. Had anything really changed or had hunting arrived at the next level of elitism, a new “privileged class” that enjoys, even today, these exclusive rights and the “chase” as much as those elites who had preceded them?

The creation of the Kruger Park, similar to American parks, was based on colonial whites’ acceptance that game viewing and wildlife research were viable land uses (Carruthers, 1995; Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*). Stevenson-Hamilton organized the management of Kruger along para-military principles, breaking the park into sectors controlled by rangers and their African teams to control African residents in their sectors and to arrest poachers (Carruthers, 1995).

In the late 1940s, the Kruger Park became a symbol of Afrikaner nationalism and a playground for white researchers and tourists – the nakedness of *Apartheid* clothed in the fig leaf of conservation (Carruthers, 1995; Carruthers, 1997 *In: Griffiths & Robin, 1997*). In 1900, only 10% of the Afrikaners, descendants of the

Voortrekkers, lived in urban centers. By 1926, 41% lived in urban centers forced out of the rural areas by the capitalization and commercialization of farming to live in slums as mine, rail and factory workers (Swart, 2003 *In:* Beinart & McGregor, 2003). With the beginning of Afrikaner nationalism, the Kruger Park became a major symbol, for the poor, working, urbanized Afrikaner family to escape industrial pollution and materialism, and for the youth to hark back to simpler times when their forefathers, as sons of the soil led a carefree, pastoral life with the veld as their classroom (Bunn, 2003 *In:* Beinart & McGregor, 2003), hunting and living off the land, close to God. The Kruger Park eventually served as a buffer zone against so-called terrorists from Mozambique (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003) during the activities of the liberation movements in the 1980s.

In 1902, at least 3,000 residents were forcibly removed from what was to become the Kruger National Park (Carruthers, 1997 *In:* Griffiths & Robin, 1997). The Kruger Park headquarters and most famous rest camp at “Skukuza” is the nickname given to Stevenson-Hamilton by the evicted Tsonga tribesmen, meaning “he who sweeps clean”. This is a name still given to the entire park by many South Africans (Fabricius, *et al.*, 2001). Stevenson-Hamilton (1937), speaking of the 1902 era, states “the Reserve has been cleared of the natives, who had been moved north of the Sabi and south of the Crocodile Rivers”. However, not all blacks were excluded. Carruthers (1995) describes how after 1905 many scattered residents were seen as an asset and allowed to remain within the park as a source of three-months/year compulsory labor and rent. At that time, there were still 3,000 residents in the Sabi/Singwitsi Game Reserves of which 400 were dues-paying tenants. Poaching was minimal except during droughts, where wildlife served as a food safety-net. The threat of losing their land and becoming subservient laborers on white farms appeared to be the major incentive in controlling poaching as opposed to the threat of forced labor, fines or jail time.

Most poaching came from people residing outside the reserve/park, blacks in South Africa south of the Crocodile River or Mozambicans who could legally own firearms. In 1915, out of 520 arrests in the Sabi/Singwitsi Game Reserves (eventual Kruger Park) only 27 were for poaching; in 1916, this amounted to 91 out of 763 convictions and 37 out of 408 in 1918. Even so, the general view of whites was that Africans living within or near parks could not be trusted to take care of wildlife (Carruthers, 1995).

By 1931, there was mounting aggression against Africans and their cattle living within the park and competing with wildlife. On the other hand, the semi-feudal system of a park under white control managing both the African and wildlife appealed to many. The western border remained unfenced in the 1940s against the will of bordering Afrikaner farmers, though this arrangement was favored by the English speakers. The National Parks Board of Trustees argued that the natives were competing against neither the white farmer nor wildlife, growing just enough food to survive and keeping enough cattle as a bride price; they were “raw natives living under the tribal system”, a picturesque remnant of an older system. In 1939, foot and mouth disease required the elimination of all cattle (1,200) in the park and another 14,000 outside in the Crocodile River District. Africans resided in the park until the 1960s, thereby “protecting the Africans from the corrupt forces of modernization” (Bunn, 2003 *In:* Beinart & McGregor, 2003).

While blacks were said to be legally restricted from entering Kruger (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003), Carruthers (1995) depicts a slightly different but possibly more humiliating picture in which blacks were allowed into Kruger Park on an “unequal basis” in terms of accommodation and recreational facilities. In 1932, a rudimentary tented camp called Balule existed for Africans (Carruthers, 1995). It is suspected that the eventual cost of entry, the necessity of having a vehicle and the primitiveness of facilities offered blacks as

opposed to whites (shops, petrol stations, rondavels, toilets, running water, etc.) acted as a social barrier of exclusion every bit as effective as making it illegal for them to enter. It sent black South Africans the appropriate message, “You savage poachers are not welcomed here! Parks and game reserves are for white people who appreciate the aesthetics of nature”!

Forced removal on a large scale was begun by the early 1950s when South African reserves and parks became exclusion zones. They tended to be fenced to keep people out and wildlife in, requiring pro-active management to control what had become contained game populations surrounded by a hard-edged sea of poverty. In 1969 under Apartheid South Africa, 1,500 members of the Makuleke Community were forcibly removed to expand the Kruger Park northward into “Crook’s Corner” (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*) (see Chapter 9, Section 9.6.3.7, Makuleke Contractual Park, South Africa), once used by elephant poachers to slip back and forth across Zimbabwe, Mozambique and South Africa as a means of avoiding authorities. They were dumped 100 km away, becoming subjugated by a powerful ethnic group, the Mhinga, which resulted in the destruction of their traditional social structures.

The relationship of Kruger’s South African National Parks (SANparks) staff and local communities was adversarial, one of classic “fences and fines” with SANParks officials playing the role of policemen, and locals who entered the park being seen as poachers (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*).

A 1995 land claim restored the “Crook’s Corner”, consisting of 250 km² in the extreme north of the Park to the dispossessed Makuleke Community with the understanding that it be reserved purely for conservation with no residences, mining or agriculture within the boundaries of this property. Though part of

Kruger, the section was de-proclaimed from a national to a “contract national park” for 50 years, allowing the Makuleke to award safari hunting and tourism lodge contracts while under co-management with SANParks. Contract national parks were originally conceived under *Apartheid* South Africa to co-opt powerful white landowners into mutually beneficial agreements, which expanded the park estate without having to purchase additional land. It was not meant for black communities, who could have their land confiscated with no legal recourse; this changed with the end of *Apartheid* in 1994. The co-management agreement is a result of unequal negotiation between relatively disadvantaged community representatives and sophisticated and advantaged officials of SANParks; “chefs with quite different menus, and different powers to cook them”. Co-management has seldom succeeded elsewhere in South Africa (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*). It might be considered a form of “indirect rule”.

SANParks still controls access to wildlife, a major source of conflict with the Makuleke, who preferred consumptive use (e.g., traditional hunting and safari hunting) and, one could argue, a form of neo-colonialism. Youth from the area have been sent off for formal training in tourism hospitality and conservation management, while the sophisticated “white” NGO “Friends of the Makuleke” provides the community with coaching and advice. In 2000 and 2001 respectively, US\$ 80,000 (from two elephant and two buffalo) and US\$ 130,000 were made from a limited offtake of trophy elephant and buffalo for community projects (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*). Safari hunting was stopped in 2004, as the Makuleke have opted for ecotourism lodge development under a contract with Wilderness Safaris (see Chapter 9, Section 9.6.3.7, Makuleke Contractual Park, South Africa). Wilderness Safaris is said to have links to the Vice President of Botswana, Ian Khama, and is openly anti-hunting (see Chapter 9, Section 9.6.3.4, Botswana Community Trust Program).

3.6.3 Forced Removal, Pilane Clan, Pilanesberg National Park,³⁸ South Africa

Creation of the Pilanesberg National Park was the means of legitimizing a “nation”, one of Apartheid’s “independent states”, easing it into international respectability. After having won back their land, originally confiscated by white farmers, the creation of Pilanesberg National Park involved the forced removal of black farmers for the second time. Its creation was opposed by the Pilane clan. This park did not conserve a natural area, but refurbished abused (by both whites and blacks) grazing land, fenced it and restocked it with game. The establishment of the Sun City Casino Resort next door helped Pilanesberg become an international tourist destination. Community benefits included meat from culling and a percentage of the revenue from hunting and photographic safaris. In modern environmental policy circles, national parks are losing ground. National parks and other protected areas were established for colonial elites and today primarily wealthy overseas tourists. This fortress approach has alienated rural people, disenfranchised them, ignored traditional controls over access to these resources, and is resulting in parks and protected areas becoming islands of biodiversity under siege by a wave of humanity (Carruthers, 1997 *In: Griffiths & Robin, 1997*). An interview of peripheral villages around the Pilanesberg Park in 2003 by an official of the Northwest Parks and Tourism Board provides insight into the viewpoint typical of the majority of rural Africans towards parks and protected areas: the Pilanesberg Park is perceived as being for foreigners, rich people and government. The people would like the park to provide them with jobs and scholarships to higher education (Mathebula, *pers. comm.*).

³⁸ Pilanesberg was a national park under the old Bophuthatswana homeland. Today it is a provincial game reserve under the Northwest Parks and Tourism Board used for tourism, hunting and live game sales.

3.7 CREATION OF OPEN ACCESS RESOURCES

The imposition of Western legal systems declared that wildlife belonged to no one and that killing game was not a real crime unlike the theft of livestock, which was private property (Carruthers, 1995). The centralization of control over natural resources, including wildlife, fish and forests, resulted in “common property” managed resources (Chapter 2), becoming unmanageable “Open Access Resources”. Traditional extensive management systems began disappearing. In essence, wildlife belonged to everyone but was the responsibility of no one but the state, which at the beginning had other priorities than worrying about wildlife. When it did, it was generally too under-staffed and under-financed to control an increasingly disenfranchised and alienated majority, rural black communities. This continues in the 21st century under the independent states of Sub-Saharan Africa, which for the most part are still living with the colonial legacy and laws towards wildlife and other natural resources.

The artificial separation of humans and natural resources and anti-poaching policies against the masses in Sub-Saharan Africa were resisted and doomed to failure as they were politically untenable, resulting in national parks (also game reserves and hunting blocks) that were/are constantly compromised by the indigenous people. Subsistence poaching became a form of protest against unfair and unequal wildlife policies that had no legitimacy with the local people. The illegal use of wildlife became the only value that game retained for local people (Carruthers, 1995; Duffy, 2000).

The attitude of rural people towards natural resources of which they had lost control became/is “short-term”, “I better get it while I can, since if I don’t shoot it, snare it, chop it down or hook it someone else will”. Yes, it can be argued that the “live for today” mentality that rural Africans are continually blamed for did

not entirely emanate directly from them, but was as much the result of the pathetic elitist colonial policies imposed upon them.

“The lack of attention to human needs and aspirations, traditional knowledge and management systems has in some cases resulted in increased encroachment and poaching, as well as sabotage to wild habitat (Ghai, 1995;³⁹ Kothari, Singh & Suri, 1995; Kothari, Suri & Singh, 1996 all *In: Roe, et al., 2000*). This trend, in turn, reinforced the (commonly advocated) protectionist argument that local people do not have the knowledge, the will or the training to undertake sustainable wildlife management (IIED, 1994 *In: Roe, et al., 2000*). As human populations continued to grow rapidly, demands on remaining resources increased, leading to increasing environmental degradation and further conflict. ‘Social conflicts have grown in and around many protected areas and conservation goals themselves have frequently been threatened’ (Ghai, 1995 *In: Roe, et al., 2000*)” (*Roe, et al., 2000*).

Enforcement by the state was inadequate, while local controls had been lost. When the European powers substituted their law for local law, they were unaware of how much damage this action would cause.

“Now I know the European should have left you alone. We have set borders where there existed none and have often drawn the limits of your countries with the stroke of a pen, regardless of your race, your breed, your tribe...We wanted European’s law to erase your Black man’s law, and now that we are gone you are deprived of both. Africa, where are we headed” (Tré-Hardy, 1997)?

This disenfranchisement and loss of control over both access and eventually sustainable management happened not only with wildlife but also with fishery (Rajonson, DeGeorges & Booth, 1991; Owino, 1999) and forestry resources (DeGeorges, 1992).

³⁹ Note: Full reference for Ghai, 1995 not given in bibliography of report. Believed to be Ghai, 1992?

3.7.1 Open Access Resources in Niokolo Koba National Park

The Niokolo Koba National Park, Senegal, serves as a fine example of the classical African park established at the end of the colonial era. The Bassari hunter gatherers were thrown out of the park, losing legal access to their villages, traditional hunting grounds, sacred forests and burial grounds. Typical of many end-of-colonial era administrations and until about 1986, the national parks administration was run by “mi colonel”, Andre Dupuy a former foreign legionnaire. His “management philosophy” was “militaristic” consisting of maneuvers that rotated 200 armed guards through the park with M36 rifles to keep the local people out. The Bassari refused to accept the boundaries, considering it a “government and white man’s park”. Every year, confrontations between park personnel and the Bassari resulted in deaths on both sides. When commercial meat and ivory hunters came on camel or horse from Mali and Mauritania, the local people around the park turned their heads and/or aided and abetted the commercial poachers (DeGeorges, 1992). In the 1980s there were only 50 elephants left, while in 2002 there were only about five remaining (Mauvais, 2002).

3.7.2 Open Access Resources, Azna and Toubou Hunters of Niger

The Azna and Toubou of Niger were commercial hunters, which are believed to be excellent examples of how centralized control from colonialism turned wildlife into an “Open Access Resource” permitting ”nomadic hunters” to “mine wildlife” without the local controls of chiefs, elders and hunting guilds, which would have existed in pre-colonial times.

The Azna were specialists in hunting lion with poisoned arrows, using occult forces to render the hunter invisible to the lion, which was shot at 25-30 meters

(Mariko, 1981). Nicolas (1950 *In:* Mariko, 1981) explained how Azna hunters, further south were ruthless commercial hunters. They mounted major expeditions with pack animals and horses to chase game and hunted young animals during the rainy season while following game herds. During winter (December and January), when game concentrated around waterholes, they used fire to drive game towards traps until it was eliminated and then moved on. Mariko (1981) believes the fact that this type of “destructive” hunting was allowed with no controls is one of the primary reasons that so little game is left in Niger.

The Toubou were known as the black nomads of the Sahara, hunting collectively on horse/camel and making use of the javelin or throwing knife, saber and club. They also erected nets across passages, where horsemen accompanied by greyhounds (dogs) drove gazelles, addax and oryx. The feet of the antelope became tangled in the nets and were finished off with lances, hatchets, sabers and javelins. The hunting families ate the organs, but the meat was dried and sold to sedentary populations to the south, especially in Nigeria under the name *Margui*. The skins were sold to local artisans to make handbags, belts, shoes, rugs, cushions, satchels/saddlebags, etc. Mariko (1981) believes that this practice required no specialization as with “professional traditional hunters”, with little courage, skills or other qualities. He believed this to be non-selective hunting resulting in the extermination of males, females, young, etc. and both protected and unprotected species, and considered it a slaughter. Centralized government was unable to control this indiscriminant killing and without traditional local controls, which had been eliminated by colonialism, it was the end of the game! This kind of anarchic commercial poaching is continuing the elimination of wildlife in countries like the nearby Central African Republic as Sub-Saharan Africa enters the 21st century (see Chapter 10, Section 10.3.2.2, 2001, CITES and the ESA will not save wildlife in RCA's savanna areas. Wildlife in a crisis situation, the safari industry cries out but no one listens).

3.7.3 Open Access Resources among the Valley Bisa

In the Luangwa Valley of Zambia live the Bisa, a traditional hunting and agricultural society. The role of lineage, elders and hunting guilds in managing wildlife among the Valley Bisa is described in the previous chapter. Hunting was made illegal for Africans in 1891 (Marks, 1984), but legal for white residents and expatriates. The first game reserves were established in the 20th century as exclusion zones for Africans, leading the Bisa to believe that Europeans were more interested in wildlife than people (Marks, 1976).

By the beginning of the 20th century, the authority of hunting guilds to control access over and manage wildlife waned due to: 1) the introduction of the muzzle loader allowing individual as opposed to cooperative efforts to bring down game, 2) labor migration to work in mines and as domestic servants to Europeans drained the ranks of the guilds, and 3) failed attempts at centralized control over wildlife by the colonial power (Marks, 1976). The disappearance or degeneration of hunting guilds, eroding the authority of the chief and centralized control over wildlife by colonial government, undermined local control over wildlife and other natural resources managed as “Common Property Resources” turning them into centrally controlled “Open Access Resources”.

The exodus of hunting-aged men to urban centers in the first half of the 20th century actually took some pressure off the game and resulted in increasing wildlife populations. Up until the 1960s, hunting was for subsistence purposes, game was abundant around villages and most hunting took place within three km of the village by a few hunters with a muzzleloader, who were sanctioned and controlled by the lineage. Up until the 1960s, Valley Bisa hunters mainly hunted adult males of the four key hunted species; buffalo, impala, warthog and

waterbuck – and thus had little impact on the survival and dynamics of ungulate populations (Marks, 1976).

State regulations were poorly enforced and ineffective. By the mid-1960s, seven game guards (Marks, 1976) were placed in Luangwa Valley to stem the illegal and increasing demand of the “commercial trade” in bushmeat from growing urban centers. This proved ineffective in stopping resident hunters (Marks, 1976). The opening of Luangwa Valley to vehicular traffic and the increasing availability of more effective smokeless powder rifles and shotguns owned by non-lineage members increased hunting success, and the entry of hunters into a moneyed economy, as well as the loss of many traditional controls over access to wildlife and the subsistence level of exploitation (Marks, 1976). Buffalo, zebra (now killed for their skins) numbers, as well as tusk size of harvested elephants, among others, all apparently decreased from increased hunting pressure as a result of the external market economy (Marks, 1984). Half the bushmeat consumed by locals in the Valley was provided by outsiders, diminishing the prestige of traditional hunting guilds and their importance as a pathway to leadership within the community as a wildlife management body, as well as a bond to retain social, economic and political norms within the Bisa society (Marks, 1976). Unregulated and illegal commercial elephant hunting for meat and ivory in the 1970s and 80s resulted in elephant populations in the Luangwa Valley plummeting from 100,000 (Caughley & Goddard, 1975 *In:* African Advisory Board, 2000a) to as low as 15,000 by the mid-1980s (Child & Clayton, 2002).

3.7.4 Open Access Resources, Madagascar

Madagascar has a tradition of environmental conservation, expressed over the centuries as a set of rules establishing natural reserves for religious purposes such as the *ala-fady* or “forbidden forests”. At Aankazomborona Fokotany of

Madagascar, fishing pressure is controlled by *fadys* (closures) on Tuesdays and Thursdays, and certain lakes are reserved for subsistence purposes by a moratorium on commercial fishing. Until the late 19th century, Madagascar enjoyed a balance between population (approximately 2 million people) growth and environment. Low population densities made such traditional practices as *tavy* or “*slash and burn*” agriculture with 20-30 year rotational cycles both economically and environmentally sound. As on the African mainland, given today’s population of about 16 million such, practices as *tavy* are no longer sustainable, and along with uncontrolled burning, are causing a major loss of forest habitat.

When the French colonized Madagascar in the late 19th century, centralized management structures disenfranchised rural resource users and ignored traditional controls and management systems. Many natural areas that were once controlled by specific communities became “open access resource areas” where uncontrolled exploitation led to accelerated environmental degradation.

The situation has now become alarming to the world’s conservation community, since Madagascar houses one of the most biologically diverse plant and animal communities on earth. Approximately, 86% of Madagascar’s plant species, 95% of its reptiles, 65% of its bird species and 93% of its primates are endemic, being found nowhere else in the world.

Much of the island’s biodiversity depends on endemic forest ecosystems, ranging from rainforests in the east to spiny forests in the south and southwest. It is estimated that 80% of Madagascar’s original forest cover has disappeared, or has been severely degraded since the island was first inhabited some 2000 years ago. Between 1950 and 1985, rainforests on Madagascar’s eastern escarpment and benchland declined by 50% from 7.6 to 3.8 million hectares. This amounted to an

average rate of forest clearance of 110,000 ha/year during this period. An average soil loss of 25 tons/hectare/year to 16 times this amount in steep areas of high rainfall occurred from deforestation and poor agricultural practices. By 1985, most of Madagascar's remaining forests were on steep slopes, inaccessibility being the main reason for conservation. If current trends are not reversed, almost all of Madagascar's forests will be damaged or destroyed within 20 years (Development Assistance Corporation, 1993). Over-grazing, especially in the Central Highlands, has contributed to the formation of massive gullies (*lavakas*) and thus to this erosion process (Cox, Rakotondrazafy & Rakotondramazava, 2004).

People are so poor that they have no time to worry about what they consider esoteric ideas such as biodiversity, conservation and environmentalism. When the first USAID multi-disciplinary team arrived in the early 1990s to address the above issues, rural people asked, "Why have you come so far to save lemurs? Lemurs! We eat lemurs". This is a similar response to what many rural Africans give regarding wildlife, seeing it as a human, animal and crop pest, or a short-term resource, i.e. 'nyama' (meat) to eat.

3.8 LAND COMPRESSION

Colonial mono-culture economies, the take over of prime land by European settlers, and the creation of parks and protected areas compressed Africans into marginal areas that could not support them and resulted in further land and habitat degradation, which was blamed mostly on Africa's backwardness.

"From the perspective of peoples in Africa, Asia, the Pacific, and what became the Americas, colonization was essentially an Europeanization involving the imposition of European concepts of sovereignty, religion, and civilization. One effect, perhaps the crucial one, was the drastic reduction of indigenous peoples land

bases and their restriction to progressively smaller areas. In the United States, for example, Native Americans had surrendered 2 billion acres (810 million ha) through treaties by 1887, leaving a residual 140 million acres (57 million ha). Another 90 million acres (36 million ha) was lost through the allotment policy that operated to privatize Native American lands until 1934. As a result, today Native Americans retain barely 5% of the United States...The land was defined as *terra nullius* (empty land) and assumed to be without the impediment of indigenous rights. As in Africa, when their lands were lost, indigenous peoples also lost livelihoods, graves and other sacred sites, history -- for history was written on the landscape -- and much of their religions. Europeans and their colonial offshoots offered in return their form of civilization, based on Christianity, individualism, and private property ownership" (Hitchcock, 2003a).

3.8.1 Land Compression among the Last Hunters and Gatherers, Ju/'hoansi of Nyae Nyae, Eastern Bushmanland, Namibia

In 1950, 1,200 Ju/'hoansi were still supporting themselves by hunting and gathering in an area of about 90,650 km² (35,000 mi²) (Weaver & Skyer, 2003) stretching north and south along the Namibia/Botswana border. They were the last independent self-sufficient hunter gatherers in Southern Africa. In Nyae Nyae in the 1950s, the Ju/'hoansi neither recognized nor were subject to any administrative authority beyond the rules and values of their own society (Marshall & Ritchie, 2003). Governmental decisions in South West Africa in 1970 saw 40,000 km² of the Ju/'hoansi's ancestral territory ceded to other groups, the Herero to the south and the Kavango to the north. A portion of the Ju/'hoansi territory was also designated as the Kaudum (!Aodom) Game Reserve. Eventually, the Ju/'hoansi were left with approximately 9,030 km² (Weaver & Skyer, 2003) or only 10% of their original ancestral land. The Ju/'hoansi were encouraged to move to Tjum!kui, (Tsumkwe) where a borehole was drilled in 1960. They were then trained in agriculture while encouraged to continue foraging (Hitchcock, 2003b). Smith (1992) argues that encouraging pastoralism

among the Ju/'hoansi has diminished the contribution of women to society and thus their social status. Cattle and protection against predation has become a man's job. Men and boys are more likely to come in contact with Herero and Tswana herders learning other languages and developing a more outward looking view of the world. Women's fertility rates increase with a higher fat diet from milk, and without birth control, this increases their work load. The net result of the above is greater separation between men and women, and less equality than found in traditional foraging lifestyles.

Residents of Tjum!kui were hired to clear fields and build roads. Some worked in missionaries' homes, and at odd jobs around the settlement. Alcoholism and unemployment became a major problem afflicting their lives, compounded by social disruption from the Bushmen having been used to fight in the liberation wars of Southern Africa. In spite of the fact that the government had stipulated that people in Nyae Nyae could hunt as long as they used traditional weapons and hunting techniques, Ju/'hoansi men were arrested for hunting animals that were not protected under South West African government conservation laws (Hitchcock, 2003b). Alcoholism and social dissolution continues to be a problem (see Chapter 9, Section 9.7.6.4, CBNRM will not create a "middleclass" in rural Africa, Life, Namibia).

3.8.2 Land Compression among the Bisa, Luangwa Valley, Zambia

In an attempt to stop slash and burn agriculture (*chitemene*), in 1906, the colonial government prohibited the pollarding (ring barking) of trees. A policy of concentration, amalgamating villages of 20 huts or less into large villages, disrupted social relationships and likely affected fallow periods and the localized overuse of other resources (e.g., wildlife), placing more pressure locally on the

land. Local people had preferences for small settlements, where the opportunity to become a headman (*mwine muzi*) of a village increased (Marks, 1976).

3.8.3 Land Compression and British Colonial Policy, Tanzania (Tanganyika)

The British took over from the Germans, following WWI. Whereas the German policy in Tanganyika was reclamation; bush clearance and elimination (shooting) of wild animals (MacLean, 1930 *In: Kjekshus, 1977*), the British implemented the “Desart Policy” which took scattered residents and villages and concentrated them into areas believed to have fertile soils and permanent water – similar to the French policy of *regroupement* (see Section 3.1.4.1, Francophone colonial Africa). Bush was cleared for permanent settlement with the aim of 259-people/km² (100-people/mi²), and 1,000 families as a minimal concentration. On paper, it seemed the prospects for success were self-evident as were later schemes of block-farming, village settlement and *Ujama'a* Villages (see Chapter 11, Section 11.8.4, Food Aid and *Ujama'a* Villages in Tanzania).

It “ ‘will make easier the task of changing a disease-ridden and backward horde of savages into a disciplined and prosperous community’ ” (PCAR, 1933 *In: Kjekshus, 1977*).

By 1934, most of the concentration schemes were in the tsetse fly belt of western Tanganyika, west of the Mwanza – Tabora – Mbeya road, mostly in the northern half, today’s Kigoma, Shiunyanga and Kagera Districts and to a lesser degree in the Tabora and Rukwa Districts. Concentrations continued through the 1940s and early 1950s

These concentration schemes failed as nuclei of economic reconstruction. The rotational/fallow system broke down and the only land cultivated was in the

immediate surroundings of the village. Without the rotational and fallow cycle, it is likely that the productivity of this land was drastically reduced in a few short years, while the bush would have encroached to the edge of these concentrations creating habitat for the tsetse fly. It was estimated that 85% of the people lived on 33% of the land of the original scheme, the remainder being abandoned (TNA 30600, *In: Kjekshus, 1977*). A botanist visited 27 sites in western Tanzania and pointed to their deficiencies as economic entities, the absence of cattle, forcing people to rely on shifting cultivation, frequent soil exhaustion and soil erosion (TNA 31351 *In: Kjekshus, 1977*).

Furthermore, the abandonment of vast tracts of land left uncultivated and ungrazed by removing human populations led to the invasion/return of bush, wildlife and tsetse fly (Apted, 1962 *In: Kjekshus, 1977*; MacKenzie, 1997) that ‘*primitive man*’ had controlled.

3.8.4 Land Compression and the Maasai of Kenya and Tanzania

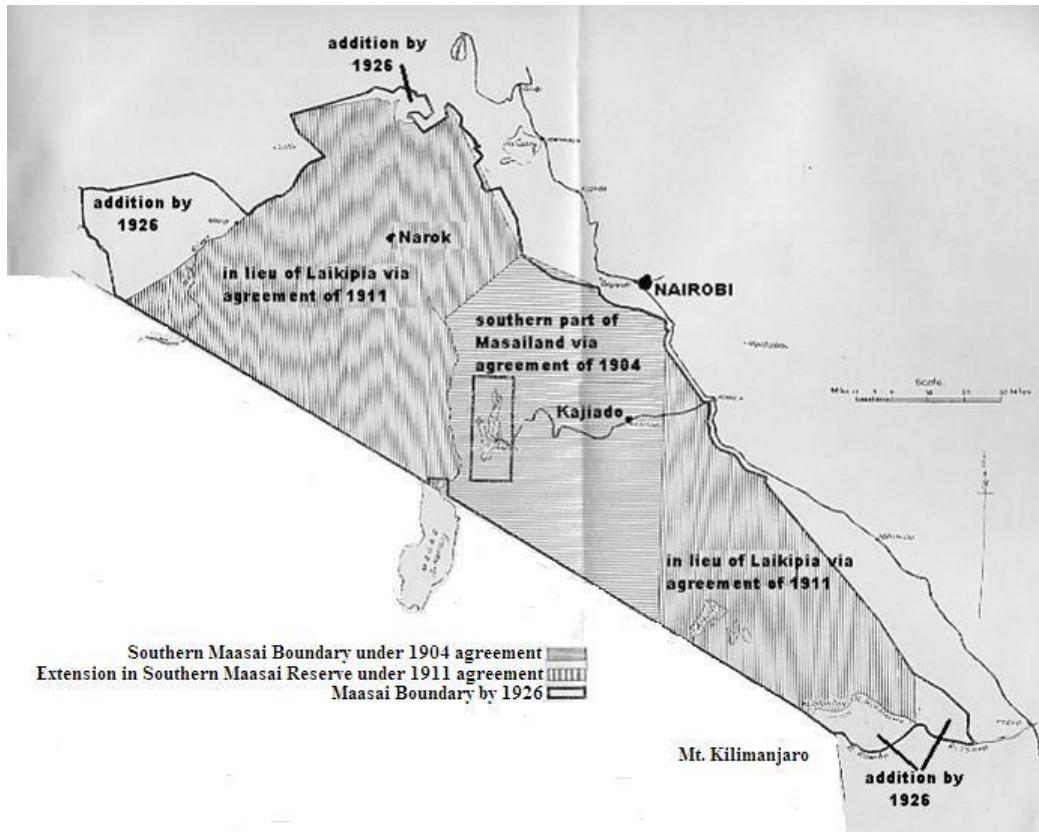
In 1904, the colonial government of Kenya compelled the Maasai to vacate fertile highlands of the Great Rift Valley, giving them other land for compensation, which they were forced to abandon again in 1911 to semi-arid land south of the railway line (Mombassa to Kampala) due to an increase in white settlers (Adams & McShane, 1992; Cheeseman, 2002).

According to Parker (2005a) based upon a review of the Kenya Land Commission report of 1933 and other research:

“Prior to the 1880s, the Maasai were militarily powerful and controlled the plains of highland Kenya (and northern Tanzania). They were divided into clans, the most powerful of which were the Uasin Gishu and the Laikipiak who respectively occupied the Uasin Gishu and Laikipia plateaux. In the c.1870s the Laibonic Batiaan combined

the clans first (warring and defeating) against the Uasin Gishu then the Laikipiak, breaking them totally, leaving only small groups as refugees. In 1883, shortly after the Uasin Gishu and Laikipiak were defeated, an epidemic of bovine pleuro-pneumonia swept through the Maasai herds. Before they recovered from this the Great Rinderpest pandemic swept through the continent and by the time it was over the Maasai had lost most of their cattle. In these circumstances a new civil war broke out led by two of Batiaan's sons – Sendeyu and Ol-Onana. By 1895 it was estimated that there were little over 40,000 Maasai in all of Kenya. In the Land Commission's view, '... but for British Protection, the Maasai would have become a factor of comparatively minor importance and their country might have been gradually occupied by other tribes.' The Government's view was, given their low numbers, that the Maasai had undoubted historical right to live in their lands, but that as a matter of principle it questioned the right of relatively few, wandering nomads to keep others out of more land than they could use. The latter view was given a sharp edge by the Government's simultaneous wish to settle white immigrants.

To make room for European settlement (Parker, 2005a)...the Maasai were persuaded (in 1904) by Government to confine themselves to two reserves: one on the Laikipia Plateau and the other being some 11,136 km² in what is now central Kajiado District (Figure 3.2). Splitting the Maasai in two led to social and administrative difficulties for the people themselves, the administrators and the owners of land between the northern and southern Maasai Reserves. Again, this was added to by Government's desire for yet more land for white immigrants. This led to the proposal that the northern Maasai (largely Purko) should move into a much enlarged single Maasai Reserve in the south. Codified as the Anglo-Maasai Agreement of 1911, the Maasai lost the Laikipia Plateau (to European settlers), and were allocated what is now Narok District and the triangle below the Siria escarpment in Trans-Mara. Subsequently, 2,355 km² in Trans-Mara and 9,550 km² of modern Kajiado District to the east of what had been agreed in 1904, were added: as were other smaller peripheral areas. By 1933 the Maasai Reserve was 37,880 km² in which there were 48,381 people giving a human density of 1.3 Maasai per km². In 1930, the official estimate was that they owned 720,000 cattle, 820,450 sheep and goats and 171,800 donkeys.



Source: Provided by Ian Parker (2005a) with his permission

Figure 3.2: Maasai reserve boundaries, Kenya in 1904, 1911 and 1926

By 1933, when the prospect of alienating more land for white settlement was no longer a possibility, the Land Commission was clearly concerned about the inequitable distribution of land between tribes in Kenya. It gently questioned the sense of setting aside so much land for so few people, and suggested that other people such as the Kikuyu – who were already at densities of $57/\text{km}^2$ – should be allowed into the Maasai Reserve. The British Government stood by its commitment to the Maasai after 1911. However, after Independence in 1963, the reality of the now far greater discrepancies in densities between the Maasai and agricultural neighbours manifest itself. When the white settlers were bought out, the land of which the Maasai had been divested in 1904 and 1911 did not revert to them, but to the Kikuyu, Wakamba, Kalenjin, Luhya and other agriculturalists. With the perspectives of increasing time, it might be argued that given the asymmetry of expansion between agricultural tribes and pastoralists

would have produced the same end effect as the colonial policies. Indeed, they will be seen as a small blip in an inevitable process”.

In Tanganyika, the Maasai were forced to move in the 1940s as white settlers arrived to claim the plains between Mt. Meru and Mt. Kilimanjaro, as well as most of the fertile lands near Ngorongoro (Adams & McShane, 1992).

Following independence in 1961, colonial administrators and African leaders failed to understand how the Maasai fit into their ecological niche, considering these herdsmen a threat to wildlife (Adams & McShane, 1992).

Between the late 1940s and 1970, seven protected areas were created in Maasai areas, further restricting the Maasai people’s range: Nairobi, Amboseli, Tsavo National Parks and the Maasai Mara in Kenya, and Serengeti, Tarangire and Lake Manyara National Parks in Tanzania. Many of these parks/reserves have been managed as isolated islands of game protected from people like the Maasai (Adams & McShane, 1992). The compression of Maasai into smaller and smaller areas bordering these parks has resulted in over-grazing. However, this wildlife is not contained entirely within these reserves, moving out onto rainy season grazing areas belonging to the Maasai. In fact, it is believed that in Kenya, 80% of the wildlife is found or dependent on 80% of the critical wildlife habitat outside parks and reserves (DeGeorges, 1992a; Cheeseman, 2002). The Maasai were so dissatisfied with the loss of Amboseli as a dry season grazing area in 1977 that almost all the rhino were exterminated by them “to show their political dissatisfaction with their prospects” in the park (MacKinnon, MacKinnon, Child & Thorsell, 1986 *In:* Wels, 2000). Between the 1950s and 1977 the rhino population dropped in/around Amboseli from 150 to 15, with many found dead as a result of “revenge killings” from a Maasai spear, often with their horns still in place (Rosenblum & Williamson, 1987) (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between

pastoralists and small farmers, Amboseli and Maasai Mara, Kenya and Chapter 11, Section 11.11.9 Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact On Kenya's Wildlife Outside Parks). This is also true for Tanzanian reserves, where for instance, many species of ungulate from the Tarangire National Park (TNP) move to the Simanjiro Plains of Southern Maasailand during the rainy season to drop their young (see Chapter 9, Section 9.7.8.2 “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”).

To appease the Maasai, the colonial governments constructed dams and drilled boreholes where there were no permanent water supplies. Year round access to water, often in rainy season dispersal areas, along with improved veterinary services led to an increase in the numbers of cattle, goats and sheep, and increasing stress on these semi-arid rangelands (Adams & McShane, 1992), resulting in over-grazing and bush encroachment. Well-intentioned missionaries are continuing this practice, with little understanding for the potential ramifications of over-grazing as they take extensive pastoralists into intensive management systems for which they have no training. These boreholes have also tilted the ratio in favor of water dependent cattle over water independent goats, accelerating bush encroachment as grazers are now favored over browsers (Nyika, *pers. comm.*). More detailed discussions on the impacts of boreholes on traditional pastoralism, wildlife and the environment are discussed in Chapter 6.

3.8.5 Land Compression, Wakamba and the Black Rhino of Machakos Kenya

The arrival of a British administration created new conditions of human settlement that changed the landscape and introduced the transformation of soils and vegetation. British rule protected the Wakamba from Maasai raids. The Wakamba tribe, an agricultural society who hunted, had increased six-fold under

British protection, and land was needed for farming. Fixed boundaries resulted in land compression and along with drought created the barren eroded landscape observed in the 1920s. From 1931-36, severe droughts compounded this problem resulting in degradation due to (McCann, 1999) the:

- Hemming in of the Wakamba herds;
- Encroachment of agriculture on the lower slopes and plains; and
- Effects of drought on vegetation cover.

Colonial policies, with little understanding of local ecology or farming/grazing systems, resulted in the irreversible degradation of the land. Over-grazing combined with the colonial policy forbidding fire, resulted in the loss of savanna and increased bush encroachment and a decline in grazing capacity. Desertification did not occur, but just the opposite, namely bush encroachment. By the 1940s, needing more land, John Hunter, a famous big game hunter, was commissioned by the Machakos District Commissioner, to clear rhinos and other dangerous game out of the area. This would have been the “useless” tsetse fly ridden bush to the southeast, which likely contained poor soils for agriculture, but which was important habitat to wildlife. This area was one of the greatest black rhino areas in the world, John Hunter shooting over 1,000 to clear the way for farming (Hunter, 1952).

The sad thing is that this scheme was eventually abandoned (Holman, 1967). To this day, the majority of Wakamba living in this area on marginal agricultural lands eke out an existence living in abject poverty and relying on donor food aid (Nyika, *pers. comm.*). The only concentration of wildlife in the area today is found on highly successful Wakamba cooperative ranches⁴⁰, which have been

⁴⁰ A “cooperative ranch” is an African owned large-scale ranch generally previously owned by Europeans consisting of up to 2000 members and kept intact and managed as an economically viable unit. Members of the cooperative are the equivalent of shareholders and receive annual

kept intact and have not been subdivided as was done by Kikuyu land buying companies in Laikipia (Powys, 2003). Wildlife on these Machakos cooperative ranches must be continually protected from Wakamba poachers coming across the fences (Stanley, *pers. comm.*).

3.9 ECO-GENOCIDE

Unfortunately, the policy of parks and protected areas has impoverished and destroyed cultures of local people. “

Their (Maasai's) story is about and how Africa's spaces have been set aside for preservation and tourism. Africa may be a vast continent, but the land that has been turned into parks wasn't idle land. Scores of tribes and millions of people have been dispossessed and it is still happening” (Bonner, 1993).

“Foreign aid”, through Western NGOs, government and even African conservationists, is willingly creating exclusion zones in the 21st century that is adversely impacting local cultures. This will be discussed in more detail in chapters 9 and 11, on Community-Based Natural Resource Management (CBNRM) and Foreign Aid, respectively, where case studies are also presented.

In essence, for many indigenous Africans, conservation policies have meant a loss of anchors linked to their cultural and social identities. All over Sub-Saharan Africa one observes incidences of indigenous people kicked out of their traditional world (e.g., even in the 20th and 21st centuries; the San were forced to leave the Central Kalahari Game Reserve (CKGR), the Baka Pygmies expelled from their forests in Southeastern Cameroon, the Maasai were chased off their lands), and all this to create parks, hunting blocks, game reserves and logging

dividends. This is as opposed to a “group ranch”, which is a piece of land set aside for clans living subsistence lifestyles in pastoral areas; the Maasai group ranches of Mukogodo, Kajiado, Amboseli, etc. (Powys, 2003)

concessions. However, once expelled, the people are inadequately prepared to join in the new outside world to which they are exposed, mostly a Western and increasingly a global world in which they are ill prepared to compete, both psychologically and intellectually, lacking an appropriate education. Alcoholism is a major escape, and the situation is generally similar to problems in North America on Indian reservations.

Turnbull (1972) aptly explains the changes which colonialism imparted in destroying the lives of traditional hunting and gathering societies; traditional

"hunters, must have been as much a part of their natural world as the mountains and winds and rains and the very game they hunted and wild fruits they gathered. Wherever they went there was beauty, for as Didigwari (an Ik god) had told them, there would always be enough. But when they became imprisoned in one tiny corner, the world became something cruel and hostile and in their lives cruelty took the place of love".

The same could be said of nomadic herders whose lives have been irreparably damaged by colonial and post-colonial conservation policies.

Interestingly enough, Richard Meinertzhagen, a famous British intelligence officer, who was known for his brutality in subduing the natives, in fact equating humans with game bags (Meinertzhagen, 1957 *In:* MacKenzie, 1997), and Fredrick Jackson, deputy commissioner of the East African Protectorate, were in opposition to Meinertzhagen's relative and Commissioner, Sir Charles Eliot. Eliot favored native reserves as they could provide cheap labor to the European economy, while Jackson and Meinertzhagen disapproved of settlers and believed that the wildlife and the people should be left alone and should be managed in a natural state. Jackson was distrusting of "non-sporting settlers" and was instrumental in creating game conservation policies and a game department (MacKenzie, 1997).

3.9.1 Eco-Genocide and the Elephant People

On April 1, 1948, about 20,898 km² (8,069 mi²) in southeastern Kenya were proclaimed a game sanctuary and called Tsavo National Park. This was considered useless for farming or ranching, largely no-man's land, claimed by no tribe as their territory, a perception that was soon to change. The Waliangulu, Liangulu or, as they call themselves, the Wata were a little known tribe of perhaps a few thousand (Parker & Amin, 1983), less than 5,000 (Parker, 2004) to some say up to 20,000 people (Kassam & Bashuna, 2002), who often adopted the dress and language of their neighbors and became integrated into the societies of the Giriama, Digo, Duruma and Orma (Parker & Amin, 1983). They were divided into clans along the same lines as the Orma and spoke the Cushitic Orma pastoralist language Oromo (Parker, 2004). Parker (2004) leaves some doubt as to whether the militarily organized Orma subjugated the Wata to control the trade in ivory, or whether the Wata were a junior friend in the ivory trade. Inter-marriage between the two groups occurred.

In coastal Kenya, they were also called *Wasanye* stemming from the Bantu word for ironsmith. This skill had been passed on in reverse of typical trends, from a "primitive" hunter gatherer society to more sophisticated agriculturists and herders. Across the entire continent, only the Wata and closely related Boni north of the Tana River, Kenya, specialized in elephant hunting. This is believed to have been due to a climate that allowed appropriate habitat and thus elephant to flourish from southern Somalia to coastal Kenya while providing easy access to trading posts linked to the Mediterranean, Middle Eastern and Indus civilizations. It must not be forgotten that by 500 BC, Asian elephants in Syria and Asia Minor were extinct, making Africa the major source of ivory (Parker, 2004). Parker

(2004) suggests that the Wata were not a primitive hunter gatherer group in the classical sense, but a 2000 year old or older ivory producing culture.

There were about 200 actual elephant hunters among them (Kassam & Bashuna, 2002). The Wata were the “true elephant people of Africa”, specializing in hunting elephant. Other less specialized elephant hunting tribes included the Giriama and Wakamba (Holman, 1967; Parker & Amin, 1983). The Wata hunted with a long bow, measuring nearly six feet with draw weights averaging 100-131 pounds (Parker & Amin, 1983), ranging up to 170 pounds (Parker, 2004). The Wata mostly took spleen (Holman, 1967)/intestine shots (Parker & Amin, 1983), using a very powerful poison called *Hada* provided by the cultivating Giriama tribe, of which the dominant ingredient was extracted (wood, barks, roots and twigs) from the *Muriju* or *Wabayo* bush (*Acokanthera schimperi*). An elephant with a well-placed shot would go no more than 200 meters before dropping (Parker & Amin, 1983 *In:* Kassam & Bashuna, 2002). Parker (2004) estimates that it took about 24 minutes to die from the time the arrow entered, while elsewhere (Parker, 2001 *In:* Parker & Bleazard, 2001) the estimated period is reduced to 15 minutes. Parker argues that this bow/arrow/poison combination was a sophisticated weapon, which modern technology would have a hard time improving upon and that it was maybe more efficient than a modern rifle. Where as a musket ball or bullet has to pass through a vital organ to kill, poison lodged in the blood stream is fatal whether the arrow hits the heel or the brain (Parker & Amin, 1983).

In 1956, the Wata, Wakamba and Giriama were stopped from hunting elephant, which up until then had been their main livelihood in Tsavo National Park. Classified as poachers by the Kenyan colonial laws, they were arrested and placed in jobs with professional hunters as trackers and guides. Some were also employed as game scouts with the Game Department or National Parks. Most,

however, were unemployed, with a risk that they would go back to their old ways if nothing was done about the situation (Holman, 1967). Innovative thinking would be required. Those responsible for ending the hunting life of the Wata were troubled by their fate, and envied their freedom, their knowledge of bush lore and their innate decency. The area where they lived was so dry that farming would only bring a yield once in five years, so this way of life was not practical; thus the birth of the Galana River Management Scheme, or Galana Scheme (Blankenship, *et al.*, 1990), also called the Waliangulu Scheme (Parker, 2004) established in 1958. It was conceived by Noel M. Simon, David L. W. Sheldrick and I. S. C (Ian) Parker (Blankenship, *et al.*, 1990) and Bill Woodley (Parker, 2004). The idea was to use the bush skills of the Wata in a sustainable elephant cropping (form of game cropping)⁴¹ scheme in a 7,770 km² (3,000 mi²) area along the eastern border of the Tsavo Park (Simon, 1962; Parker & Amin, 1983; Parker, 2004). Parker (2004), as a warden in the Kenyan Game Department, unlike many of his colleagues, felt that Africans should be allowed to carry out traditional hunting. The East African Professional Hunters Association opposed the scheme (Parker, 2001 *In: Parker & Bleazard, 2001*).

Between the initial plan in 1958 and its implementation in April 1960, the scheme went conceptually from very hands-off management, in which the Wata would continue their traditional hunting but with rifles instead of bows, while government officials would mainly assure compliance with the elephant quota and marketing of ivory by-products, to a program marked by inflexible bureaucratic controls in which the Wata became closely supervised employees (Parker, 2001 *In: Parker & Bleazard, 2001*). Problems immediately arose, especially the inability of the Wata to adapt to a very rigid militaristic, hierarchical and

⁴¹ Cropping is the sustainable harvest of meat, skins and other by-products from a game population for economic purposes. Culling is reduction of a game population as part of a management strategy. This program appears to be a hybrid of the two definitions. Ultimately, these elephants needed culling to reduce their population, something that never happened.

controlled approach to management, as opposed to an absence of rigid social organization in their own society.

While professional hunters and clients agreed that the revenues from visiting sportsmen should go to the Wata, the Game Department ruled that they would go to the department (Parker & Amin, 1983; Parker, 2001 *In: Parker & Bleazard, 2001*). However, Parker (2004) indicates that income derived from elephant cropping, including meat, hides and horns from all animals could be reinvested back into the project, except revenue from the most valuable resource, ivory, that had to go to the treasury. Parker (2001 *In: Parker & Bleazard, 2001*; Parker, 2004) also states that the ivory was sold separately and after major negotiations returned by the Kenya Treasury to the scheme as a grant.

Since traditional weapons were illegal, the Wata were forced to use rifles, for which they had contempt. They claimed the noise from the rifles drove many elephants into Tsavo, a safe haven, where they remained since no harvesting was allowed in the park. The cropping program assumed the existence of a single elephant population in the Tsavo/Galana Complex, which could be controlled by harvesting outside the park, while it turned out there were a number of herds making the task much more complex. It became clear that the population within Tsavo would have to be solved within Tsavo and not from the outside (Parker & Amin, 1983). The annual quota of 200 elephants was never attained (Parker, 2001 *In: Parker & Bleazard, 2001*).

As a result, the elephant populations exploded in Tsavo, exceeding the carrying capacity of the area to feed them, compounded by bush fires and a drought. By the early 1960s, it was estimated that 40,000 elephant lived in the Tsavo/Galana Complex. Concern existed that the elephant populations were too numerous, opening up the bush and contributing to the death of hundreds of black rhino from

starvation during the 1960/61 drought. Culling schemes to reduce the elephant population in the Tsavo Park recommended by wildlife biologists such as Dr. Richard Laws were rejected by National Parks, because of the National Parks Ordinance, which stated that parks were established to protect wildlife. This was interpreted as meaning no mass-killing programs without fully understanding the consequences (Parker & Amin, 1983). For unknown reasons David L. W. Sheldrick, who first supported elephant reduction reversed his position (Parker, 2004). Today, we would call this the “Precautionary Principle”, as opposed to the Southern African “Adaptive Management Principle”, approach of taking preemptive conservative measures based upon existing knowledge, while monitoring the outcome and filling data gaps to make better decisions, which the biologists and managers were recommending (see Chapter 9 for further discussion on the precautionary versus adaptive management principles). With no active management “natural regulation approach” natural recruitment and elephant compression into smaller areas from increasing human populations, the 1970-71 drought resulted in major elephant die-off in Tsavo (Parker & Amin, 1983; Parker, 2004) as well as a black rhino crash (Parker, 2004).

Two key factors believed to have contributed to this population crash were that 1) the elephants may have reached their carrying capacity and 2) the elephants appear to have been compressed into a region with low rainfall (Owen-Smith, 1992) by both growing human populations and the failed culling attempts outside of the park (Parker & Amin, 1983). To the west of the park, Kamba agricultural expansion displaced elephant into Tsavo. In the early 1950s the Aruba Dam on the Voi River in Tsavo East provided permanent water where none had existed before, resulting in the park becoming dry season range when in the past it had served as wet season range. At the same time, the only natural permanent water in the vicinity, in the Sebaki River far to the east of the Tsavo boundary, became settled by humans at the Rei, Mido and Garbiti waterholes, denying them to

elephants as a dry season feeding grounds (Parker, 2004). Dispersal was not an option for the elephants as various populations of elephants became compressed into the park.

Once the pick-up ivory from the die-off was finished, a wave of poaching began. The estimated loss of elephant in the 1970/71 crash from the drought was 9,000 – 15,000 (Parker & Amin, 1983). The total estimated loss by 1980, which included poaching, was 30,000. This was directly attributable to over-population and mismanagement by foreign interests (Beard & Watson, 1980 *In:* Beard, 1988).

While not showing a monetary profit, the Galana Scheme in its first three and a half years grossed US\$ 108,000 (£40,000) from the sale of 36.5 tons of dried elephant meat sold mainly in Nairobi as biltong (mainly used as dog food); elephant ear and belly skins for leather, and elephant feet for waste-paper baskets and other wildlife curios (Parker, 1964 *In:* Blankenship, *et al.*, 1990). However, Parker (2001 *In:* Parker & Bleazard, 2001) estimated total income from sale of produce of US\$ 58,204 (£21,557) with a net profit of US\$ 21.6 (£8) in the first 3 and a half years of operation if capitol was paid off over 30 years at 5% interest. In other words, the Scheme broke even. The total income increased to over £40,000 over the same time frame if revenue from trophy hunting is included, but which, as noted, was not returned to the scheme.

Meanwhile, the Waliangulu Scheme became the Galana River Game Management Scheme, turning away from being a program to reintegrate the Wata into elephant/wildlife management into a cattle ranching moneymaking scheme (Parker & Amin, 1983; Blankenship, *et al.*, 1990). This was run by Galana Game and Ranching Limited made up of a consortium of American Martin Anderson and Kenyans Mike Prettejohn, Gilfrid Powys and Tony Dyer (Parker, 2001 *In:* Parker & Bleazard, 2001). The company built up to running 28,000 high quality

Boran cattle,⁴² fulfilling all predictions, but eventually had its 30 year lease terminated and ultimately failed since the Galana Scheme lost sight of the original simple goal of allowing the Wata to continue as traditional hunters (Parker, 2001 *In: Parker & Bleazard, 2001*).

Many Wata felt that their being stopped from hunting elephant was to allow the European to take their place through sport hunting (Parker & Amin, 1983). Ultimately, the day the Kenyan government refused the Scheme the right to market and benefit directly from the sale of ivory (e.g. marketed indirectly through Kenya Treasury), was the day the Wata lost faith, being certain the scheme was not to their advantage (Parker, 2004). Sociologically, the Galana Scheme was a failure (Parker & Amin, 1983), a form of eco-genocide that wiped out an entire culture and lifestyle that appeared to be living for thousands of years in balance with Kenya's elephants and other wildlife. Reflecting on the failure of the Galana Scheme, Parker (2004) states,

“how could we as very young white newcomers teach the Wata to live off elephants? With an elephant-dependent culture of great antiquity, surely they should have been the teachers?...The only role that Tony Seth-Smith and I should have played was marketing Wata hunting produce and ensuring that they did not exceed such quotas as may have been allocated to them. Other than this, the Wata should have been left to themselves”.

The tragedy is that in trying to save a wildlife species, they only succeeded in crashing the elephant population, destroying the habitat for other species such as the black rhino, greater and lesser kudu, gerenuk and bushbuck. In Africa today, animal populations are being increasingly confined within limited and unnatural

⁴² Boran cattle are found in southern Ethiopia, northern Kenya and southwestern Somalia. The Boran belongs to the East African Shorthorned Zebu type (see Chapter 1, Section 1.1.4, Origins of Domestic Livestock and Pastoralism in Africa) and is raised primarily for meat production. The Boran is a medium-size *Bos indicus* breed that shows high resistance to heat, ticks, and eye diseases. It can endure scarcity of water and can live on low quality feed (OSU, 2003).

boundaries. Within these boundaries, animal populations tend to increase up to – and then beyond – the limits of the food supply. In a world with finite resources, the elephant is second only to man in its capacity to inflict long-term irreversible damage on its environment. Not surprisingly under such conditions, the elephant is ravaged by many of the same symptoms as modern human: stress, violence, vandalism and heart disease (Laws, 1988 *In: Beard, 1988*). The question that should be asked is this:

“Should this species be allowed to find its own level in relentless competition with others for the world’s limited land and resources, or should the species be brought into balance with the environment and the other species that inhabit it. Today that species is the elephant” (Laws, 1988 *In: Beard, 1988*)

and one could argue the modern human (For further discussion over elephant management issues, see Chapter 10, Section 10.4.5, Does CITES Help Southern African Elephant Conservation?).

The greatest failure was in not trying to understand the traditions, economics and customs of the Wata and their integration into the Galana Scheme.

“Wata hunting was demonstrably the basis for a stable and nutritionally affluent way of life...they were better placed to be teachers than to be taught hunting...Had the original 1909 Game Laws been enforced, permitting their traditions to be followed legally, and had the government assisted them in marketing of game trophies, undoubtedly they could have continued their subsistence hunting for an extended time and earned considerable monetary income without depleting their game stocks” (Blankenship, *et al.*, 1990).

“Long before European ‘game-savers’ arrived on the scene, local hunting tribes such as the Wakamba, Waliangulu and Giriama coexisted with the elephants. It was only when the traditional hunters were rounded up and imprisoned for poaching that the elephant population began to expand and that breeding now

unchecked consumed the limited habitat" (Beard & Watson, 1980
In: Beard, 1988).

The age of the elephant people has passed, and Africa has "lost something special" in this passing, a unique culture virtually unknown to the outside world. Today, the majority of the Wata live on the margins of mainstream society. They eke out a meager existence making charcoal, supplying building poles, serving as watchmen in towns, or merely begging. The few who are better off keep some livestock, farm or engage in trade. They are despised due to their low economic status, and like other hunter-gatherers and former hunter-gatherers, they are subject to negative stereotyping. A Wata sociologist believes that this culture in the 21st century is on the verge of extinction and among other things needs to be recognized as an Oromo sub-group, be given educational opportunities, hunting rights, protection of its sacred shrines and be accorded UN protection as a minority group (Kassam & Bashuna, 2002). For all practical purposes, the Wata might already be considered culturally extinct since they can no longer hunt elephant and their way of life has been erased from the face of mother earth.

3.9.2 Eco-Genocide and the San of the Central Kalahari Game Reserve (CKGR), Botswana

The Central Kalahari has been occupied for hundreds of thousands of years by hunters and gatherers (e.g., G/ui, G//ana, and some Kua San), and since the early part of the first millennium AD by agro-pastoral populations (e.g., Bakgalagadi). The Central Kalahari Game Reserve (CKGR) was established in 1961, prior to independence (1966) to protect resident human populations (including San and Bakgalagadi), wildlife and the unique ecological landscape. It covers 52,347 km² (Hitchcock, 2002a) compared to the 48,000 km² Selous Game Reserve (SGR) that covers 5% of Tanzania's land surface (Baldus & Siege, 2002). At the time of its

creation there were an estimated 4-5,000 people residing in or having access rights to the reserve (Hitchcock, 2002a).

These people were allowed to hunt without licenses as long as they used traditional weapons (Hitchcock & Holm 1993 *In: Colchester*, 1994), such policies being referred to as “enforced primitivism” by the World Bank (Goodland, 1982 *In: Colchester*, 1994). Changes in hunting methods and the increased effectiveness of hunting from horseback, along with livestock grazing in the Central Kalahari, led many ecologists, NGOs and the Department of Wildlife and National Parks to believe that hunting should be stopped by residents of this reserve; the most effective way being to resettle them outside of the reserve. A July 15, 1986 government White Paper on remote area dwellers in the Central Kalahari Game Reserve (CKGR) recommended removing all settlements outside of the reserve. This was met with resistance by the residents, who asked, “*Who will guard the resources when we are gone*”? The Botswana government, against the wishes of Western indigenous rights groups, believed that they had the right to move people from a primitive lifestyle to a more modern one, that wealthy whites were trying to impose a separate development policy, and that the people of the Kalahari were attempting to secede from the nation-state of Botswana (Hitchcock, 2002a).

A “carrot and stick” approach was used to coax people out of the reserve. Cash compensation was promised to those leaving the reserve. Subtle threats were made of decreased government support to schools, health posts and drought relief. A few people were relocated in the late 1980s and early 1990s but many returned to the CKGR because of the limited availability of land and natural resources outside of the reserve. In 1993, the San formed the NGO “First People Of The Kalahari” to fight for their rights to remain in the (CKGR) arguing that the

Botswana Government was being influenced by mining companies, De Beers and Falconbridge (Hitchcock, 2002a).

By April 1997 at a Human Rights Commission meeting in Geneva, the Botswana government held that the Constitution would not let them treat the San (Basarwa) as if they were indistinguishable from wildlife— that is to allow the San to be part of the natural ecosystem. This therefore implied the need for their removal. In spite of protests, in May 1997, the Government of Botswana relocated over 1,100 people to two sites outside the CKGR (Hitchcock, 2001). The wildlife and other resources relative to the population in these relocation settlements were insufficient to permit these communities to sustain themselves, forcing them to become dependent on government welfare. The March 2000 Botswana government, “National Parks and Game Reserves Regulations”, indicated that residents in the CKGR at the time of its establishment could claim hunting rights but had to apply to the Director of Wildlife. This removed decentralized control over traditional hunting in the Central Kalahari and took away “special game licenses” for traditional hunting that in the past were issued by wildlife officers at the district level (Hitchcock, 2001; 2002b).

In November 2001, the Botswana government again forcibly removed the San and Bakgalagadi from the CKGR. Though groups like Survival International have tried to link De Beers to the expulsion of the Bushmen, leading anthropologists, (ANON, *pers. comm.*),⁴³ state that decisions for resettlement were taken as far back as 1986, and reiterated in 1988. The first removals were in 1997, with the balance of the removals in early 2001. Thus, this all took place before the big prospecting license allocation was granted. The instigator of this resettlement was the Ministry of Local Government, and not the Ministry of Mineral Resources and Water Affairs, nor the Ministry of Agriculture. The Department of Wildlife and

⁴³ Names withheld to protect them

National Parks in the Ministry of Commerce and Industry ultimately fought to have the people stay. Debswana (De Beers Botswana) came out and said that they did not want people to be removed, as did the headquarters of De Beers. Diamonds are not believed to be the major reason that the removals took place. If anyone is behind the removals, it is well-educated and rich Botswanans like two ministers who did not want the San, Bakgaladi, and their supporters (like the CKGR coalition and Survival International) telling them what to do. Their behavior was discriminatory and represented payback against opposition by 'uppity' San and Bakgalagadi, as well as organizations working with them that are believed to be at the center of the decision to remove people. In addition, there were those who actually believed that resettlement was key to development.

Colchester (2003) supports allegations by Survival International that most of the traditional Bushmen territory and the CKGR have been carved up into diamond prospecting leases to some of the world's largest mining companies with the support of the private sector arm of the World Bank, the International Finance Corporation and obviously the Botswana government. No names are provided.

In February 2002, another 450 people were loaded in trucks and moved to the resettlement villages of *New! Xade* and Caudate, resulting in less than 70 people left in the Central Kalahari Game Reserve (CKGR). The relocation camps were dysfunctional with few natural resources, and food handouts providing less than 1,700 calories per day (Kalahari Peoples Fund, 2002), less than the 1,840 calories/day minimum determined by the FAO (2000) as an indication of undernourishment. In the camps, the people faced public health/sanitation issues, loss of hunting rights, harassment and sexual assaults on young women (Kalahari Peoples Fund, 2002). Attempts in 2002 to take the matter of residential rights in the CKGR to court were dismissed on a technicality (Hitchcock, 2003c; Hitchcock, *et al.*, 2003). The case was appealed successfully, and now it is likely

that a new legal case will be heard in the High Court of Botswana in early 2004 (Hitchcock, *et al.*, 2003). There is concern that the failure of the San, despite support from human rights organizations and NGO's, to regain control over their land in the CKGR may set a precedent for the loss of land rights for all the San in Botswana (Kalahari Peoples Fund, 2002). In a landmark decision, Botswana's high court ruled December 13, 2006 that the so-called Bushmen of the Kalahari were illegally evicted from their ancestral land and should be allowed to return.

3.9.3 Eco-Genocide and Ik, the Mountain People

The Ik, numbering about 2,000 people, were a hunting and gathering tribe who moved between the border areas of Uganda, Kenya and Sudan (Turnbull, 1972).

In 1958, the Kidepo Game Reserve was proclaimed, covering 500 km² of the remote Karamoja region of (northeastern) Uganda (MacKenzie, 1997).

The Ik became confined to the mountainous area just east of the Kidepo National Park; formerly their major hunting grounds but because of colonial rules designed to preserve animals while humans, in consequence, starved and died. The area they were confined to, between the Kenya/Uganda border and Mount Morungole, had served as a temporary resting place during their nomadic movements, which were clear and precise depending on the time of the year, the rainfall/weather and the movement of game (Turnbull, 1972)

The Ik concept of family/kinship lent itself to the rapid and disastrous changes that took place following the restriction of their movement and hunting activities. The “family” simply ceased to exist. The Ik were forced to abandon hunting and become farmers on unproductive soils, and in trying to survive on a limited resource base lost the cooperativeness necessary for survival among hunter

gatherer cultures. Their mountain villages were far from inhabitable, the food was limited and unpalatable, and the people were unfriendly, uncharitable, and inhospitable. Those positive qualities that modern society values so highly were no longer functional for the Ik. This spelled ruin and disaster, as basic human qualities, which we take for granted in Western society, became superficial luxuries only affordable in times of plenty. There were no toilets in the villages. Society was in ruins and love ceased to exist. Religion was a thing of the past. Sharing was no longer a part of their social fabric, even between man and wife.

Poaching continued in Kidepo Park. A game kill was slaughtered and eaten on the spot in hopes that no one would discover the treasure before it was completely consumed. A person unable to fend for him/herself would die from starvation or disease.

Food was so scarce that three-year olds were thrown out of the hut and joined age groups as a means of survival. The Ik had been reduced to the behavior of a wild animal. For the species to have a chance of survival when good times might come, the population of breeding age must survive. Thus, children became expendable.

Stealing food became an acceptable part of the culture. Children delighted in beating the weak and the old, and stealing their food. Family and marriage as institutions and death as a celebration ceased to play a role in Ik Society. Young girls sold their bodies into prostitution for a bit of food. The Ik became welfare dependent, not wishing to make their meager fields too productive, even letting food rot in the field or be consumed by pests to avoid government/international famine relief from being cut off (Turnbull, 1972)

The destruction of the Ik and above cultures are but small examples that occurred throughout Sub-Saharan Africa, the New World and Australia, where European settlers brought their brand of conservation in which parks and game reserves became large zoos for the pleasure of the global and political elite, but to the disadvantage of the very people whose lives had been integrally linked with the wildlife on these reserves and parks, and whose lives would forever change in the “surgical” removal of these cultures from their ancestral grounds. The creation of Kidepo wiped out an entire civilization, that of the Ik, relegating them to the margins of humankind, turning them into beggars, thieves, prostitutes and malcontents.

Unfortunately, in 2003/4, there are strong indications that the creation of parks and protected areas is still occurring despite the unfavorable impacts on local cultures. The plight of the Baka Pygmies of Southeastern Cameroon will be discussed in Chapter 11 on foreign aid (Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and *Dobi Dobi*, More Parks and Protected Areas).

3.10 REMOVAL OF WILDLIFE AS AN IMPORTANT PROTEIN SOURCE IN AFRICAN DIET'S

Assuming the indigenous people primitive and uncultured, Major Hingston, reflecting the views of the

“white hunter-conservationists of the colonial time believed that ‘Meat is not part of the routine diet of the African native.’ Securing meat by hunting ‘is the stamp of primitiveness’ from which Europeans should lead him by teaching him ‘the meat-secur ing methods which are practiced by more cultured races.’ This would involve a ‘discouragement of native slaughter’ and ‘teaching of the keeping and breeding such as cattle, pigs, goats, sheep, fowl and ducks’ ” (JSPFE, 1930 In: MacKenzie, 1997).

MacKenzie (1997) contends that the destruction of game or its removal to remote game reserves, sometimes cleared of humans to make way for animals, and the denial of hunting rights to Africans had a significant effect not only on indigenous economic and social relations but also on nutrition. The elimination of game by European settlers, and restrictions on African hunting removed an important source of protein and a hedge against starvation. As one Southern Rhodesian, Jason Machiwanyika said in the early 1900s:

“ ‘Europeans took all guns from Africans and refused to let them shoot game. But Europeans shoot game. If an African shoots an animal with a gun, the African is arrested and the gun is confiscated’ ” (Machiwanyika n.d. *In: MacKenzie, 1997*).

In MacKenzie’s (1997) interviews with elderly Zimbabweans in 1973-74, they lamented on the following changes over the last 70 years: 1) land compression in creation of the communal areas and displacement of blacks for white settlement, 2) removal of trees, and 3) disappearance of game.

3.11 INCREASING HUMAN POPULATIONS, HABITAT DEGRADATION, HARD-EDGED PARKS AND PROTECTED AREAS

The introduction of modern medical and veterinary care, without concurrent birth control, resulted in a tremendous population growth rate in the 20th century, still continuing today (see Chapter 5 Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY). Along with land compression, this resulted in increasing land hunger resulting in the Kikuyu “Mau Mau” uprisings in Kenya beginning in 1948, to the politicized land hunger in Zimbabwe of 2000 (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and

wildlife). It also accelerated the degradation of Africa's natural systems, and resulted in the elimination of Africa's wildlife and its habitat over vast areas of the subcontinent. This continues to be a problem at the beginning of the 21st century, as a combination of human population growth and land compression from continual pressure by the West to expand parks and protected areas on the subcontinent is taking place. The process of creating parks and protected areas gives lip service to the needs of rural stakeholders, but with little concrete evidence of actualization on the ground (see Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers).

3.11.1 Population, Kikuyu and the Mau Mau

The problems with small farmers invading critical wildlife habitat around Amboseli and other areas in modern Kenya can be linked to the combination of land compression (European settlers taking land and creation of parks/protected areas), population increases and the introduction of unsustainable agricultural practices by the colonial masters: a problem that existed half a century ago (Hunter & Mannix, 1954; Dumont, 1966). At the beginning of the 21st century, this is a problem throughout much of Sub-Saharan Africa. For additional discussion see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya.

The Mau Mau uprising in 1948 by the Kikuyu was as much about land hunger as independence (Hunter & Mannix, 1954). By the late 1940s, Kenya's population consisted of five million Africans and 97,000 Asian immigrants dominated by 29,000 European settlers. The Kikuyu population had risen from greater than 1.25 million in the mid-1930s to an estimated 1.4 million Kikuyu by 1948 in the

Kiambu, Muranga, Nyeri, Meru and Embu Districts, as well as laborers on white settler farms in the Rift Valley. Official figures are that 12,000 Mau Mau died in combat, though actual figures may be greater than 20,000. From 1952-56, these districts became a police state. At the peak of the emergency more than 70,000 Kikuyu supporters were held in detention camps without trial, while over the entire period of this event at least 150,000 Kikuyu were held in detention camps and 1,090 hanged. Draconian anti-terrorist laws were introduced that suspended human rights, resulted in detention without trial and seizure of property, and imposed the death penalty for a wide range of offences (Anderson, 2005). To some degree, these actions are reminiscent of the United States reaction to the September 11, 2001 terrorist bombing of the World Trade Center.

Between 1903 and 1906 alone, white settlers occupied 24,291 ha (60,000 acres) of Kikuyu land. The most striking difference was the average size of the settler farm in 1905 of 2,227 ha (5,500 acres), while farms of the Kenyan Kikuyu elite were limited to 16.2 ha (40 acres) as a result of land expropriation (Hunter & Mannix, 1954). Population increases resulted in the area assigned to the Kikuyu as a reserve in some sections having 193 people/km² (500/mi²) by the late 1940s/early 1950s (Hunter & Mannix, 1954). For instance in Nyeri South the population had risen from 179 persons/km² (463/mi.²) in 1931 to 209 persons/km² (542/ mi.²) in 1944 with the average landholding decreasing from 3.27 to 2.72 ha (8.09 to 6.71 acres) over this period. By 1955 this figure had declined to 2.11 ha (5.22 acres)/landholding. By 1944, it was estimated that in order to have a decent quality of life, the number of families in South Nyeri would need to be reduced from 29,000 to 15,000, this being typical of the land pressures and compression across Kikuyu land (Anderson, 2005). One of the consequences was the formation of a labor market in the Kikuyu reserves, the settlers having vast amounts of land but little labor and the Africans possessing abundant labor but lacking land (Hunter & Mannix, 1954). This problem was “exacerbated when the process of

individualization of tenure in the reserves in the mid-1950s started with a deliberate aim of completely transforming African communal tenure relations into individualized land holdings" (Lumumba, 2005 *In: ACTS*, 2005). In addition to modern medical care, a key reason for this increase in population was believed to have been the loss of traditional family planning practices, requiring that a woman have no relations with her husband while nursing, a period of about two and one half years (Hunter & Mannix, 1954).

The Kikuyu felt robbed of their land. Therefore, a commission of enquiry was set up by the British, one member being the famous archeologist, Louis Leakey, who had grown up with the Kikuyu and had gone through Kikuyu manhood initiation rites. Misunderstandings existed, in that white settlers believed that they had bought land from the Kikuyu, but the Kikuyu considered that they were merely renting the land since, according to tribal law, no one could sell land without the consent of the clan. A second and third generation of white settlers was growing up on these farms and trying to dispossess the farmers would be utterly impractical - roughly equivalent to telling a third or fourth generation American farmer that his land belonged to the Indians. A previous commission had already given the Kikuyu 99,239 ha (245,120 acres) to compensate them for such errors. This was considered far more land than the Kikuyu's historical claim (Hunter & Mannix, 1954).

The Commission felt that still more land should be given to the Kikuyu. However, the population of Kenya had grown so swiftly that no new areas suitable for native farming were readily available. There were 100s of kilometers of semi-desert bush country, with so many boreholes sunk by colonists that the water table was dropping at an alarming rate and much of the groundwater had been found to be full of chemicals (e.g., assume sodium, potassium and magnesium salts – alkaline/high pH) that can rapidly result in soil salinization

(Hunter & Mannix, 1954) [see Chapter 5, Section 5.5.2, Physical and Environmental Constraints to Overcoming Food Production in Sub-Saharan Africa (SSA) and Section 5.5.2.3, Nutrients, pH, acidity and carrying capacity].

Compounding the population increase was the introduction by Europeans of unsustainable agricultural practices that once adopted, the Kikuyu refused to abandon. Before the coming of the whites, the Kikuyu had developed a system of traditional agriculture, rotating their crops, and preserving the soil and planting a number of different crops together (inter-cropping) so timed that one crop protected another. “Experts” from England explained that by separating the crops in different fields (mono-culture), the yield could be greatly increased. The natives tried it. The yield was indeed temporarily increased but heavy tropical rains washed away the topsoil. The experts realized their mistake and tried to induce the natives to return to their old system. The Kikuyu refused. They liked the high yield and had also begun to abandon their traditional crops in favor of new ones that were commercially more profitable but were also ruinous to the soil (Hunter & Mannix, 1954).

The commission concluded that the Kikuyu could not continue as a completely agricultural community. There was simply not enough suitable land to make it possible. Even if all of the Europeans left Kenya and their farms were turned over to the natives that would provide a solution for only a short time. The Europeans owned only about 20% (1/5th) of the land in Kenya and much of that was not suitable for the Kikuyu type of farming. At the rate the Kikuyu were increasing, the European farms would be little more than a “glass of water from a bucket” (Hunter & Mannix, 1954).

The commission felt that some attempt to find jobs for the Kikuyu - as artisans, tradesmen or in factories - should be made. Unfortunately, the enormous influx

of East Indians into the colony, many of whom were highly skilled artisans and tradesmen, made it difficult for the Kikuyu to compete in these fields (Hunter & Mannix, 1954).

The Swynnerton Plan of 1954 that encouraged small-scale Kikuyu farmers to engage in commercial agriculture was a political devise to counter the Mau Mau uprising that failed. The Kikuyu had already used the little understood compulsory terracing and other failed agricultural practices as a rallying point in the struggle against the colonial regime (Carswell, 2003 *In: Beinart & McGregor, 2003; Anderson, 2005*).

According to Parker (2005b) today

“there is little vacant land in traditional Kikuyu areas. When the land was originally broken down into privately owned parcels, there was a rule that further subdivision was not to be allowed and that one child would inherit the title, but pay out the others for what would have been their share on an even split between all. I don't think it worked and there are many properties now of less than 5 acres (<2 ha). The alternatives were for the surplus to move to towns and urban employment, or to buy land in other tribal areas. This pattern is common across the country with surplus population flowing out of the arable areas into the pastoral areas”.

In the 20th and 21st century this is resulting in major conflicts between the Maasai and Kikuyu throughout Kenya, as well as threatening critical wildlife habitat (Chapter 5, Section, 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya and Chapter 11, Section 11.11.9, Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact on Kenya's Wildlife Outside Parks) (Figure 3.3).

Over much of Africa as a result of the 20th century population explosion, parks and protected areas became hard-edged [e.g., Lake Naivasha Park in Kenya, Kruger Park in South Africa, Lake Mburo in Uganda (see Chapter 11, Section 11.11.2, Donor Driven Conservation, Lake Mburo National Park (LMNP) and Benoué, Boubandjida and Faro Parks in Cameroon (see Chapter 5, Section 5.9.3.4, Over-population and livestock, a threat to wildlife in northern Cameroon)] surrounded by fences of human poverty and degradation, which to this day are slowly being encroached upon, having no obvious value to the hungry masses living in a day-to-day survival mode.

The current human population of Sub-Saharan has increased 5.5-6.5 times during the 20th century to about 622 million people and is projected to increase another 2.3-2.7x in the next 50 years (see Chapter 5, Table 5.12: Existing and projected populations in Africa and Sub-Saharan Africa). Likewise, the livestock population has increased 2.3x between 1961 and 2003 (see Chapter 6, Table 6.2: Livestock numbers Sub-Saharan Africa, 1961-2003) and will likely grow relative to the human population. One key question which must be addressed is can the tsetse fly and the “Wilds” of Sub-Saharan Africa survive this continual onslaught of humans and their livestock, even with what an ecologist might consider natural ecological controls such as disease, war and famine? Can giving wildlife value to rural communities partially solve the tendency for human populations to push aside nature in trying to survive [see Chapter 9, Community-Based Natural Resource Management (CBNRM)]? Or as in the Pre-1890s East Africa, will growing populations push back the bush, but instead of leaving open spaces for game as in the past, create a man-made landscape of farms and mega-cities, in which wildlife has neither value nor place?

3.12 COMPARISON WITH EUROPEAN COLONIZATION OF NORTH AMERICA

“The Great Spirit is our father, but earth is our mother. She nourishes us; that which we put into the ground she returns to us, and healing plants she gives us likewise. If we are wounded, we go to our mother and seek to lay the wounded part against her to be healed. Animals too do thus, they lay their wounds to the earth. When we go hunting, it is not our arrow that kills the moose however powerful be the bow; it is nature that kills him. The arrow sticks in his hide; and, like all living things, the moose goes to our mother to be healed. He seeks to lay his wound against the earth...” (Big Thunder of the Wabanakis Nation, Maine, circa 1900 *In: Kemf, 1993*)

With a common European heritage, the colonization of both North America and Sub-Saharan Africa had many similarities, but also huge differences. In much of North America, especially the USA, the Europeans eliminated the indigenous peoples, became a majority and established laws integrating all citizens into accessing natural resources as part of their management. In Sub-Saharan Africa, population numbers were reduced as a result of colonization, though local people remained a majority. However, their natural resources, especially wildlife, were made legally available mainly to the European minority that settled on the African subcontinent. As a result of this history, while in Sub-Saharan Africa an estimated 95% of wildlife and other resources are accessed clandestinely (e.g., illegally, poached), in North America only 5% are believed to be taken illegally, there being little need to poach.

3.12.1 Commonalities between the European Colonization of America and Africa

A comparison is made with the European colonization of North America to show the similarities in impacts on its indigenous people and wildlife. The exodus from Europe resulted from the continent having become over-populated, having limited

land space, suffering from poverty and exhibiting many of the phenomena we see in Africa today that caused habitat destruction, deterioration of a limited natural resource base and that offered limited economic opportunities to the majority. Thus, for many there was nothing to lose by heading to foreign exotic lands such as America, Canada, Africa, New Zealand and Australia. Historical novels by James Michener such as Chesapeake (Michener, 1978) and The Covenant (Michener, 1980) provide a perspective on this desperation. Life could not be worse than what had been experienced in Europe. As the saying on the Statue of Liberty goes, “Give me your tired, your poor, your huddled masses yearning to breathe free”. The European “*invasion*” of America left a lasting impact on the landscape, its people and wildlife, from which the indigenous people of the world’s only superpower in the 21st century have never recovered and never will. On both continents until the arrival of the European, the indigenous people lived in some sort of ebb and flow of balance between man-made and natural systems. The American Indian, since the mega-fauna extinctions of the Pleistocene (see Chapter 1, Section 1.3.2, Man and the Extinction of Pleistocene Mega-fauna), had reached a balance with those species that remained.

As in Sub-Saharan Africa, traditional management systems that successfully controlled and manipulated nature to the benefit of man were ignored and superseded by European systems and values. Wildlife was seen as a resource in such bounty that it would never end, and the average European settler in the USA, as in Africa, who had been cut off from using wildlife back home, slaughtered the game first to survive, but most importantly as an economic resource.

3.12.1.1 God-given duty to conquer nature

As in Africa, out of ignorance regarding the functioning of these ecosystems, interventions by European settlers resulted in a degree of environmental

degradation that the indigenous people had never known. As in Africa, Europeans settlers, believing it their God-given duty, changed the landscape into orderly geometric patterns of farms, pastures and woodlots. “They found a garden and left a wilderness” (Lowenthal, 1990 *In: Lowenthal, 1997 In: Griffiths & Robin, 1997*). From 1650 to 1850, in eastern America, 46 million ha of forest had been cleared for settlement and agriculture. Until 1885, America’s industry relied on forests as a cheap source of energy, without which it could not have become a world power. By the turn of the century (1900), 121.4 million ha of forest had been lost in America, after which forest reversion became more dominant than forest removal (Williams, 1997 *In: Griffiths & Robin, 1997*). Today, it is estimated in the eastern United States that only 25% of the forest remains, of which 0.1% [one tenth ($1/10^{\text{th}}$) of one percent (1%)] can be considered to be in the pristine state found by the pioneers (Guggisberg, 1970).

Four centuries were required for whites in North America to learn that the Indians’ traditional management of their wildlife was far more advanced than they were willing to admit. The West and African governments still fail, for the most part, to accept and recognize traditional knowledge by Africans over the management of their resources and fail to integrate this knowledge and ability into plans for the sustainable use of Sub-Saharan Africa’s natural resources. In Africa, “traditional knowledge” is a new and still controversial concept. In fact, most African governments are still at war with rural resource users!

3.12.1.2 Ignorance of traditional management systems by colonizers

Lacking metal harder than copper, and thus unable to fabricate modern axes, the Indians of the eastern forests practiced girdling (removing bark from trees) and setting fire to clear their land. As in Sub-Saharan Africa, the eastern tribes practiced “slash and burn” agriculture and periodically moved their villages once

the soils in a given area were worn out, thereby creating a fallow system. Wood ash and fish were used as fertilizers. The cleared areas immediately around the villages were cultivated and provided protection from surprise attacks. The secondary forest (e.g., abandoned fields) as in Sub-Saharan Africa, provided regrowth of vegetational species used to make baskets, spear shafts, lodge frames, etc., as well as providing wildlife habitat. Stone tools were used to cut the saplings of maple, birch and dogwood to make arrow shafts. These were species that grew not in climax but secondary forests recovering from being opened up by fire. Birch bark was used to make canoes. Blueberries, cranberries, grapes and other fruit grew wild along these edges between fields and forests. The increase in biodiversity between ecotomes is known as the “edge effect”, and provided excellent plant species diversity. Likewise, secondary forests also exhibited increased plant diversity and thus wildlife habitat compared to the beech-maple-oak climax forests found over much of the East. In comparison, climax forests have little undergrowth, poor plant species diversity, and provide poor habitat and low carrying capacity for game (Trefethen, 1975).

Early pilgrims noted the park-like environment around Indian settlements, which provided the grasses and browse needed by white-tailed deer, elk, and buffalo. White-tailed deer, bobwhite quail, cottontail rabbits, turkey and ruffed grouse abounded in and along these edges. Thus, the Woodland Indian, through manipulation of the forest contributed more to the production of wildlife than he extracted (Trefethen, 1975). Marks (1976; 2001) similarly, noted that until the end of the 1970s, when the commercial ivory and bushmeat trade took off, game was plentiful around villages in the Luangwa Valley of Zambia, most hunting taking place within 3 km of villages.

As in Africa, traditional ties to wildlife as a nutritional, cultural and spiritual resource were ignored. In many cases, by cutting the indigenous people off from

this resource, a key element to their survival was taken away; in the case of the buffalo (bison), the complete inability of the Plains Indian to survive without subsidized support. As in much of Africa, wildlife traditionally served as a hedge against drought and as a major source of protein.

3.12.1.3 Genocide, Indian reservations and land hunger by European immigrants

“Our roots are deep in the lands where we live. We have a great love for our country, for our birthplace is here. The soil is rich from the bones of thousands of our generations. Each of us was created in these lands and it is our duty to take great care of them, because from these lands will spring the future generations of our peoples. We walk bout with great respect, for the Earth is a very Sacred Place” (Sioux, Navajo and Iroquois Declaration, 1978 *In: Kemf, 1993*).

By 1830, demand for land in the eastern USA was so great, as a result of both misuse and new European immigrants, that Congress passed the Indian Removal Act dispossessing the remaining Indian tribes of their land. This resulted in what some call the “Trail of Tears” as the Creeks, Cherokees, Chickasaws and Seminoles of the East were marched to “Indian reservations” in Oklahoma. Interestingly enough, a number of Creole-speaking Gullah fought alongside the Seminole Indians against the U.S. Government. The Gullah are ex-slaves who escaped early on in American history to the barrier islands from the Carolinas to Florida and who speak a language which is a mixture of English and those languages from the Gulf of Guinea (e.g. Sierra Leone, Ghana, Benin, Togo to northern Angola). Many Gullah were rounded up and became part of the “Trail of Tears” march, resulting in the establishment of Gullah-speaking communities in the modern state of Oklahoma. Thousands died along the way of the “long march” to their new and sterile homelands (Trefethen, 1975). Indians were placed on reservations to make way for white settlers, similar to the creation of

homelands and communal areas in East and Southern Africa. Similarly, the Indians ended up on the poorest agricultural lands, condemned to poverty, with the exception of where minerals or oil existed that the U.S. Government was unaware of. Many were and are still unable to survive without government handouts. Often, escaping meant/means leaving the reservation and abandoning what little was/is left of their culture to join the “White Man’s World”, or hiding behind a bottle of alcohol and drugs as one sees with the San of Southern Africa and the Baka Pygmies of Southeastern Cameroon.

This same land hunger by European settlers living in an over-populated and increasingly degraded eastern United States would soon spawn the “westward ho” movement of covered wagons to the western United States, with similar consequences for both the Indians and wildlife. In the “Wild West” Indians were hunted down like vermin, exposed to diseases for which they had no immunity (small pox, typhus, measles, influenza, bubonic plague, diphtheria, mumps, scarlet fever, whooping cough and syphilis), which had been brought in by the Europeans (Lewy, 2004), and had much of the wildlife plundered, on which their lives and traditions depended. “Decreased birth rates resulting from oppression and disruption of ways-of-life also had an impact” on American Indian populations (Wikipedia, 2005). Estimates of the American Indian population of North America vary from a high of 18 million (10 million in the USA) to a low of 1,152,950 before the coming of the European. By the end of the 19th century, in the United States only 250,000 Native Americans remained alive (Lewy, 2004). The question of explicit genocide such as providing small pox infected blankets is emotive and highly debated (Lewy, 2004; Brown, 2005; d’Errico, 2005; TheFurTrapper, 2005; Wikipedia, 2005). Today in North America, the once mighty Indian nations are a shadow of their former selves, surviving on the periphery of white man’s land that has been carved from their once bountiful territories.

3.12.1.4 Wildlife as a tool of conquest in North America

On both continents, the European invader saw wildlife as a tool for the exploration, expansion of white control and “development” of the country. Hunting and trapping, as in Africa, was a key ingredient in the European imperial conquest and development of North America, without which it might not have been “colonized and developed” (from a Western perspective) as quickly. As in Africa, in the first few years, until agriculture and livestock could be established, the frontiersman lived off the land, eating venison and waterfowl, and trapping beavers and other animals, whose furs they used for sale and barter.

For example, market hunters were contracted to bring more than three tons of game/week to Leadville, Montana’s mining camps, butcher shops and restaurants; a single hunter’s kill for the week of August 11-18, 1878 was 24 deer, 22 antelope, nine elk, five bighorn sheep and one grizzly (Rennicke, 1990). As in Sub-Saharan Africa, many species were greatly reduced or pushed to extinction from over-hunting by European settlers:

- **Auk.** As the European’s headed towards North America, one of the first species to go in 1840 was the flightless Auk, *Pinguinus impennis* (Trefethen, 1975), found on the rocky islands and coasts of the North Atlantic in Canada, Greenland, Iceland, the British Isles and Scandinavia (CMN, 2005). It was clubbed to extinction by European fishermen (Trefethen, 1975).
- **Eastern Elk and Wood Bison.** By the 1800s, the eastern elk, *Cervus canadensis canadensis*, and wood bison, *Bison bison athabascae* had succumbed to the human avalanche and domestic livestock (Trefethen, 1975).

- **Beaver.** By the 1830s, the beaver, *Castor canadensis*, was on its way to extinction in the Mississippi Valley. Further west a new breed of “mountain men” developed, trapping out the last of the beaver. The collapse of the beaver trade in 1831, as a result of silk now being preferred for men’s hats, came just in time to save this species from extinction (Trefethen, 1975).
- **Passenger Pigeon.** The last great nesting colony of passenger pigeons, *Ectopistes migratorius*, was discovered near Petoskey, Michigan in 1878. In a few weeks, 2,500 netters marketed 1,107,800,066 pigeons. The end of the passenger pigeon as a viable species occurred in 1881, when Grand Traverse County, Michigan netted 1 million birds. While market hunters helped finish off the passenger pigeon, the last known survivor dying in the Cincinnati Zoological Gardens on September 1, 1914, the real determining factor was “habitat loss” as settlers destroyed the virgin forests that passenger pigeons required for both food and nesting sites so that by the 1900s there was no place that could support such masses of bird life (Trefethen, 1975).
- **Heath Hen.** The heath hen, *Tympanuchus cupido cupido*, once ranged from Maine to Virginia but a combination of habitat destruction by expanding human populations and over-hunting resulted in it being confined almost entirely to the island of Martha’s Vineyard off Cape Cod, Massachusetts (Trefethen, 1975; Leakey & Lewin, 1995) by 1850 (Trefethen, 1975). A series of events, ranging from fires, introduction of the western race of “prairie chicken”, *Tympanuchus cupido pinnatus*, (resulting in possible interbreeding), the presence of local predators (fox, raccoons, skunks and in an influx of goshawks), the introduction of dogs

and cats, and blackhead disease introduced by turkey farming led to uneven sex ratios with males greatly exceeding females. This adversely impacted breeding and nesting success, and resulted in the population going from a high of 2,000 in 1916 to 50 by 1926. In 1930, one lone male was observed carrying out its ritual mating dance; he was seen again in 1932 for the last time. By 1925, the State of Massachusetts had spent US\$ 56,912 in the nation's first attempt to save an endangered bird; the attempt failed. In its original range of many thousands of km², the heath hen was virtually immune to extinction. Reduced to a tiny single population, it became vulnerable both to the vagaries of nature and to man related interventions (Trefethen, 1975).

- **White-Tailed Deer.** A long open season without bag limit and the continued loss of habitat by the ever-expanding European immigrants resulted in white-tailed deer, *Odocoileus virginianus*, being nearly wiped out by the time of the Revolutionary War in the mid-1700s (Trefethen, 1975).
- **Plains Buffalo.** Plains buffalo, *Bison bison*, at one time numbering 75 million, was a commodity used by explorers, settlers, trappers and rail lines in opening up the West. Knowing that elimination of the buffalo would subdue the plains Indians, who depended on buffalo for food, housing (tepee), clothing and utensils, in 1874, President Ulysses S. Grant, on advice of General William Tecumseh Sherman, pocket vetoed a bill passed by Congress to “ ‘prevent the useless slaughter of the buffaloes within the Territories of the United States’ ” (Trefethen, 1975). The most brutal and wasteful chapter in the history of America’s wildlife was that within a decade, from about 1871 – 1881, these massive herds, numbering in the millions, were virtually eliminated (Trefethen, 1975). As Sherman

said, “ ‘Every buffalo dead is an Indian gone’ ” (Guggisberg, 1970). In 2004, there were about 16,000 buffalo left in the wild, with the only remaining free-ranging herd of 3,800 in Yellowstone National Park. However, about 231,950 plains buffalo are raised commercially on 4,132 ranches across the United States (Eilperin, 2004).

Further evidence of the destruction that existed by the end of the 19th century is contained in Table 3.2.

3.12.1.5 Introduction of exotic species

As in Africa, European-introduced domestic livestock brought in disease and competed with wildlife for food and space. Exotic trees had similar impacts on native vegetation. By the beginning of the 20th century, both the wildlife and wildlife habitat were in a bad state. As in Sub-Saharan Africa, a conservation ethic towards wildlife did not develop until after the conquest of the continent by the Europeans (Trefethen, 1975).

3.12.1.6 Parks and reserves after the conquest

The creation of parks and protected areas, separating humans from nature, while allowing them to visit it on weekends, was only started after wildlife populations had been decimated and white settlers had taken control of North America by force. America was also beginning to industrialize, creating a *nouveau riche* class out of which emerged the 19th century sports hunter. In 1844, the New York Sportsman’s Club was formed for the protection and preservation of game. It helped draft model game laws with seasons for woodcock, grouse, deer and trout. Federal (central) government took little interest in conservation through the 1800s

with no federal laws to protect wild birds, mammals or fish and no enforcement agency; national parks were still being protected by the U.S. Army.

Table 3.2: Over-exploitation of wildlife and its habitat in pre-industrialized America and its recovery in the 20th century from conservation efforts – mainly by hunter-conservationists

SPECIES	DATE/TOTAL NUMBER IN USA	TOTAL NUMBER IN 2001
White-Tailed Deer ¹ <i>Odocoileus virginianus</i>	1900 < 500,000 1985 <55 million	36 million ¹ 105 million ²
Duck ²		
Rocky Mountain Elk ³ “Wapiti” <i>Cervus canadensis</i>	1907 <41,000	1.2 million ³
North American Wild Sheep ⁴ <i>Ovis canadensis</i> ssp.	1900s <10,000	230,000 ⁴
Wild Turkey ⁵ <i>Meleagris gallopavo</i> ssp.	1890s <30,000	6.4 million ⁵
Pronghorn Antelope ⁶ <i>Antilocapra americana</i>	1910 <15,000	1 million ⁶
Black Bear ⁷ <i>Ursus americanus</i>	1900 – Unknown but numbers significantly reduced	1 million ⁷
North American Moose ⁷ <i>Alces americana</i>	1937 <14,000	1.2 million ⁸

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1. Buckmasters American Deer Foundation and Quality Deer Management Association
 2. Ducks Unlimited (DU) – 2002 highest numbers in recorded history.
 3. Rocky Mountain Elk Foundation (RMEF)
 4. Foundation for North American Wild Sheep (FNAWS)
 5. National Wild Turkey Foundation (NWTF)
 6. North American Pronghorn Foundation (NAPF)
 7. Conservation Force
 8. North American Moose Foundation

Source: Jackson (2002) with permission, Conservation Force.

On March 1, 1872, President (General) Ulysses S. Grant signed into law a congressional bill creating the first American Park, Yellowstone, encompassing an area of 8,671 km² (3,348 mi.²) area (Trefethen, 1975). Yellowstone was established on Crow, Blackfeet and Shoshone-Bannock Indians' territory. A subtribe of the Shoshone lived year-round within the present bounds of the park, while the other tribes used the area seasonally for hunting and fishing. Indians had lived in this park for at least 800 years. As was the case with the creation of African parks and protected areas, they did not leave willingly. In the summer of 1877, 300 people were killed in a conflict between tribal groups and civilian officials. By 1886, administration of the park was turned over to the U.S. Army (Kemf, 1993).

The main impetus for establishing this park was to save one of the last remaining buffalo herds. After seeing the slaughter of big game in the western USA, Teddy Roosevelt, often known as the “father of America’s national parks”, and also an avid hunter, founded the Boone and Crockett Club with other hunters in 1887 to fight for the sustainable use of big game in North America. He later became America’s 26th President. This was followed by the creation of Sequoia, General Grant and Yosemite National Parks (Trefethen, 1975). Yellowstone became the model for all future parks. It was an exclusion zone separating people from wildlife, in which there was little or no active management of the resources, allowing “nature” to take its course, but without one of the key components of nature involved – man! Although the first model for national parks began in America, Vande weghe (2004) argues that the concept germinated in the Cape region of South Africa around 1850 by Ludwig Pappe, an Austrian surgeon, concerned over the rate of deforestation. This led to the first forest law of 1846 and then the Forest and Herbage Preservation Act in 1858 that helped in the establishment of the first faunal reserves. Pappe’s successor as botanist-in-chief of the colony, John Brown, eventually returned to Scotland where he continued to

write on forest and water conservation. His writings eventually made their way to North America, which influenced the publication of *Man and Nature* in 1864 by G.P. Marsh. Ideas emanating from this publication became the basis for creation of Yellowstone National Park. This idea would then come full circle with the establishment of the first national park in Africa, Albert in 1925.

Though a bit late in coming, as in Sub-Saharan Africa, the eventual recovery of wildlife in the United States started early in the 20th century. Conservation actions were taken by sport hunters, who eventually developed organizations, as noted above (Table 3.2), that are dedicated to the enhancement of particular game species and their habitat, and who worked hand in hand with state fish and game departments to build up these populations, while hunting them for recreational, cultural and subsistence purposes. In contrast, in Sub-Saharan Africa, resource users and wildlife/parks departments to date have generally failed to find common grounds on which to collaborate in the conservation of natural resources. Being in a relationship of conflict, in most cases Sub-Saharan Africa's parks and protected areas served/serve more the interests of Western tourists/hunters and NGOs than those of Africans (see Chapter 9 on Community-Based Natural Resource Management and Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers).

Eastern White-Tailed Deer's Remarkable Recovery

The white-tailed deer had its habitat usurped by cattle, sheep and goats, and was hunted excessively for its flesh and hides. It was soon eliminated from the colonial coastal settlements and river valleys. Logging that created secondary habitat resulted in deer populations increasing compared to populations in virgin forests where there numbers had been very low.

The first game legislation in the USA was to protect the white-tailed deer with a closed season from spring to fall of each year. However, the long open season, without bag limit and the continued loss of habitat by the ever-expanding European immigrant population resulted in white-tailed deer being nearly wiped out by the time of the Revolutionary War in the mid-1700s. These colonial laws, as in Sub-Saharan Africa, were initially ineffective, but did establish a basic foundation for the protection and management of wildlife (Trefethen, 1975).

White-tailed deer reached a low point in numbers between 1870 and 1900 (Trefethen, 1975) because of the killing of deer for profit (Miller, 2002), as well as habitat loss. The Lacey Act of 1900, which assisted in ending market hunting, helped to save the white-tailed deer (Miller, 2002). Black bear and turkey had been reduced to even lower levels. Only in the West did one find “big game” animals in significant numbers (Trefethen, 1975), and even their numbers were not at a peak high (Table 3.2).

The proper name for this deer is the “Virginia white-tailed deer”. In Virginia, it had been just about wiped out. By 1931, recovery was slow, as there were only 25,000 deer left in the entire State of Virginia; less than $0.8/\text{km}^2$ ($2/\text{mi}^2$) (Miller, 2002). In the first part of the century, there were enough white-tailed deer to allow the walls of the hunting and fishing cabin of Lancelot Jacques,⁴⁴ on Little Hunting Creek in the Catoctin Mountains of Maryland, to be adorned with deer antlers, even a monster 16 point eastern count trophy. By the time, the principal author was old enough to hunt in the early 1960s one had to be lucky to see a white-tailed deer, let alone shoot one in the State of Maryland. Hunting was more of a ritual, with little hope of gaining meat or a trophy.

⁴⁴ The primary author’s grandfather of Huguenot descent similar to many South Africans.

By 2002, the white-tailed deer populations in these states had recovered. There were an estimated 1.25 million white-tailed deer in the states of Maryland (250,000) and Virginia (1 million). There were more deer than when the first colony in America, Jamestown, Virginia, was established in 1607, when the deer population in the two states was estimated to be only 500,000 in number (Miller, 2002).

Thus, it took almost 1.5 – 2 generations for the deer populations to recover and then explode to the point where they are actually a pest, getting into people's gardens and causing major road accidents (Miller, 2002). Nation-wide, it is estimated that annually white-tailed deer result in 1.5 million traffic accidents resulting in US\$ 1.1 billion damage and 150 deaths (Ashton, 2003; CNN/Money, 2005). The incredible success story of the white-tailed deer recovery is attributed to reforestation, farms being abandoned (going back into secondary forests) and restocking (Miller, 2002). Initially strictly enforced game laws were put into place such as shooting only forked-horn bucks (two-year olds) or older males in order to retain does for breeding to build up the population.

The trap and transfer method as a means of regulating deer populations costs US\$ 800/deer and is too expensive, just as is the case with elephants in Sub-Saharan Africa. As in Sub-Saharan Africa, it is a temporary fix, as the number of new places (available habitat) to transfer deer is limited by there being too many deer everywhere. Reintroducing bobcats and wolves as natural deer predators is too dangerous given the number of people living in and around the deer, and an unproven method. Deer birth control has also proven controversial, as with African elephant whose populations are in need of control. "Contraception alone cannot reduce overabundant deer populations to healthy levels...to be used in conjunction with other wildlife management methods", and cannot eliminate the

need for hunting (USDA/APHIS, 2005), even if they eventually would prove effective to some degree.

Allowing hunters to shoot and kill deer is considered the easiest and least expensive method to reduce the population. In Maryland in 1996, more than 100 deer were killed by cars around Seneca Creek State Park near Gaithersburg, Maryland, while after allowing sport hunters to thin the herd, only 50 automobile accidents happened. In this case, the fish and game department used hunting as a major management tool to protect both habitat and people (Miller, 2002).

By the mid-1990s in Virginia and Maryland, the East in general, the deer population had become so large that it became necessary to thin the herds by significantly reducing the number of reproductively active females. In herding animals, one male can service many females. Some states, such as Virginia, allow a hunter, to continue hunting on his/her license as long as female deer are harvested. As soon as a buck is harvested, the season is over, or as in Maryland, two females must be killed before another buck can be taken. This provides a stark contrast to the 1960s when one was lucky to see a deer. In 2001, of the 83,787 deer killed in Maryland, 50% were female (Miller, 2002)

White-tailed deer have also adapted well to the “edge effect” created by backyards and parks in urban America. Suburbia provides deer with an Eden of trees, shrubs, gardens and flowers in which they can flourish. In 2002, there were so many deer living in amongst the homes and community forests/green belts in suburbia that the Virginia Department of Game and Inland Fisheries could not meet its yearly deer reduction quota necessary to maintain habitat quality (e.g., prevent over-browsing by deer).

Fairfax County, Virginia, and Minneapolis St. Paul, Minnesota have developed urban deer hunting programs allowing the use of bow and arrow as a means of deer reduction in suburbia. Hunters literally hunt between homes and back yards. The bow and arrow is the weapon of choice as; rifle hunting in such crowded areas is too dangerous.

The situation became so bad that in 2002 that a buck ran amuck through a supermarket in Blacksburg, Virginia (home of the Virginia Polytechnique Institute – VPI) and in the U.S.’s capital two bucks jumped through the window of a MacDonald’s hamburger franchise in northeast Washington, D.C. In 2001, there were 4,229 automobile crashes between vehicles and deer in Maryland and 6,030 in Virginia. The estimated damage was US\$ 50 million in damage (Miller, 2002).

In Maryland, the dwindling numbers of hunters are considered the biggest obstacle to controlling deer populations. Ironically, too many young people, who a generation ago would have been deer hunting, even though there weren’t any, are content to stay home, watch TV and play video games; the number of licensed hunters in Maryland declining from 180,000 to 140,000 since 1970; the number of young hunters under 16 years of age dropping from 23,000 in the 1970s to 7,000 in the early 1990s. Junior hunter programs by the state have brought the number of youths up to 9,600 in recent times, which is believed to be a key to controlling deer populations in the future, “Suburban deer are going to be on the radar for a long time. It’s going to be an issue in this state forever”, says a Maryland game official (Miller, 2002).

Certainly, throughout its range in the USA, the Virginia white-tailed deer recovery can be considered an over-whelming success; some say too successful.

Maybe one of the most important lessons to be learned and contrasts to be seen, when comparing the U.S. to Sub-Saharan Africa, is that in Africa wildlife is mostly found in parks and protected areas, and/or on private mostly white-owned ranches and enclosed game ranches. No buck would ever have a chance of making it to suburbia in most of Sub-Saharan Africa, as it would be eaten along the way. It was not that long ago that the same situation existed in America. In many states, schools were closed on the opening day of hunting season since most young boys would be in the field with their fathers hunting game as a food supplement. In America, going through an urbanization and industrialization process and taking the people away from a direct dependency on nature helped take pressure off the wildlife and the habitat. This also gave people the luxury to develop a conservation ethic and awoke an interest in buying into conservation and wildlife recovery programs (quotas, seasons, reintroduction programs and habitat recovery programs) and ultimately allowed the habitat and wildlife to start recovering. In addition to devolution (land and resource tenure – See Chapter 9), this provides a hint of the direction that Sub-Saharan Africa may have to consider taking in the 21st century, if wildlife and its natural systems are to survive the onslaught of humanity.

On the downside, in the urbanized West, a small but vocal percentage of the population is so isolated from wildlife that they fail to understand the need for its management and the strong cultural ties of the hunt to society. These “animal rightists”, as they call themselves, virtually worship wildlife, being against its sustainable use.

3.12.1.7 Park-preservation policies

In America, settlers hunted in national parks until 1894, when legislation prohibited multiple use (MacKenzie, 1997), turning them into areas of preservation where a “natural regulation” policy tended to exist. As in Africa, this meant complete protection and no active management or manipulation of the systems. This resulted in no burn policies, among others. Not until the 1990s did ecologists begin to view fire as part of the natural cycle in many ecosystems, especially in western USA. The build up of biomass, which was not natural, resulted in extremely hot fires, also not natural. These hot fires had a major impact on vegetation and in turn game populations as documented in Yellowstone and Rocky Mountain National Parks (Hess, 1994).

Whereas indigenous and pioneering settler populations lived in nature and exploited it, the national parks were meant to be a corrective to industrialization and urbanization. They were meant to show increasingly urban societies (beginning in the USA and eventually urbanized industrialized South Africa with the establishment of the Kruger National Park) of the 20th century what nature had been like before human influence. They were to be a powerful civilizing influence that would remove “the hunting instinct”, the “best weapon whereby Man’s impulse to destroy the beasts of the forest for his own pleasure and profit can be fought and conquered’ ” (Stevenson-Hamilton, 1940 *In:* MacKenzie, 1997).

3.12.2 Sustainable-Use in Forest Reserves

President and hunter conservationist Teddy Roosevelt, with the help of Gifford Pinchot, the “father of modern forestry management” in America, focused on national forest reserves, which by 1896 had expanded to 8,615,320 ha

(21,279,840 acres) as centers of conservation through sustainable use (e.g., hunting, fishing, grazing and logging) (Trefethen, 1975). Forest reserves were often bordering parks, which would stock the reserves for the “hunting elite”. Parks and forest reserves represented a demarcated land use between human cultivators and fauna (MacKenzie, 1997). Similar concepts existed in Africa, where for example hunting blocks in the Luangwa Valley, Zambia or the savanna hunting blocks of Cameroon surrounded core parks that fed/feed game into these areas, while the hunting blocks both buffered/buffer the parks from human interference and served/serve as important income generators.

3.12.3 Beginning of the Green Movement

In 1892, the well-known preservationist John Muir formed the Sierra Club. Here was the beginning of a dichotomy and an ideological battlefield between groups like the Sierra Club, the beginning of the “green movement”, which philosophically believed in the full protection of natural areas, and other groups such as Boone and Crockett that believed in regulated use or “management”. The word “Conservation” as applied to natural resources did not come into the English language until 1907 put forth by Gifford Pinchot to describe the interrelationship and sustained-yield use of forests, soils, waters, fish, wildlife, minerals and other natural resources (e.g., in Africa game reserves and hunting blocks; in America state and federal forests, Bureau of Land Management land). “Protection” and “Preservation”, then in common use, meant non-use – a locking up of the resources (e.g., creation of national parks), a concept that grated on Pinchot’s practical sensibilities (Trefethen, 1975). Many professionals and laymen on both continents misuse the word “conservation” when talking of parks. Even hunters fail to associate their actions with the word “conservation”. As in Africa, government at both the state and federal level took more and more responsibility

for managing America's wildlife, fish, trees, and public grazing areas (Trefethen, 1975).

3.12.4 Land and Resource Tenure

One big difference between many small-scale rural societies in Africa and America is that the American Indian's own their own lands and their "reservations" are considered "nations" within a nation. In Sub-Saharan Africa, other than on a small amount of white-owned and even smaller amount of black-owned commercial farms, mostly in Southern Africa and Kenya, the majority of land and associated natural resources are owned by the state. As is discussed in Chapter 9, Section 9.9, WHITE MOUNTAIN APACHES, LESSONS TO BE LEARNED FROM AMERICA FOR AFRICAN CBNRM, it required a lawsuit that went all the way to the Supreme Court of the United States for American Indians to start getting their wildlife back. Where this has occurred, wildlife tends to integrate the socio-cultural values of Indians into the management of wildlife and other resources, as well as serving as an economic resource for the community. At independence, Sub-Saharan African states tended to nationalize all land and valuable resources, including wildlife. In Sub-Saharan Africa, these battles have yet to be fought; land and resource tenure being a major hurdle to true democracy (see Chapter 11, Section 11.6, AFRICAN DEMOCRACY IN THE 20 and 21ST CENTURIES). Many Kenyans communally own their land (see Chapter 5, Section, 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya), and today are fighting to get their wildlife back (see Chapter 11, Section, 11.11.9, Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact on Kenya's Wildlife Outside Parks).

3.12.5 Differences between the European Colonization of America and Africa

As discussed, the Indian numbers were reduced and subdued by Europeans through genocide and the introduction of diseases, against which the Indian had no immunity (e.g., small pox) (see Section, 3.12.1.3, Genocide, Indian reservations and land hunger by European immigrants) to about 250,000 by the end of the 19th century. Thus, their populations never became dominant as opposed to the Sub-Saharan African's whose number increased about 5.5-6.5 times in the 20th century, in many instances placing them out of balance with their surroundings (see Section 3.1.7.2, Cultural genocide and Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY).

Urbanization and industrialization in 20th century North America gave people wealth, and removed them from the day-to-day dependence of surviving on and so closely depending on nature. Therefore, they could afford the luxury of developing a modern “conservation ethic”, which if one is honest reflects the traditional conservation mores of the American Indians and rural Africans who respected nature and attempted to live in some sort of balance with it. By contrast, even in 21st century Sub-Saharan Africa current game, fish and forestry laws disenfranchise Africans on an over-populated and under-developed continent so closely tied to and dependent on nature for day-to-day survival. Thus, with few exceptions (e.g., industrialized and urbanized South Africa), a subsistence lifestyle does not permit the luxury of developing a conservation ethic in a Western sense (e.g., biodiversity conservation, sustainable use, etc.). Meanwhile Africans’ traditional conservation ethic of sustainable use tied to the ancestors and spirit world as with the American Indian, has been highly eroded and/or eliminated due to colonialism and the last 40 years of independence – for the most

part a continuation of colonial laws – that have legally separated them from their resources and forced them into short-term relationships with wildlife and other resources over which they have little or no control. This centralized

“approach was bolstered in the post-colonial era by a belief in state direction of the economy; in governments as major employers; and in political ideologies favoring public ownership and control of potentially productive resources” (Roe, *et al.*, 2000).

National parks (preservationist areas as in both America and Sub-Saharan Africa), national forests and state parks (multiple use areas as are many game reserves and hunting blocks in Sub-Saharan Africa) were made affordable and available to all Americans regardless of race, creed, color or political affiliation (Table 3.3), whereas in Sub-Saharan Africa, 99% of the people are cut off from and cannot afford the luxury of taking advantage of these natural systems.

In America the management of wildlife, except migratory species (mostly dove, ducks and geese) is mostly delegated/decentralized to the State as opposed to the Federal Government, whereas in most of Sub-Saharan Africa control is vested in central government, an exception being South Africa with provincial control of all hunted species. In America, wildlife and other natural resources became “Common Property Resources” managed by government “for the people”, often in co-management relationships with sportsmen. Up until recently, the majority have been of European decent, though this is rapidly changing with globalization. In North America, public land, other than national parks, tends to be managed for the multiple use of resources available and affordable to the public, from petrol station attendants to medical doctors. Meanwhile in Sub-Saharan Africa governments managed and continue to manage wildlife and public land “against the people”, in the interests first of “a European settler elite” and today for “an overseas white elite” mostly from America and Europe.

Table 3.3: The majority of U.S federal and state lands permit multiple use of resources by citizens

USA SURFACE AREA (1)	9,826,630 km ² (3,794,083 mi. ²) or 9.8 x 10 ⁸ ha or 24 acres x 10 ⁸	
FEDERAL PROTECTED AREAS: Hectares (Acres)		
National Forests	77.3 million (191 million) (2)	Allows Multiple Use Of Resources
Bureau Of Land Management	77.7 million (192 million) (3)	Yes (hunting, fishing, logging, some grazing)
National Park System	107 million (264 million) (2) (3)	Yes (hunting, fishing, grazing)
National Wildlife Register	33 million(82 million) (2) 34 million (84 million) (3)	Yes (fishing)
Total Federal Protected Areas	38.1 million (94 million) (3) 217.3 million (537 million) (2) to 256.8 million (634 million) (3)	Yes, (hunting and fishing priority uses) Total Multiple Use: 217.3 million (537 million) (2) to 256.8 million (634 million) (3)
STATE SYSTEM OF PROTECTED AREAS: Hectares (Acres)		
Wildlife Management Areas (WMAs)	20.2 million (50 million) (3)	Allows Multiple Use Of Resources
State Parks	3,174,863 (7,841,914) (3) (4)	Yes (hunting and fishing)
Recreational Areas	516,978 (1,276,910) (3) (4)	?
Natural Areas	416,096 (1,027,756) (3) (4)	?
Historical Areas	31,892 (78,774) (3) (4)	?
Environmental Education Areas	38,269 (94,525) (3) (4)	?
Scientific Areas	4,463 (11,024) (3) (4)	?
Forest Areas	311,774 (770,082) (3) (4)	Yes (hunting, fishing, logging)
Other	58,630 (144,816) (3) (4)	?
Fish and Wildlife Areas	166,037 (410,112) (3) (4)	Yes (hunting and fishing)
Miscellaneous Areas	87,734 (216,703) (3) (4)	?
Total State Areas	4.8 million (11.8 million) (4) to 25 million (61.8 million) (3)	Total Multiple Use: 3.7 million (8.8 million) to 23.8 million (58.8 million) (3)
Grand Total Federal And State Protected Areas	222 million (549 million) (2) (4) to 282 million (696 million) (3)	221 million (546 million) (2)(4) to 281 million (694 million)
Percentage of Total Protected Areas Allowing Multiple Use		99.6%
Percentage Total Land Area	22.7% (2) + (4) to 28.8% (3)	

Sources: (1) Encarta (2006), (2) Nix (2006) with permission, Nix (3) Jackson (2006), (4) McLean (1997). Prepared by principal author.

Thus, over most of Africa, wildlife and other resources became and remain “Open Access Resources” legally not accessible by the majority of the citizens, which forces them to become “poachers” of wildlife, fish, forests, pasture, etc. Africans see caretakers of natural resources (e.g., game wardens and guards, forest guards, park wardens/guards, fish wardens) as the enemy who is keeping them from the resources they need for survival. In contrast, 95% of the resources in North America are legally harvested in the interests of its citizens, who collaborate with the game wardens, while in Sub-Saharan Africa 95% of the resources are poached making sustainable management impossible since the responsible management bodies have become “enemies of the people”.

3.12.5.1 Development of an anti-market hunting wildlife culture in America

From the above, it can be ascertained that habitat loss (e.g., of the passenger pigeon, eastern elk and wood bison) along with expansionist strategies of the newly emerging and rapidly growing American nation (e.g., elimination of the buffalo) played key roles in the extinction and/or significant reduction of these species on the North American continent. As a result, due to the perceived adverse impacts of commercial market hunting on wildlife, the American public developed a “wildlife culture” in the United States that is anti-commercial use (Thomson, 2003). While America allows hunting for both cultural and non-commercial purposes, this is based on a limited offtake, and with few exceptions depending upon the state (e.g., paying processing fees for game meat donated to the hungry/poor, fundraisers by not-for-profit sportsmen’s groups, American Indians to each other) the meat from free ranging wildlife cannot be sold for profit. Selling of other game parts is highly regulated (ODFW, 2004; PGC, 2004; State of Texas, 2006; TWRA, 2006; DGIF, 2007). Until recently, the only game meat one would find in an American restaurant would be exotic game that comes from high fenced ranches, mostly in Texas. Since the early 1990s, game ranching

of indigenous elk, deer and bison is growing in the USA to meet the demand for trophy hunting, meat, leather and elk antler velvet for the Asian medicinal market. The North American Deer Farmers Association members in the USA and Canada own over 385,000 cervid livestock of which indigenous species of elk and white-tail deer make up 26.9% and 4.6% of the population respectively, the rest being exotics (NADEFA, 2007). The “inability of native white-tailed deer to utilize warm-season perennial grasses does not allow them to be farmed as readily as the introduced deer species and elk” (Evers, 2006). By 2000, the USA had 1,200 elk ranches with over 70,000 elk. Chronic wasting disease (CWD) has adversely impacted both domestic and international markets for elk (Hansen, 2006) and deer (APHIS, 2002). There are an estimated 500,000 bison in North America of which 95% are on about 4000 private farms or ranches (NABSG, 2006). Of this, there are about 150,000 bison in the USA, of which 20,000 are slaughtered/year compared to 125,000 cattle/day (USDA, 2003). Even with these advances, the sale of game meat in restaurants and supermarkets, as well as game derived curios is relatively uncommon in America compared to Southern Africa.

This conflict of “wildlife cultures” manifest in how America perceives wildlife, is seen throughout this evaluation but comes out most strongly in how an industrialized and urbanized United States, which dominates the Convention on International Trade in Endangered Species (CITES), relates to rural resource based Sub-Saharan Africa with regard to the latter’s desire to commercially market its wildlife, especially elephant and rhino byproducts, but also other species (see Chapter 10). It is also seen in the imposition of Western urban values towards wild areas, in the continual disenfranchisement of rural Africans from their natural systems in the 21st century with Western money channeled through Western NGOs (see Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers).

3.13 CONCLUSIONS

As seen from previous chapters, it can be concluded that the indigenous people of Sub-Saharan Africa were anything but uncultured, and in many cases managed and controlled their environment in sophisticated ways that the Europeans first ignored out of ignorance, but which they eventually either learned: 1) from the African, 2) after many failures through trial and error, or 3) through his Western “scientific approach” to study. It can be contended that if the Europeans had not tried to dominate nature and conquer the “*savage tribes*” of the subcontinent, but instead had collaborated with them, they could have avoided wasting much time and effort in learning and adopting/adapting to how Africans managed their natural resources.

European imperialism in both Sub-Saharan Africa and North America brought these continents’ evolving indigenous civilizations and the management of their natural resources to a halt and steered them into evolutionary dead ends. Cultures and in some cases entire ethnic groups were wiped out to make way for the colonial masters and their approaches to conservation.

Human populations were low relative to the resource base when the Europeans arrived. Africans traditionally practiced extensive management of their natural resources through territorial controls, taboos, totems, hunting guilds, etc. With few exceptions, wildlife was more a resource for consumption than trade, and where trade existed, relatively unsophisticated weapons combined with low human numbers limited the offtake to sustainable levels.

However, the Europeans with their capitalistic approach to wildlife and the evolution of sophisticated firearms from the musket, to the rifle, black powder and

smokeless powder, were able to impact wildlife populations in a way never before seen by Africans and American Indians in recent history.

On both continents, wildlife was first a tool of conquest played out to the end, and later a pursuit of “sporting” gentlemen. By the beginning of the 20th century, wildlife on both continents had been nearly wiped out by European settlers and measures were taken to protect it. In Sub-Saharan Africa, indigenous people were both blamed and punished for this demise; game/forest reserves and parks were created, separating people from wildlife and other key resources needed for both physical and cultural survival. Africans were separated and then excluded from these natural systems in favor of European settlers and later rich tourists, primarily from Europe and America.

In contrast, in America, orders of magnitude more of the country’s public land was placed into multiple use conservation areas (state and national forests, many state parks, Bureau of Land Management lands, wilderness areas, etc.) than into preservationist parks, though few Americans Indians remained to take advantage of this, their numbers being significantly reduced from as high as 10 million prior to the coming of the European to about 250,000 by the end of the 19th century. These public multiple use areas were available for hunting, fishing, hiking and camping, grazing livestock, timber and firewood harvesting. Over the past 50 years, monitoring programs have been established to assure that these resources are sustainably harvested.

Centralized control by the colonial powers in Sub-Saharan Africa and the state’s subsequent failure to successfully manage these resources, turned what had been “Common Property Resources” into “Open Access Resources”, of which 95% were harvested clandestinely, in other words “poached” by rural Africans for both cultural and subsistence purposes. Most pre- and post-colonial governments, with

little knowledge of intensive management other than lighting random fires in the dry season to obtain a second flush of grass, relied primarily on repression as their primary management tool, operating as paramilitary forces against communities peripheral to parks and protected areas. This approach has failed.

It can be argued, that by turning wildlife and other resources into “Open Access Resources”, Africans were forced to regard them as short-term commodities over which they had lost control and which had to be mined before the next person took them. This also favored the conversion of natural systems by rural Africans into man-made systems, “farm land”, or pasture for livestock, over which they had some control.

Just as importantly, but rarely discussed, is that Africans, through the creation of game reserves, parks and hunting blocks, and through displacement by European settlements, were compressed onto lands, whether formal or informal native reserves, that could not support their populations given the carrying capacity of the lands and their ecological limitations. The impacts of compression on farmers and pastoralists are discussed in subsequent chapters. This resulted in the loss of wildlife and its habitat (e.g., deforestation, soil degradation, over-grazing and desertification) and the general impoverishment of both people and the resource base. At worst this process of disenfranchisement in the 21st century has resulted in the continuation of eco-genocide that began under colonialism, obliterating cultures from the face of the earth that have lived in harmony with nature for hundreds if not thousands of years, sustainably managing their natural resources. This is discussed in later chapters, where it is occurring in the name of conservation and biodiversity, being fueled by money from the West funneled through over-zealous Western NGOs and African governments. These governments’ bureaucrats have largely been trained at Western universities and have adopted American and European protectionist ideologies, and/or have sold

out to the perks (e.g., vehicles, overseas trips, per diems, etc.); a form of emerging neo-colonialism.

The disruption of traditional management systems, which were replaced by failed Western systems, displacement, compression, and over-exploitation of wildlife, was compounded by the population explosion in Sub-Saharan Africa that increased about 5.5-6.5 times during the 20th century to about 622 million, the commercialization of wildlife for bushmeat to supply the demands of growing urban centers and the international ivory/horn trade. By the time independence from colonial rule came in the early 1960s, the natural resource base over most of Africa was under tremendous pressure from the growing tidal wave of human poverty. As the well-known safari operator Robin Hurt (*pers. comm.*), who was raised in Kenya explained, “When I was a boy there were ‘Islands of People’ surrounded by a sea of wildlife. Today, there are ‘Islands of Wildlife’ surrounded by a ‘Sea of People’ ”. Both he and Fred Duckworth (*pers. comm.*) estimate that wildlife in Kenya and Tanzania is 25% of what it was in their youth; a 75% reduction in numbers. These men are in their 60s. Between 1977 and 1994 alone, the overall wildlife populations in 18 rangelands districts of Kenya have decreased by 44% (Barrow, *et al.*, 2000). Due to man and the increase in his livestock, wildlife today makes up only 10% of the large herbivore biomass in Southern Africa (Cumming, 2005).

Current human populations, expected to more than double in the next 50 years, combined with failing extensive farming and pastoral systems in Sub-Saharan Africa, have placed tremendous pressure on both wildlife and its critical habitat. African governments and rural communities have a tremendous need for the introduction of intensive management systems, of which other than in a few countries (e.g., South Africa, Namibia, and in the past Zimbabwe) there is little experience, mainly in white hands. Over much of the continent, a great deal of

the traditional knowledge and controls over managing Africa's natural resources, including wildlife, have been lost or degraded in favor of failed Eurocentric approaches. Meanwhile in Southern Africa, especially South Africa, as in the USA, Western concepts of intensive wildlife and habitat management have been developed and adapted to the subcontinent over the past 200-300 years. They are applied on both game ranches and in national parks. There is a crying need to record traditional knowledge of wildlife management and to integrate it into modern Western designed and imposed management systems, taking the best of both worlds, while working in collaboration with the true stakeholders, the rural people of Africa, who will ultimately determine if wildlife on the subcontinent survives or is eliminated. These issues are discussed in detail in forthcoming chapters.

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Chapter 4

4.0 IMPERIALISM, INDEPENDENCE AND FRESHWATER FISHERIES IN SUB-SAHARAN AFRICA

This is a continuum of the last chapter, but instead of wildlife, it will examine how imperialism impacted upon aquatic biodiversity, especially indigenous/endemic fish species and the socio-economic conditions of fishermen. The introduction of exotic fish species was widely practiced for many reasons, often in attempts to increase fish production, and/or to introduce “sport fish” for the colonial settlers.

4.1 INTRODUCTION

European trout have been introduced into the highlands of East and Southern Africa such as the Aberdare Mountains of Kenya, the Rwenzori “Mountains of the Moon” of Uganda/DRC, and Drakensberg Mountains of Lesotho/South Africa to recreate the “English landscape” in the underwater world, where the gentleman nimrod with fly rod and gun wandered about valleys and streams, which he mastered. In 1905/06, overly-enthusiastic “sporting” trout fishermen were responsible for the introduction of a law prohibiting the catching of any species in the Old Transvaal, South Africa between May and September, depriving rural Africans of protein (Carruthers, 1995), a law which was repealed by 1906 for certain indigenous fish species (Carruthers, 1995).

Black “largemouth” bass (*Micropterus salmoides*) was introduced to Lake Naivasha about 1929 at the instigation of Dent the Kenya Fish Warden to control the introduced tilapia (*Oreochromis leucostictus* and *Tilapia zilli*) (Parker, 2003;

Malala, Mugo1, Nyang'au, Ojuok, Mwamburi, Obade & Kundu, 2004). Black bass was introduced all over Zimbabwe's and South Africa's farm ponds and reservoirs. The red swamp crawfish (*Procambarus clarkii*) (Parker, 2003; Malala, *et al.*, 2004) was introduced in Lake Naivasha in 1972 by a local farmer, who collected them from a dam at Subukia, where they had been introduced from Kajansi in Uganda. In turn, the introduction of crawfish to Uganda was made by Israeli advisors to the Uganda Fisheries Department as food for Nile perch being reared for pond culture. The Israelis obtained them from Louisiana (Parker, 2003). There appears to be little or no understanding as to the impacts of these exotics on endemic/indigenous fish, invertebrates and plants.

De Moor and Bruton (1988) have shown that in Southern Africa, of the 58 alien and indigenous translocated aquatic animals, 37 are considered detrimental, 3 beneficial and 18 to be equivocal - that is beneficial under certain circumstances and detrimental under others. Of the 55 detrimental and equivocal species, 18 are considered to have had major detrimental impacts on indigenous species and communities. This includes the introduction of sport fish, such as the largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*) and brown trout (*Salmo trutta*) that have all had adverse impacts on indigenous species of fish.

In some instances the introduction of exotic species such as kapenta (*Limnothrissa miodon*) from Lake Tanganyika into the Kariba Reservoir and eventually the Cahora Bassa Reservoir, both on the Zambezi River of Southern Africa, appeared to be positive, taking up the void in a biological niche of an open lake phytoplankton feeder. This niche had not existed previously, but was artificially created by man as a result of damming this river. This has resulted in the development of major fisheries and a major protein source for the poor of Southern Africa. Was it luck, that there were no biological catastrophes

(extinctions) or was this carefully studied prior to the introduction of this species? This will be discussed more under Chapter 7 on dams (see Chapter 7, Section 7.8.5.3, Kariba Dam, Zimbabwe, Zambezi River and Section 7.8.5.4, Cahora Bassa Reservoir, Mozambique). As Graham Child (1995) explains,

“while Zimbabwean specialists continued to debate the desirability of introducing exotic fish to a man-made environment, their Zambian counterparts got on the job. An initial inoculation near Sinazongwe, midway up the Zambian shore of the lake (Kariba) in December 1966 was followed by others in 1967 and 1968 until a total of 360,000 fry had been released”.

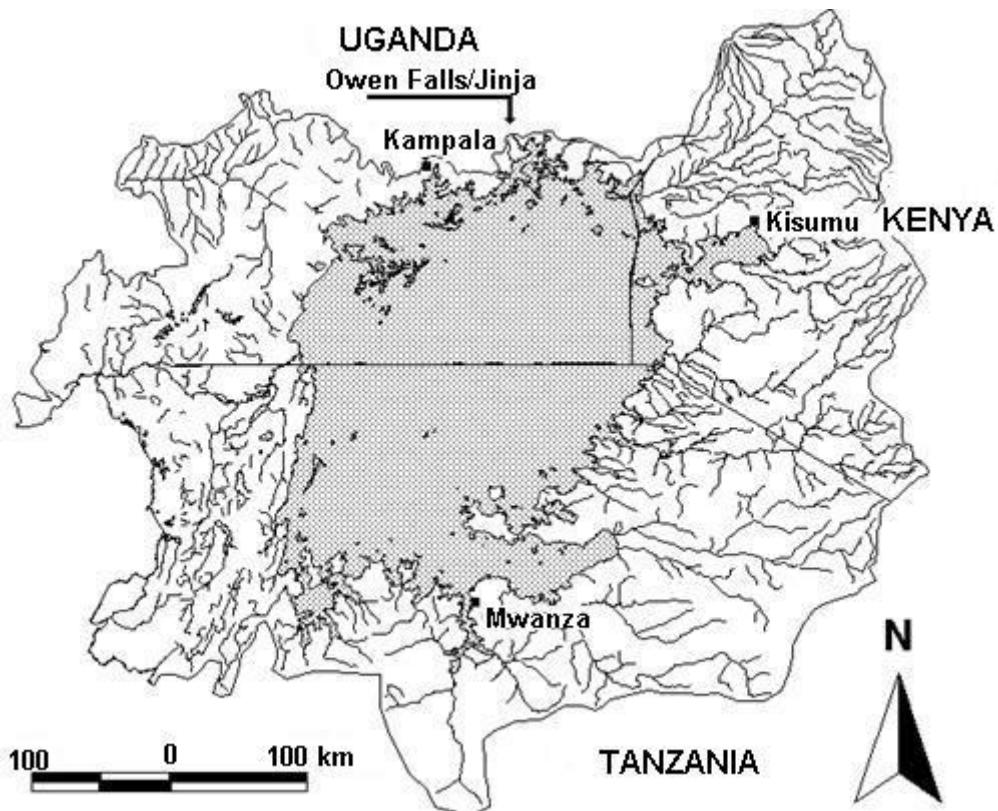
Two examples of colonial and post-colonial impacts on aquatic biodiversity and fisheries will be examined in some detail:

- **Lakes Victoria/Kyoga in the Rift Valley and**
- **Ankazomborona and Marovoay Fokotany, Mahajanga Faritany (Province), Madagascar**

The 69,000 km² Lake Victoria is the second biggest lake in the world⁴⁵, the same size as Ireland. At a human density of over 100/km², nearly 25 million people reside within the Lake Victoria Basin, one of the densest and poorest rural populations in the world. Much of the watershed has been converted to agricultural lands (Figure 4.1) (Odada, Olago, Kulindwa, Ntiba & Wandiga, 2004). However, it is relatively shallow, with a maximum depth of 84 m and a mean depth of just 40 m (Goulding, 1997), a shoreline of 3,450 km and a drainage basin covering an area of 263,000 km² (Mutunga, 2002). It is shared between three countries; Tanzania possessing 49%, Uganda 45% and Kenya 6% of the lake (Owino, 1999; Mutunga, 2002). The Lake Victoria Fisheries directly employs 100,000 people and 2 million indirectly (Mutunga, 2002).

⁴⁵ Lake Superior, North America is the largest

Approximately 90% of the fish catch from Ugandan waters in 1988 consisted of two major groups of fish; the Nile perch (*Lates niloticus*) and various species of tilapia. The dominant tilapia from Lakes Victoria and Kyoga is the Nile tilapia (*Oreochromis niloticus* or *Tilapia nilotica* or *Sarotherodon niloticus*) (DeGeorges, 1991a). This has not always been the case.



Source: Klohn and Andjelic (2002) with permission, United Nations (UN) & UN Food and Agricultural Organization (FAO).

Figure 4.1: Lake Victoria and its catchment

An important freshwater fishery and wetlands are located in the *faritany* (province) of Mahajanga, approximately 560 km northwest of Madagascar's capital Antananarivo, where two fishing sites near the *fokotanys* (villages) of Ankazomborona and Marovoay were visited by the principle author as part of a joint Malagasy/U.S. Agency for International Development (USAID) team.

Additionally, the Fokotany of Ambato-Boeni in the adjoining *fivondronana* (prefecture – next level of local government) of Ambato-Beni was visited.

4.2 BACKGROUND

4.2.1 Lakes Victoria and Kyoga

The rate of speciation of cichlid fish in Lake Victoria was so rapid that the terms “evolutionary avalanche”, “explosive evolution” and “explosive speciation” have been used to describe the phenomena, resulting in the evolution of 13 families of fish in Lake Victoria divided into six cichlid and 15 non-cichlid genera, 51 non-cichlid species and over 350 cichlid species (Okeyo-Owuor, 1999).

In 1908, local fishermen first adopted factory-made nets, with the first large scale commercial fishing boom taking place from 1917-20. By 1940, there were 5 million pieces/year of the indigenous cichlid *Tilapia O. esculentus* (*ngege*) being trans-shipped by rail from Kisumu into central Kenya (Gibbon, 1997).

Prior to the introduction of the Nile perch, the haplochrome cichlids comprised at least 80% of the ichthyomass of Lake Victoria. The haplochromes were classified into 11 trophic groups dominated by detritivores and phytoplanktivores (Balirwa, 1990 In: DeGeorges, 1991a). While the bulk of the lake's biomass in the 20th century was comprised of the little-exported *Haplochromis spp.* (*furu*), and while there were commercial fisheries for *Bagrus spp.* (*hongwe*), *Labeo spp.* (*ningu*), *Clarias (Clarias) spp.* (*mumi*) and one or two other species, the main commercial fishery until the 1980s was always for *Tilapia spp.*

Ngege was never a prolific breeder and its main feeding grounds (waters at a depth of 4-20 m with a grassy floor) were easily accessible by canoe. It is

therefore not surprising that from a very early date concerns were raised about over-fishing this species.

In Kenyan waters, where nylon nets and outboard motors were introduced, inshore catches fell rapidly after 1945. An increasing movement of fisheries to camps on offshore islands was reported and in 1956 the net size regulation (mesh >5 inches) was abandoned as unenforceable (Gibbon, 1997).

4.2.2 Madagascar

Based on a 1963, study there were 165,000 ha of major lakes/impoundments in Madagascar where fishing was important and 400,000 ha of minor or secondary lakes/impoundments where there were no fishermen and/or fishing was for auto-consumption (Razafimahaleo, *pers. comm. In: DeGeorges, 1991b.*).

Marovoay was the second most important region for rice production in the country after Lac Alaotra. Many rice farmers in the area undertook fishing to supplement their income and to procure a source of protein to nourish their families. Fishing habitat included natural floodplains (temporary lakes), rice paddies and impoundments established for rice irrigation.

4.2.2.1 Floodplain fishing

Natural flooding of both irrigated fields and natural floodplains begins in November/December and continues through May of each year. The “natural floodplains” were fished from February through October. There was a direct relationship between the area flooded, duration of flooding, annual fish production, fish biomass and thus potential annual yield/catch of fish. For instance in 1991, fish yields dropped by 67% (2/3^{rds}), due to reduced flooding

(DeGeorges, 1991b). The relationship on the floodplains between dry season forage habitat for livestock and wet season fishing habitat was ecologically complementary, each contributing to the productivity of the other by recycling organic matter and nutrients. The degree of productivity of both terrestrial and aquatic floodplain systems is interdependent and symbiotic in nature (Rajonson, DeGeorges & Booth, 1991).

One advantage of the floodplain fisheries is that their rejuvenation depended on species that found refuge by returning to the major river channel and streambeds during the flood recession. The remainder of the fish became trapped in mostly temporary marshes or ponded areas, *lac tarrisables*. By the end of the dry season, most of these temporary ponds dried up and the trapped fish stocks died unless fished out completely (Rajonson, *et al.*, 1991).

4.2.2.2 Impoundment fishing

In the study area, impoundment fishing behind the dam took place during the rice culture season from May to December (DeGeorges, 1991b; Rajonson, *et al.*, 1991). There were three impoundments totaling about 3,000 hectares in surface area (Rajonson, *et al.*, 1991):

:

- Lac Amboromalandy, approximately 1,000 ha
- Lac Ambilovilo, slightly less than 1,000 ha
- Lac Morafeno, slightly less than 1,000 ha

These impoundments were created in 1950 and managed by a state run organization, FIFABE (*Fikambanana Fampanddrosoana ny Lemak'I Betsiboka*), that operated rice irrigation. Though originally intended primarily for irrigation,

as exploitable populations developed, fishing became a major, although still secondary source of income.

4.1.2.3 Rice paddy fishing

Fishing took place from January through about July in the rice fields. Flooded irrigation fields were fished first. As water receded from the fields, they were prepared for agricultural uses (Rajonson, *et al.*, 1991).

4.3 INTRODUCTION OF EXOTICS

4.3.1 Lake Victoria

The Nile perch and Nile tilapia were both introduced from the Lake Albert/Nile system. The Nile perch, also known as *capitaine*, *mputa*, *sangara*, and *mkombozi* (saviour) was introduced into Lake Kyoga in the 1950s and into Lake Victoria in the 1960s by expatriate “experts”.

Scientists opposed this, fearing that the lack of a natural predator for the Nile perch would result in the imminent destruction of the lake’s bountiful ecosystem. Despite the controversy, a colonial fisheries officer was ordered to clandestinely put the Nile perch into a portion of Lake Victoria lying within Uganda’s territory. Thereafter, it was introduced intentionally in both 1962 and 1963. By 1964, the Nile perch was recorded in Tanzania, by 1970 it was well established in Kenya, and by the early 1980s it was abundant throughout Uganda, Tanzania, and Kenya, the three countries surrounding Lake Victoria (DeGeorges, 1991a). Having no natural predators in the lake and a plethora of food, the Nile perch flourished, often reaching up to 250 kg., and eating constantly to sustain itself (TED, 2000).

The Nile tilapia was introduced in the 1950s (Reynolds & Ssali, 1990). Other tilapines introduced at about the same time as a means of increasing fishery yields include *Oreochromis leucostictus* (Ogari, 1990 In: DeGeorges, 1991a; Okeyo-Owuor, 1999), *Tilapia zilli*, *T. rendalli* (Ogari, 1990 In: DeGeorges, 1991a) and *T. melanopleura* (Okeyo-Owuor, 1999).

4.3.2 Madagascar

Exotic species were introduced largely in the 1950s in an attempt to improve the relatively poor yields from endemic fish species. These include (DeGeorges, 1991b; Rajonson, *et al.*, 1991):

- *Tilapia zilli*;
- *T. mossambica* (*Oreochromis mossambicus*);
- *T. macrochir* (*Oreochromis macrochir*);
- *T. nilotica*;
- Carp argente (Silver carp) *Cyprinus sp.* or hybrids of other carp all introduced directly or indirectly from Asia;
- *Heterotus niloticus*, like the tilapia also introduced from Africa; and
- Two species of freshwater eel, *Anguilla marmorata*, and *Anguilla mossambica* “*Dreta*”.

T. zilli was commonly found in rice paddies. *T. nilotica* and *T. macrochir* dominated the fish catches within the study area. This was compounded by the illegal introduction of a predatory aquarium fish *Fibata* (*Ophicephalus striatus*, Family Channidae, Snakehead) which escaped and which has, like the Nile perch in Lake Victoria, begun to exterminate or greatly reduce fish populations (biodiversity) in most of Madagascar's freshwater lakes (DeGeorges, 1991b).

4.4 SPECIES EXTINCTION

4.4.1 Lake Victoria, Mega-Annihilation of Species

The Nile perch, a prolific predator, is believed to have had a major negative impact on biodiversity in both Lakes Victoria and Kyoga. This was especially the case with *Haplochromis spp.*, of which there were from 150-300 species in Lake Victoria alone (Reynolds & Greboval, 1988; Orach-Meza, 1990; Okeyo-Owuor, 1999; Reynolds & Ssali, *pers. comm.*). The other Rift Valley lakes of Tanganyika and Malawi show similar species diversity. Lake Malawi is estimated to have between 500-1,000 species; many not yet described (Lewis, Reinthal & Trendall, 1986).

An extraordinary spectrum of endemic haplochrome (cichlid) fish, a result of intra-lacustrine adaptive radiation, was reduced by massive species extinctions (ca. 65%) due in part to predation by the Nile perch (Gophen, Ochumba & Kaufman, 1995). It is also believed that the introduction of the Nile tilapia (*O. niloticus*), a larger and more efficient herbivore/omnivore, could have contributed to the competitive elimination or diminution of many haplochrome species (Balirwa, 1990 *In: DeGeorges, 1991a*).

The haplochromes, while ecologically significant, were never of great importance as an economic or as a food source, being the least popular as a food source. Sun-dried, they were believed to have curative properties against measles when consumed by children (Reynolds & Greboval, 1988).

Additional species whose numbers decreased due to the voracious Nile perch in Lake Kyoga include *Protopterus sp.*, *Protopterus spp.*, *Schilbe sp.*, which became rare, and *Oreochromis esculentus (ngege)*, *O. variabilis*, and *Bagrus docmac*,

which disappeared (Reynolds & Greboval, 1988). The predatory bagrus, clarius and schilbe species may have been displaced due to intra-specific competition with the predatory Nile perch (Ogari, 1990 *In:* DeGeorges, 1991a). Over-fishing and the introduction of tilapine fish into Lake Kyoga are also believed to have contributed to the decline in endemic fish (Reynolds & Greboval, 1988). For instance, the disappearance of *O. esculentus* (*ngege*) and *O. variabilis* is believed to have taken place due to hybridization with *O. niloticus* (Ogari, 1990 *In:* DeGeorges, 1991a). Similar trends in the decline in fish species biodiversity have been seen in Lake Victoria (Ssali, *pers. comm.*).

4.4.2 Madagascar

It appears that for the most part, endemic species had been displaced or eliminated by the introduced exotics, with approximately 95-99% of the fish catches in the study area, by both numbers and biomass, being exotics. This is typical of most freshwater fish stocks throughout Madagascar (Rajonson, *et al.*, 1991). The principal endemic/indigenous species taken from the rice fields and floodplains included:

- *Arius madagascariensis*, an endemic catfish;
- *Megalops cyprinoides*, an indigenous tarpon that does not exceed 55 cm in length; and
- An endemic gobidae.

4.5 EUTROPHICATION

4.5.1 Lake Victoria

Hydrologically, Lake Victoria behaves like a closed system, taking about 73 years for a volume of water equivalent to that of the Lake, to flow out of it (Klohn & Andjelic, 2002). There are substantial increases in the chlorophyll concentration (indication of increased algal biomass) and primary productivity compared to values measured 30 years ago, with a shift in the phytoplankton community towards dominance of blue-greens and an enhancement of algal blooms. In some shallow depths of the lake, anoxic (without oxygen) waters have recently been found, suggesting significant increases of oxygen demand in the seasonally formed hypolimnion.⁴⁶ It is believed that (1) predation by the Nile perch on the native cichlid fish fauna has altered the food web and caused a trophic cascade, (2) increased nutrient inputs from the catchment or the atmosphere have resulted in the observed eutrophication, and (3) modifications in the stratification and mixing regimes of the lake brought about by climate change could be involved in the eutrophication of the lake and are not considered mutually exclusive (Okeyo-Owuor, 1999).

The decrease in the number of algae-eating fish allows the algae to grow at an alarming rate, thereby “choking” the lake. The increasing amounts of algae, in turn, increase the amount of detritus (dead plant material) that falls to the deeper portions of the lake before decomposing. As a byproduct of this decomposition, the oxygen levels in the deeper layers of water are being depleted. Without oxygen, any aerobic life (such as fish) cannot exist in the deeper portions of the

⁴⁶A rapid change in temperature with depth of 1° C or greater indicates a thermocline and the division between the upper waters of a lake (epilimnion) where circulation by wind is excellent and the hypolimnion in the lower waters of the lake where circulation is poor and often leads to anoxic conditions if there are large amounts of organic matter in the lower waters. Most tropical lakes are monomictic, turning over once a year as surface temperatures cool to hypolimnion levels.

lake, forcing all life to exist within a narrow range of depth. In this way, the Nile perch has contributed to degradation of the diverse and thriving ecosystem that was once Lake Victoria (TED, 2000).

Increased nutrient loading is also contributing to this eutrophication, even though fertilizer use is limited, from soil particles washed off the land by erosion, from burning wood-fuels, and from human and animal waste originating from both rural and urban areas draining into the lake (Klohn & Andjelic, 2002). The Lake Victoria Environment Management Program estimates 49,500 tons of nitrogen/year and 5,700 tons of phosphorous/year are loaded into the lake from non-point sources (Alweny, 2007).

4.5.2 Madagascar

With little or no baseline fishery statistical data, it was impossible to determine to what degree fish catches were changing either in yields, catches per-unit-effort or in species composition. However, a number of activities underway may have been contributing to the long-term degradation of these aquatic ecosystems, both environmentally and from the standpoint of a renewable fishery resource of important economic value.

There had been a major influx in the numbers of farmers undertaking rainfed agriculture for corn, manioc and sugarcane within the watershed of the impoundments and floodplains. Because of a scarcity of farmlands, forests of raphia palm were being cut over. This was resulting in the silting-in of impoundments and the temporary floodplain lakes, reducing their water storage capacity and their capacity as important habitat for fish production.

Because the reservoir storage capacity of the impoundments had been reduced, the increasingly rapid loss of water from the watershed during the rainy season could not be completely stored by the impoundments. As a result, this water overflowed onto the floodplains and was lost as a resource for rice irrigation.

Likewise, the loss of water retention capacity from deforestation greatly reduced critical dry season flows from the streams that fed the impoundments, resulting in insufficient water from the impoundments (e.g., Lac Amboromalandy) to meet the full water requirements for dry season irrigation. In one instance farmers had to pump water onto their fields, something they could ill afford.

Although not confirmed through interviews with local residents, fishery production within the lake was believed to be decreasing due to shrinking habitat from sedimentation and because sedimentation was probably covering over the nests of breeding tilapia, among other species. Breeding took place at the height of the rainy season and at the peak period of erosion. Secondary impacts included sedimentation beginning to fill in irrigation canals and fields. This was not unique to the case study village, but appears to be happening in the area of Ambato-Beni as the result of watershed degradation.

According to the *Eaux et Forêts* agent responsible for the Conservation and Development Project at Ankarafantsika, there was a major effort underway to keep the watershed of the all important Marovoay rice producing areas in protected forest cover. What is not known is to what degree the community was actively participating in this effort (Rajonson, *et al.*, 1991).

4.6 ADAPTATION

4.6.1 Lake Victoria

While many experts were afraid that the Nile perch would eat itself out of existence, after eating haplochromes to extinction in Lake Victoria, its diet changed to the more abundant freshwater shrimp, *Caridina sp.*, and a small pelagic zooplanktiverous cyprinid fish, (*dagaa*) *Rastrineobola argentea*, believed to be an under-exploited fishery.

The increase in biomass of *Caridina sp.* and *R. argentea* along with increased algal blooms (also potentially related to increased nutrient pollution associated with human development of the lake shore) and increased lake fly swarms were believed to be due to a reduction in haplochrome and endemic tilapine stocks that fed on these resources. Thus, ecological balance and the transfer of energy in the food chain were being redirected through these other species (Balirwa, 1990; Kudhongania, 1990 both *In: DeGeorges, 1991a*).

4.7 CHANGES IN MAKE-UP OF CATCH COMPONENT

4.7.1 Lake Victoria

From being a multi-species fishery, Lake Victoria became a “three species fishery”. Nile perch being the dominant species comprising 55% of the catch, with 33% of the catch consisting of *dagaa* (*Rastrineobola argentea*) - a small sardine like fish, - while various species of tilapia, mainly *Oreochromis niloticus* (Nile Tilapia), constituted about 10% of the catch. These three species, during the last years, have made up about 98% of the total catch in the lake. In the Kenyan part of the lake, it may be more correct to talk about a “two-species” fishery. In

1995 about 91.5% of the catch consisted of the combination of Nile perch comprising 47.2% and *dagaa* constituting 44.3% (Jansen, Abila & Owino, 1999).

4.7.2 Madagascar

See above. Since the introduction of exotics in the 1950s, exotics make up 95-99% of the fish catches by both weight and numbers (Rajonson, *et al.*, 1991)

4.8 FISH YIELDS WITH EXOTICS

4.8.1 Lakes Victoria and Kyoga

The net result of these actions has resulted in a tremendous increase in fishery yields over the last 25 years and the development of a high quality “white fish” for the export market, turning Nile perch and Nile tilapia into important sources of foreign exchange for Kenya and Uganda (DeGeorges, 1991a).

Prior to introduction of the Nile perch in Lake Kyoga, fish yields were relatively low (e.g., 4,500 metric tons in 1956). After introduction of the perch, they peaked to a high of 138,000 metric tons (MT) in 1982, but declined to 86,748 MT by 1988. This is believed to be due to over-fishing, the use of small mesh gill nets and insecurity (Orach-Meza, Coenen & Reynolds, 1989).

In the Ugandan portion of Lake Victoria the introduction of these exotics resulted in increased fish yields from 50-60,000 metric tons in the late 1970s to 107,092 tons in 1988, the Nile perch alone climbing from an annual yield/catch of less than 1,000 tons in 1981 to 92,000 tons in 1988 (Orach-Meza, *et al.*, 1989). Catch recording is difficult given the dispersed nature of the fishery and landings. Official statistics (without doubt under-recorded) from the three countries

suggested a production of around 383,000 tons of Nile perch in 1994 from Lake Victoria, with 29% landed in Kenya, 27% in Uganda and 44% in Tanzania (Goulding, 1997).

Export utilization of Nile perch catches from Lake Victoria in 1994 (quantities in metric tons) is contained in Table 4.1:

“The Nile perch trade generated an estimated US\$ 140 million/year for the three countries concerned. In the case of Uganda and Tanzania the fish provided major export earnings. The main export markets are Europe, Israel and Australia” (Goulding, 1997). By 2004, the estimated value of the Nile perch export fishery was estimated at US\$ 270 to 520 million/year (Odada, *et al.*, 2004).

Table 4.1: 1994 landings and exportation of Nile perch, Lake Victoria

	Kenya	Uganda	Tanzania	TOTAL
Landings (Metric Tons)	104,000	120,000 ¹	159,000	383,000
Exports (fillets) ² (Metric Tons)	16,493	18,000	13,500	47,993
Exports (live equivalent) (Metric Tons)	49,500	54,000	40,500	144,000
% export utilization	47	45	25	-
Export value (US\$ million)	49.0	53.5	37.9	140.4

Notes: 1) 1995 data; includes about 20,000 tones from sources other than Victoria

2) Assumed average yield is ≈33% of live weight

Source: FAO Fishery statistics in Goulding (1997) with permission, Megapesca.

4.8.2 Madagascar

The only quantitative data obtained was 1 ton/month of dried tilapia per team of 4 fishermen over a four month period caught with seines in impoundments valued at

FMG (Malagasy Franc) 1.8 million (US\$ 1,020)/four fisherman team.⁴⁷ Floodplain yields vary from year to year depending upon the area and duration of flooding (DeGeorges, 1991b).

4.9 SOCIO-ECONOMIC IMPACTS, NEW STAKEHOLDERS

4.9.1 Lake Victoria

With globalization of the fisheries, a new set of actors entered the Lake Victoria fisheries. The owners of the fish export and fishmeal factories, having no prior relationship to the traditional fishing community, are mainly Europeans, Israelis and Asians, who have completely transformed the Lake Victoria Fisheries.

4.9.1.1 Decreasing source of protein for local people

In 1996, factory purchases of fresh Nile perch accounted for probably 75% of all Nile perch caught (Gibbon, 1997). Since the artisanal fishery biomass has moved to the high priced export fishery, there has been a major decrease in less valuable species in both numbers and biomass. These small fish, once important in the diets of local people living along Lake Victoria, are no longer available as a source of protein.

Fish traditionally accounted for about 60% of the animal protein consumed by Ugandans (Ssali, 1990 *In:* DeGeorges, 1991a) and 60% of the dietary protein of lake shore communities in general (Fuggle, 2002). The average consumption of fish in Uganda was 13 kg/person/year (Orach-Meza, 1990 *In:* DeGeorges, 1991a) and was the cheapest source of protein for the average Ugandan based upon 1990 prices. Fish averaged US\$ 0.55/kg, beef averaged US\$ 1.33/kg and chicken US\$

⁴⁷ In 1991 there were FMG 1,765/\$US

2.0/kg (Ssali, 1990 *In:* DeGeorges, 1991a). The rapid globalization and development of an export market has affected the consumers, as evidenced by the present concerns about food security along the lakeshore. The price of whole fish soon was beyond the reach of the middleclass and the remains of the filleted Nile perch skeleton were considered “food for poor people” (Okeyo-Owuor, 1999).

Table fishes [tilapias, catfishes, carps, and lungfish] have declined sharply, with the most important among them, the *ngege* (*Oreochromis esculentus*), extinct but for a few scattered populations in lake basin ponds and reservoirs. Today, the composition and yields of such fish catches are virtually negligible. Extensive fish kills (e.g., from oxygen depletion), Nile perch, loss of habitat, and over-fishing have caused many fisheries to collapse and many protein sources to be unavailable at the market for local consumption (TED, 2000).

Fish that the factories are unable to collect, because of delays in arrival at camps or arrival without adequate supplies of ice, as well as fish, which the factories reject as too small or as “stale”, are processed artisanally for local sale by

“groups of four or five youths pushing *trolli* (hand-carts with axles, wheels and tires cannibalized from pick-ups). Each *trolli* was spilling over with between one and two tons of stinking fish carcasses, bought by traders (also known as *matajiri*) at the factory gates for processing...Clouds of flies swarmed round this site, which could be smelt at some distance away, and above them swarmed quantities of swallows and a variety of hunting birds” (Gibbon, 1997).

With almost all Nile perch above 1 kg going for export, what is left for the local traders and processors? It is mainly the following three types of Nile perch (Jansen, *et al.*, 1999):

- The rejected Nile perch (partly rotten or damaged fish) - according to interviews held with many factories, they reject less than 2% of the fish delivered to them;
- The fingerlings and Nile perch below 1 kg (too small for the factories), which varies between 10-35% of the total catch of Nile perch; and
- The Nile perch skeletons left after the fish has been filleted.

Meanwhile, more and more of the *dagaa* (Jansen, *et al.*, 1999; Bokea & Ikiara, 2000) along with Nile perch skeletons (Bokea & Ikiara, 2000) is going into industrial fishmeal as animal feed, denying these important remaining protein sources for human consumption.

Nutritional surveys carried out by the Kenya Medical Research Institute in some communities next to the lake clearly show that there is severe malnutrition. In the Siaya District, 30-50% of children were found to be moderately to severely malnourished, with 50-70% moderate to severely malnourished in terms of lack of zinc, iron, and vitamin A. Malnutrition-related diseases were rampant. Access to only 10 grams of dried *dagaa* would adequately address the iron, zinc and vitamin A deficiency among the children. Because of the withdrawal of so much Nile perch and *dagaa*, it is estimated that the per capita consumption of fish in Kenya between 1990 and 1996 was reduced from six to three kg/person/year (Jansen, *et al.*, 1999). Protein deficiency (kwashiorkor) is also common among children of lake communities (Bokea & Ikiara, 2000; Fuggle, 2002).

The response to this massive withdrawal of Nile perch from the local population has been that local fishermen have started to target the fingerlings of the Nile perch using non-selective mosquito nets and beach seine gear. From the point of biodiversity loss and having a sustainable production, this practice is clearly damaging. However, from the point of view of the consumers, the targeting of the

juvenile fish may to some extent have compensated for the loss of Nile perch from the local market. Although less than successful, in an attempt to rectify this problem Uganda has imposed a ban on exports of Nile perch exceeding 60,000 tons/year, reserving three quarters of all fish in Ugandan waters for local consumption. Tanzania has prohibited the export of tilapia, reserving it for local consumption (Jansen, *et al.*, 1999), as has Kenya (Josupeit, 2006).

The controversial film “Darwin’s Nightmare” by Hubert Sauper depicts the impacts of globalization on Lake Victoria’s fishery and the socio-economic consequences, Sauper declaring “ ‘I could make the same kind of movie in Sierra Leone, only the fish would be diamonds, in Honduras, bananas, and in Libya, Nigeria, or Angola, crude oil’ ” (Jacquet, 2006).

4.9.1.2 Employment

It has been estimated that during the 1980s an additional 180,000 jobs were created in the primary and secondary fields of the fisheries because of the Nile perch fishery. However, for every work place created in the modern fish export sector, it is estimated that about 6 - 8 workplaces, or potential workplaces, were lost in the traditional sector (Jansen, *et al.*, 1999). Odada, *et al.* (2004) estimate that the number of fishermen in Lake Victoria increased from about 84,000 in 1990/1991 to 122,000 in 2000. Many of these had never been fishermen, moving to cash in on this booming industry (Markussen, 2002; Odada, *et al.*, 2004). This also applies to women fishmongers, who traditionally came from the clans or sub-clans that managed fishing beaches (Markussen, 2002). In addition, “the gap between the richest and poorest fishers in some coastal areas is widening, and the gap between the benefits obtained from the fishery by vessel owners and employed fishermen is also widening” (Nyeko, 2004; Odada, *et al.*, 2004).

4.9.1.3 More wealth among fishermen

There was more wealth in the fishing community in the 1980s and 1990s than in the 1970s, as evidenced by the large number of bars, restaurants and shops, which have been established on the landing sites. The increased income has also contributed to create new employment opportunities for people who serve or sell goods to the fishermen.

Canoe ownership went from owner-operated in the 1970s to middleman-owned by wealthy outsiders looking to capitalize on the economic boom in the 1980s/90s. The fishing operations were still quite labor-intensive, using traditional sails and oars as a means of propulsion. Each boat required from two to six men for its operation. Thus for local communities, the Nile perch fishery had many positive features: Some fishermen increased their earnings manifold, while others who had been unemployed or under-employed obtained jobs as crew (Jansen, *et al.*, 1999).

4.9.1.4 Introduction of trawlers

In the 1980s as competition increased among fish processing plants, many operating at only 50% capacity, many factories acquired trawlers. Each trawler could deliver large quantities (500-1,500 kg) of fresh and undamaged fish/day at major landing points served by the insulated trucks of the factories.

For each workplace created in a trawler, seven to eight work places in the traditional harvesting sector of the fishery were destroyed. The trawlers also had adverse impacts on the ecological habitat of the lake and the destruction of local fishermen's gear. During the last few years, all the three governments of East

Africa banned trawling, though it still continues, particularly in Kenya, where 10-15 trawlers were in operation in the late 1990s (Jansen, *et al.*, 1999).

4.9.1.5 Impacts from introduction of *tembea* boat fishing

Introduced in Uganda in the mid-1990, a new technique of fishing is fast developing across Lake Victoria called *tembea* (Swahili: moving, drifting). *Tembea* fishing is done with a large *Sese* canoe, having a flat stern end to which an outboard engine is fitted. The boats operate up to 100 double gill nets with a mesh size between 15.2-22.9 cm (six to nine inches). The nets are set drifting in the evenings and hauled in the morning catching up to 1,200 kg/day. With increasing numbers of *tembea* boats, the catch has dropped significantly, but is still often five to ten times higher than the catch obtained by traditional boats (Jansen, *et al.*, 1999).

While the *tembea* boat employs on average three to five people, one more person than the traditional canoes, the catch is many times higher, resulting in displacement of labor. Many traditional fishing boats were pulled onshore or had moved to more distant and minor beaches, used only for very local subsistence fishing. Many of the people employed on traditional boats lost their jobs. Many tried, but few succeeded in obtaining employment on the *tembea* boats (Jansen, *et al.*, 1999).

The ownership structure of the fleet was radically shifted to rich people, investing up to US\$ 8,403 (Kshs 600,000) in each fishing unit, coming from other businesses such as transport and hotels (Jansen, *et al.*, 1999).

Like the trawlers, *tembea* boats are, in contrast to the traditional boats, able to supply large amounts of fresh fish to the factories, offering a higher quality than

the fish landed by the slow moving sailing boats. The *tembea* boats fish as a fleet and when the catch goes down in one area, the fleet moves to another beach, completely undermining the operations of locally based traditional boats by over-fishing their grounds and destroying their gear. The *tembea* boats sell through the local fishing cooperatives, pay a 10% commission to the coop on the price they receive, hire the relatives of important people, and take care of the chiefs and government fish scouts, thus aligning themselves with the local elites and the government representatives by buying themselves “protection”. Crime and piracy of gear and motors of *tembea* fishing boats are on the rise, many of the “pirates” said to be traditional fishermen put out of business (Jansen, *et al.*, 1999).

4.9.1.6.1 Impacts on women from globalization of the fishery

The traditional fishmongers, the majority of whom are women, and their close relations with fishermen are now being severed, as the fishermen contract to deliver to the processing agents with better prices (Okeyo-Owuor, 1999). Lately many women, having accumulated capital from work in the processing and trading sector, have decided to invest in boats and gear. Some women own and manage the fishing operations of small canoe fleets (Jansen, *et al.*, 1999).

4.9.2 Madagascar

The majority of fishermen appeared to consist of professional migrants with local part-time fishermen working under them as field hands. There were about 200 fishermen including locals and immigrants. They rented *pirogues* from farmers at US\$ 167-222 (30-40,000 FMG)/month/metal boat and US\$ 84 (15,000 FMG)/month/wooden boat.

Not having access to credit, the average local fisherman could not afford to lay out the one time cash payment for a net (e.g., a 10 meter seine, 2.5 meters deep, with 2.5 cm mesh made from #6 line costs US\$ 833/150,000 FMG) and thus became a field hand for the professional migrants (Rajonson, *et al.*, 1991).

4.9.2.1 Splitting the profits

As field laborers for the professional fishing owners of the nets, the local fishermen only gained a very small percentage of the real value of the fish catch. Traditionally, 50% (1/2) of the catch went to the owner of the net. The other half (50%) of the catch was split up by the fishermen, in many cases the owner being one of the three to four fishermen. It was estimated that the owner of the net could pay off a net in 15-20 days of fishing. Thus, his inability to access credit keeps the local part-time fishermen from attaining economic independence and from realizing the real value of the resource. This problem was identified as a major issue in the three villages of the study area (Rajonson, *et al.*, 1991).

4.9.2.2 Sex and age stratification

Seines with 2.5 cm mesh were the principal fishing gear used in the freshwater areas described during this case study. Cast nets (*epervier*) were of secondary importance. Fish traps were placed in irrigation canals and likely small narrow streams. While commercial artisanal fishing was a man's activity, hook and line on raphia palm cane poles was used by women and children to catch fish for personal consumption (Rajonson, *et al.*, 1991).

4.9.2.3 Conflicts

There were major conflicts between using the freshwater impoundments for the irrigation of rice and as a fishery resource. The installation of temporary fishing homes around the impoundments and rice paddies by migratory fishermen resulted in the following conflicts with rice farmers:

- The impoundment water was being polluted as a potable water source for downstream farmers working in the rice paddies;
- The fishermen were decreasing water available for rice irrigation by opening sluice gates in impoundments to decrease water volume and increase fish concentrations, thus increasing catchability; and
- Temporary houses placed by fishermen on dikes, and fish traps placed in canals and not removed at the end of the fishing season eventually blocked outflows from dam to irrigation canals leading to rice paddies.

In order to resolve this conflict, a meeting took place in 1990 with the fishermen (both migrants and fishermen/farmers), the *fokotany*, *Eaux et Forets* and FIFABE. It was recommended that fishing in impoundments be put off until October, after the rice harvest. While this was agreed to, some fishermen, without permission, had begun fishing in the impoundments (Rajonson, *et al.*, 1991).

4.10 FISHERY MANAGEMENT

4.10.1 Lake Victoria

The presence of a centralized management system dates back to the colonial period when the first institutions were set up to manage the fisheries and the first formal fisheries regulations were adopted. An important institution was The Lake

Victoria Fisheries Service, which was established in 1947. Although government institutions had been established to manage the fisheries and assist the fishermen, these institutions played a rather insignificant role up to the early 1970s. In the 1960s and 1970s, the government-employed “fish scouts” played a positive role in the management of the fisheries alongside and in cooperation with the traditional clan elders. A rather detailed description of traditional fishery management on Lake Victoria is contained in Chapter 2 of this book (Section 2.2, TRADITIONAL FISHERIES MANAGEMENT) (Owino, 1999).

To cope with the dramatic changes, which occurred in the Lake Victoria fisheries as described above, the Government of Kenya adopted a new Fisheries Act in 1989, which was revised in 1991. The Act has greatly affected local community participation in the management of the fisheries. At the local level, in the fishing villages (beaches), the government fish scout implements rules and regulations of the Fisheries Act. Fishermen caught using illegal nets have been threatened and intimidated by fish scouts demanding bribes from the fishermen in exchange for their confiscated nets. About 20-30 years ago, the real wage of the fish scouts was much higher than today and with a richer fishery than in the 1970s, the temptation to augment one’s salary by questionable methods has increased (Owino, 1999).

Today, many fishermen interviewed felt that the responsibility of managing the fisheries has been taken away from them (Owino, 1999; Mutunga, 2002). “We no longer own the lake. We are only expected to fish and go away since it is the role of the Government to manage the lake” (Owino, 1999)

What was a “Common Property Resource” has now become an “Open Access Resource” with illegal mesh sizes catching under-sized fish, fishing in spawning and nursery grounds, trawlers are fishing inshore closer than the five nautical mile

limit, there no longer being limits on licenses for fishing canoes as a way of controlling fishing effort, and the role of the beach committee, previously made up of elders in regulating the fisheries in a co-management effort with government, having been eroded (Owino, 1999).

“Ultimately, the unrestricted access status of the lake and lack of enforcement of existing legislation are linked to increasing and crippling fishing effort...Overfishing and the use of damaging or illegal fishing gear is only in part a reflection of the failure of centralized management strategies on the lake, and are symptomatic of broader social, economic, and developmental dislocations such as poverty, lack of employment, etc. Theft (of fishing gears, vessels, etc.) and piracy are rampant on the lake, and may become worse as the disparity in distribution of benefits from the fishery becomes more polarized” (Odada, *et al.*, 2004).

In trying to get back control over their fishery, an elder head of the beach committee of Tako Bay organized a vigilante group to patrol the waters and protect the area from illegal fishing between 1984 and 1993 (Owino, 1999).

The fishery scouts did not like this, as it prevented them from taking bribes from illegal fishermen, ordering the withdrawal of the vigilante group (Owino, 1999). Local fishermen no longer feel responsible towards the lake, having been undermined by corrupt government fisheries officials colluding with unscrupulous fishermen to plunder the fisheries’ resources (Mutunga, 2002). The government officials argued that according to the Fisheries Act, it is the government’s responsibility to protect fish spawning and breeding grounds and that the beach leader and his vigilante had no *locus standi* i.e. the rights recognized in law (Fisheries Act) to protect the fisheries (Owino, 1999).

4.10.2 Madagascar

Traditional community controls over fishery and other wetland resources existed but were lost during colonialization and the extension of colonial laws during post-independence until today. The major organization in the study area was the state owned FIFABE, which was established in 1953 to operate the three freshwater impoundments and expand paddy rice. It had become a major mediator in resolving conflicts between using the impoundments for both fishing and irrigation water storage. In the area of the case study, the fishery resources appeared to be a Common Pool Resource available to anyone in the community who wished access. It fell somewhere between an unmanaged "Open Access Resource" and a community managed "Common Property Resource".

While jointly, the local government at the level of *fokotany* (Village) and *Eaux et Forêts* controlled access to area fisheries, little or no control existed over-fishing effort or gear, both of which can have a major impact on the sustainability of fishery stocks, especially in the impoundments. The mesh size limitation for all fishing gear used in permanent water bodies, including the three impoundments in this case study, were not to be inferior to 4 cm (stretched) for seines and 3 cm (stretched) for cast nets. While legal for floodplain exploitation, where ponds needed to be fished out before they dried up, illegal seines of 2.5 cm mesh (stretched) were commonly used by everyone in the region, even on permanent lakes, with the risk of fishing out the impoundments of viable exploitable stocks. Since the number of nets and the number of fishermen were also not regulated, there was no control over-fishing pressure and the sustainability of the fishery (Rajonson, *et al.*, 1991).

There was no national law governing the opening and closing of the fishing seasons. Each local government determined when to open and to close fishing seasons

according to their own criteria such as water level and reproductive season of local fish species. In the Faritany of Mahajanga, the official season for inland fisheries was from July through October. There was also a closed fishing season corresponding to the major period of reproduction and growth, and floodplain inundation from December through March of each year. However, fishing throughout the region began as early as January during the reproductive period or before many fish (especially tilapia) had a chance to grow more than a few inches diminishing the potential economic value of this resource. Fishing during the locally closed reproductive season (December-March), risked fishing out the reproductive stocks before they had a chance to produce a new recruitment of juveniles. This was especially critical in the impoundments (Rajonson, *et al.*, 1991).

4.11 THE FUTURE

4.11.1 Lake Victoria

There is strong evidence that the Nile perch is being over-fished. First reports of declining unit catches in the Tanzanian section of the lake date exist from 1994 (Gibbon, 1997). The average size of landed fish has declined from over 50 kg in 1980 to less than 10 kg in 1996. Catch rates are also reported to be in decline (Goulding, 1997). “By 1998, total Nile perch catches were half those at the beginning of the decade despite increased effort, and catches of *dagaa* (*Rastrineobola argentea*) have also leveled off despite increased effort” (Odada *et al.*, 2004). The population of Nile perch in the total biomass of the lake is down from 90% in 1980 to less than 50% in 2005 (Josupeit, 2006). Odada, *et al.* (2004) place the cause of declining yields to a variety of factors from watershed degradation, pollution, improved technologies (20-30% contribution), and increased fishing effort encouraged from competition by the large number of under-supplied fish factories in an era of declining fish catches and fish stocks. There are 11 fish

factories in Uganda, 12 in Kenya and 12 in Tanzania. To this, one must add the modified lake trophic status from introduction of the Nile perch and Nile tilapia, and in recent times the record low lake levels (Josupeit, 2006) due to decreased rainfall and over-release of water for hydropower (see Chapter 13, Section 13.11.1.3, Nile Basin Initiative [NBI]). Fisheries scientists believe that the Nile perch fishery is being sustained only by cannibalism of the young fish. The future sustainability of the fishery will depend on a reduced volume of catch, with better economic utilization through the sale of higher value export products to niche markets combined with improved environmental management to ensure that the lake ecosystem achieves stability (Goulding, 1997). On the positive side, with the drastic decline in the Nile perch stock, there has been a “re-emergence of indigenous fish varieties such as catfish, mudfish and lungfish”, and some *Haplochromis* species thought to be extinct have reappeared. Already a number of fish factories along the lake have closed down (Josupeit, 2006).

4.11.2 Madagascar

Fishermen and *fokotany* executive members felt that if given an opportunity to control effort, the local fishermen could advise local decision makers and *Eaux et Forêts* or fishery agents on such fishery management issues in order to sustainably manage this resource. This was believed to be a critical step in managing impoundment and permanent lake fisheries (Rajonson, *et al.*, 1991).

4.12 CONCLUSION

As has been the case all over the world, the introduction of exotic species has resulted in major extinctions and/or reduction of indigenous/endemic species in Sub-Saharan Africa. In the case of fish, this was undertaken to increase production and/or to recreate the European landscape (e.g., trout) in Africa where the English nimrod with

fly rod and gun could traipse through Africa's "hill and dale", only instead of kicking up a stag in the Abadares of Kenya, it might have been a reedbuck or lion. In many cases, the commercialization of fish brought in outsiders who displaced artisanal fishermen, forcing them to work as hired hands, to move into another vocation and sometimes into conflict. In some cases, the extinction of traditional species used for food, because of the introduction of exotic species and/or because of its commercial export, has resulted in people being worse off nutritionally. Loss of traditional management controls through centralization in the hands of government has, as with wildlife and forests, created "Open Access Resources", often being mined through mismanagement by corrupt government officials and outsiders, risking to cause a collapse in these fisheries. As with terrestrial resources, a major step forward must be to re-empower fisher communities to manage their fisheries and wetlands, by dividing lake/reservoir shores into community controlled management units with geographically defined boundaries. Within these areas, communities can control fishing effort (e.g. number of canoes/nets), mesh size, establish nursery areas and control access by outsiders. According to Bokea and Ikiara (2000), Nyeko (2004) and Ong'ang'a (2006) a proposed beach co-management system between government and fishing communities is being considered for Lake Victoria.

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Chapter 5

5.0 AGRICULTURE IN SUB-SAHARAN AFRICA (SSA) SINCE COLONIALIZATION

“Africa could grow enough food for two or three times its population. It could have more wild protein, fish and livestock than it can eat or sell. And its people could be flourishing. Africa was most likely Eden, where man began. It was never a lush garden of food for the taking. Soils were mostly poor, and life was fraught with disease and danger. But there was a great wealth and potential. In less than a century, at a steadily increasing pace, Eden has been squandered recklessly. Today, much of it teeters at the edge” (Rosenblum & Williamson, 1990).

“The only answer to food security is to concentrate on the dozen or so countries (in Africa) that can produce food (commercially) and then find a way to distribute it within Africa. But if I said that in public, American farmers will kill me”, (USAID official *In*: Rosenblum & Williamson, 1990).

“Agricultural-led development is fundamental to cutting hunger, reducing poverty (70% of which is in rural areas), generating economic growth, reducing the burden of food imports and opening the way to an expansion of exports” (NEPAD, 2002).

“Africa faces two major challenges. The first is to ensure that its natural resources serve as the basis for economic growth that will result in more active and sustainable participation in the global economy. The second is to ameliorate the degradation of the natural resources and erosion of biodiversity in order to improve systems' resilience. These challenges are made all the more daunting by the fact that it is not sufficient to simply stop the degradation. Consistent efforts must be made in the short- to medium-term to build up the resources to levels never before attained in order to meet the demands of a population growing at more than 3% a year” (NEPAD, 2002).

5.1 INTRODUCTION

Often thought of as tropical, approximately 70-75% of the Sub-Saharan African continent lies within the savanna biome (Figure 5.1) (see Section 5.9.4.7, Deforestation in savanna environments). “Tropical Africa”, that is Africa South of the Sahara, is 33% savanna and 40% desert or steppe (Martin & O’Meara, 1995), leaving about 27% as forest/other vegetation (Martin & O’Meara, 1995; FAO, 2000a). Savannas are one of the world’s major biomes and in Africa contain the majority of the mega-fauna. Savanna is a tropical vegetation type co-dominated by woody plants and grasses and includes arid shrub lands, lightly wooded grasslands, deciduous woodlands and dry forests; tree canopy varying from 5-90% (Scholes, 1997 *In:* Cowling, Richardson & Pierce, 1997). If the transition ecotomes between are included, then savannas can be defined as constituting up to 70-75% of the habitat south of the Sahara (Sub-Saharan Africa), the figure (75%) used by Child (1995; 2004b both *In:* Child, 2004a):

- 1) Between savannas and forests, and between savannas and grasslands/arid shrub lands [e.g., Sahel, Northeast Arid Region (Somalia and parts of Ethiopia) and the Southwest Arid Region (Nama-Karoo and Succulent Karoo of Northern Cape and the Kalahari of Namibia and Botswana)], and
- 2) Miombo (*Brachystegia* spp.) and mopane (*Colophospermum mopane*) woodlands (Tropical deciduous scrub), which some might classify as forests but which are really savannas.

Child (2004b *In:* Child, 2004a) states:

“these savannas...where crop and livestock production, on a broad scale without irrigation are economically hazardous and faltering. Put bluntly, conventional agriculture is not sustainable in vast areas of these savannas under present or foreseeable international

production and marketing conditions...compounded by deteriorating terms of trade for ubiquitous agricultural commodities like red meat or cereals...By contrast, the value of the spectacular African macrofauna...is increasing as demand for wildlife-based activities escalates".

Many people talk of desertification and climate change causing the Sahara to move southward. As is discussed below and in the next chapter, in the mid-19th and 20th centuries, ill-advised agricultural policies, the introduction of inappropriate farming and animal husbandry practices, boreholes, over-grazing and the destruction of indigenous agricultural systems that had achieved a delicate ecological balance through generations all resulted in increased soil erosion and climate change. The net result was creation of what many believe to be man-made desertification. The development policies of governments, often designed, funded and staffed by international donor agencies, all too frequently have exacerbated the problem through ill-advised actions (Martin & O'Meara, 1995) and policies. This linked to a human and livestock population explosion in the 20th century that can be tied to colonialism, has spelt catastrophe for agriculture, the people and the environment across the subcontinent.

5.2 ECONOMICS OF AGRICULTURE IN AFRICA

The majority of poor in Africa are smallholders. Over 96% of farmers operate on a small-scale, farming less than five ha (Roman, 2003). The sector, however, is characterized by weak linkages to markets and little or no access to external inputs. Many small-scale farmers farm already degraded land (and/or marginal land that will soon be degraded), and most are far from services and roads and consequently from extension programs. In Sub-Saharan Africa (SSA) agriculture accounts for 20% of the Gross Domestic Product (GDP)⁴⁸ and employs 67% (60-

⁴⁸ Gross Domestic Product (GDP) is the market value of new goods and services produced by the input factors (capital and labor) located within the geographic boundaries of an economy. Gross

70%) of the labor force (Maxwell, 2001 *In:* Devereux & Maxwell, 2001a; Roman, 2003). Alemayehu (2000) estimates the figure to be 30% of the GDP. The Commission for Africa (2005) estimates that agriculture accounts for 30% of Africa's GDP while in developed countries agriculture accounts for a few percent of GDP or less with only around 5% of the population depend on farming. As the African continent urbanizes fewer people are employed in agriculture and agriculture is less important to the continent's economy. Currently, 30% of Sub-Saharan Africa's labor force is in industry and services, which contributes about 90% to the GDP (Roman, 2003). Sub-Saharan Africa is the only region where the annual growth of per capita GDP has been negative, at -1.0%/year between 1975 – 1999, compared with 6.0%/year for East Asia and the Pacific and 2.3%/year for South Asia (Roman, 2003). Africa's per capita GDP fell from US\$ 671 in 1975 to US\$ 245 by 1997, most Africans being worse off than 25 years earlier (Zack-Williams, 2002 *In:* Zack-Williams, *et al.*, 2002). Africa's exports account for only 1.6% of global trade despite Africa having 13% of the world's population. In agriculture, the share of Africa in world exports has dropped steadily, from 8% in 1971-1980 to some 3.4% in 1991-2000 (NEPAD, 2002). Kousari (2004) estimates that "Africa's share in world exports fell from about 6% in 1980 to 2.0% in 2002, and its share of world imports from about 4.6% in 1980 to 2.1% in 2002".

Timmer (1990 *In:* Eicher & Staatz, 1990), depicts the evolution of agriculture through four phases starting with a situation in which the majority of the people

Domestic Product (GDP) allocates product according to the *location* of the owners of the factors. GDP = Output produced within a country's boundaries = GNP - Net Factor Payments (NFP). NFP are payments to domestic factors located abroad minus payments to foreign factors located in the domestic country. Gross National Product (GNP) allocates product according to the *nationality* of the owners of the factors. Gross Domestic Product (GDP) = output produced by domestically owned factors of production anywhere in the world, GNP = GDP + NFP (Mohammadi, 2004) = Gross National Income (GNI) with the following added - also includes a terms of trade adjustment and gross capital formation, which now includes a third category of capital formation: net acquisition of valuables. Included in gross capital formation under the 1993 System of National Accounts (SNA) are capital outlays on defense establishments that may be used by the public, such as schools, airfields, and hospitals (World Bank, 2004).

work in agriculture, while slowly evolving and integrating into a broader economy, to a point where the labor force in farming falls below 20%. Africa appears to be stuck in phase 1 (Eicher, 1990 *In: Eicher & Staatz, 1990*), and the question is how to move beyond this stage, especially as human population pressures combined with traditional farming practices are making it more and more difficult for the rural labor force to maintain a decent quality of life. Eicher (1990 *In: Eicher & Staatz, 1990*) believes that getting agriculture moving will require long-term investments in human capital, rural infrastructure and agricultural research, the “prime movers of agricultural development”.

As early as the 1960s, French agronomist, René Dumont (1966) believed that agricultural revolutions in England and America facilitated the Industrial Revolution. He believed that progress in agriculture should not be considered as preliminary to industrialization, but as an indispensable corollary, in many cases the raw products from agriculture feeding agro-industries. Without industry, without resources of energy except manpower, without modern methods of high yield agriculture and thus without buying power, a vicious cycle is established resulting in resource degradation and increasing poverty. Alemayehu (2000) supports René Dumont’s conclusions adding that in most African countries, the food industry is the lead industry (e.g., in 1985, contributing to 62% of manufacturing in Burkina Faso and 77% in Rwanda).

5.3 FOOD PRODUCTION

5.3.1 Global Food Production

5.3.1.1 Worldwide over-production of food, a big question in the 21st century

Food security implies the ability to acquire enough food to satisfy adequate nutritional requirements at both national and household levels (UNECA, 2003). More than 70 million people died in famines worldwide during the 20th century. However, the link between crop failure and famine was broken in the late 20th century, due to the development of effective humanitarian responses by the global community. Likewise, outside of Africa famine mortality has been virtually eliminated due to effective food aid responses from the global society (Devereux, 2000). Thus, famine is not just about crop failure but represents a complex biological, technical, social and political problem existing since biblical times (Eicher, 1990 *In:* Eicher & Staatz, 1990) (Table 5.1).

Table 5.1: The number of people dieing from famine by region of the world and by decade

Decade	East Asia	Europe	SE Asia	South Asia	Africa	Total
1900s	-	-	-	-	42,500	42,500
1910s	-	-	-	-	155,000	155,000
1920s	7,000,000	9,000,000	-	-	-	16,000,000
1930s	-	7,500,000	-	-	-	7,500,000
1940s	5,000,000	2,010,000	-	2,550,000	300,000	9,860,000
1950s	15,750,000	-	-	-	248,500	15,998,500
1960s	15,750,000	-	-	-	1,052,500	16,802,500
1970s	-	-	1,750,000	1,630,000	471,000	3,851,000
1980s	-	-	-	-	1,425,000	1,425,000
1990s	-	-	3,150,000	-	470,000	2,470,000
Total	43,500,000	18,510,000	4,900,000	4,180,000	4,164,500	75,254,500

Source: Devereux (2000) with permission, ITDG Publishing/University of Natal Press. East Asia = China, Taiwan, Japan, North/South Korea. Southeast Asia = 11 countries south of China. South Asia = Bangladesh, British Indian Ocean Territory, Bhutan, India, Maldives, Nepal, Pakistan & Sri Lanka

Over the last 35 years, global per capita food production outstripped population growth by 16%. The world had more food available per person than ever before in human history. One of the greatest problems faced by the world's farmers was over-production resulting in low farm prices. Food insecurity did not result from an absolute shortage of food, but had economic roots (e.g., poverty). The problem was that food was unevenly distributed (Copeland, 2000).

Globally, even after the doubling of world grain supplies, the share of trade in total grain consumption has remained stable at about 10%. Thus, by and large, most of the world's food consumption takes place in the countries in which it is produced (NEPAD, 2002), which is that much more of a reason for Africa to look towards increasing grain production on the continent.

The 1996 World Food Summit (WFS) set a global target of a reduction in the number of hungry people by at least 20 million/year between 2000 and 2015 (see Chapter 13, Section 13.12.3, Role of Private Sector Versus Foreign Aid in Economic Development). The latest figures demonstrate that the average annual decrease in undernourished people since 1996 is 2.5 million/year, well below the goal of halving undernourishment⁴⁹ by 2015. For this to happen now would mean a decrease in undernourishment by 24 million people/year, almost 10 times the current pace, in order to reach that goal (Roman, 2003).

"It is estimated that if the self-sufficiency ratio in Sub-Saharan Africa is to stay the same in 2015 as in 1995-97 (about 85%), the subcontinent will have to meet 118 million tons of its projected needs of 139 million tons of cereals through increased production

⁴⁹ **Undernourishment** is defined as getting under a certain minimal caloric intake/day, generally 1,720-2,300 calories/day for an adult depending upon the reference (see Section 5.4, HUNGER LINKED TO POVERTY). **Malnourishment** is not getting sufficient dietary nutrients such as amino acids/protein (e.g., kwashiorkor), vitamins (e.g., vitamin A deficiency impairing the immune system) or minerals (e.g., salt/ iodine, iron-deficiency anemia).

in the region itself, requiring a substantial increase of output. These stark realities highlight the huge scale of the problem” (NEPAD, 2002).

If current figures provided by Brown (2003a; 2003b) on global grain deficits are accurate (see below), a significant reduction in Africa’s undernourishment may be an unachievable goal, especially if it relies on foreign food aid. South Africa is the only country in Sub-Saharan Africa that is relatively food self-sufficient.

5.3.1.2 Keeping up with future demand – global deficits of the 21st century

However, can agriculture provide for the food needs of a world population projected to exceed 7.5 billion by the year 2020? Concern is growing that it may not be able to.

According to Lester Brown and analysts at the environmental think-tank, the Earth Policy Institute, the idea of a global grain surplus began changing around the year 2000 when the first global grain deficits were observed. By 2003, this amounted to a global shortfall of rice, wheat and corn of 96 million tons. In 2004, 100 million additional tons of grain were needed just to break even with the 2003 deficit. Henri Josserand, Chief of FAO’s Global Information and Early Warning System, expected cereal production to be close to total levels of utilization in 2004/2005. A cereal output forecast an increase in cereal production, by 29 million tons to 1,985 million tons. If so, the need for another major drawdown in global cereal stocks would be averted. Josserand agreed that in the previous four years, cereal stocks had been declining sharply (FAO, 2004). How long can global cereal production keep up with demand?

There are indications that the highly productive fertilizer and seed technologies introduced over the past three decades may be reaching a point of diminishing

returns (Bouis, 1993; Cassman, DeDatta, Olk, Alcantara, Samson, Descalsota & Dizon, 1995; Flinn & DeDatta, 1984 all *In: Gruhn, Goletti & Yudelman, 2000*) (see Section 5.12.1.2, Green Revolution technologies). Prospects for expanding low-cost irrigation, one of the driving forces behind yield increases, are also becoming more limited (Rosegrant & Svendsen, 1993; Rosegrant, 1997; Carruthers, Rosegrant, & Seckler, 1997 all *In: Gruhn, et al., 2000*) (see Section 5.12.1.3, Irrigation potential), as are the prospects for converting marginal lands into productive arable land (Bockman, Kaarstad, Lie & Richards, 1990; Crosson & Anderson, 1992 both *In: Gruhn, et al., 2000*). Furthermore, new technologies such as genetically engineered, yield-increasing plants are not expected to be major factors in food production increases in developing countries during the next two decades (Hazell, 1995; Peng, Khush, & Cassman, 1994 both *In: Gruhn, et al., 2000*). Genetically modified (GM) high yielding crops and irrigation were the basis of Nobel Prize winning Norman Borlaug's 1960s "Green Revolution". Consequently, keeping pace with population growth and increasing land scarcity will pose major challenges compared to the recent past (Gruhn, *et al.*, 2000). FAO (2002a) identifies the shortcomings of the Green Revolution as:

- "It was heavily geared to the world's three leading cereal crops (wheat, maize/corn and rice), which were suited to its emphasis on maximizing yields. Other crops, including many that are important in Sub-Saharan African, such as cassava, millet, sorghum, banana, groundnut and sweet potato, needed a different approach.
- It was suited only to areas with good soils and water supplies, and largely neglected the more marginal rainfed areas with problem soils and uncertain rainfall.
- It relied on farmers being able to afford inputs, and did little for poor smallholders with insufficient funds or access to credit.
- Finally, it largely ignored the possible environmental consequences of high input use, such as the pollution of water and soils with nitrates and pesticides".

For instance, after the 1973-74 Sahelian famine, of the US\$ 11 billion spent in the Sahel until the next major drought a decade later, only 1.4% was spent on soil and

water conservation and 4% on rainfed crops (Rosenblum & Williamson, 1987) (see Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture).

Brown and his staff have come to similar conclusions, believing that the failure to develop still higher yielding grains, falling water tables (e.g., from irrigation, human and industrial consumption) and increasing temperatures (e.g., global warming) are the main reasons that crop production is not increasing, while human populations continue to climb. Brown is concerned that growing global deficits will result in rising food prices, and that there will not be enough grain to go around for the 100+ countries that import grain. This could result in political destabilization, as has been seen in a number of African countries when the price of flour and thus bread was increased (Brown, 2003a; 2003b). Thus achieving food security through redistribution of grains to the poor across international boundaries (Mellor, 1990b *In:* Eicher & Staatz, 1990) as is being practiced through globally subsidized humanitarian assistance may not be sustainable in the long-term if trends continue.

To counter this, FAO predicts that world agricultural output will pick up and grow 1.6%/year to 2015, outstripping the global population growth of 1.1%/year. Maxwell (2001 *In:* Devereux & Maxwell, 2001a) raises the problem of the global population increasing by 90 million people/year, requiring an extra 30-40 million tons of grain/year to feed them. World grain production peaked at 380 kg/head/year in 1985, dropping to 350 kg/head by 1993. However, it is predicted that developing countries will become increasingly dependent on imported cereals (Madeley, 2002). The question that must ultimately be asked is whether Sub-Saharan Africa can afford to sit back and assume that it will be fed by the rest of the world, given the apparent grain shortages over the last four years and a population that will more than double in 50 years to about 1.8 billion people?

Global warming raises increasing concern over food production in Africa. Madeley (2002) cites an FAO study that climate change could cause severe drought in parts of Africa by 2050, placing an additional 30 million Africans in danger of famine. At the turn of the century, the World Bank (2000) estimates that 60% of Sub-Saharan Africa is vulnerable to drought and 30% extremely vulnerable.

There is also growing concern that with increasing fuel prices, instability in the Middle East and projected 40-70 years of cost-effective fossil supplies, alternative fuel technologies will be increasingly necessary (see Chapter 13, Section 13.7.2, Western Foreign Policy and Multi-Nationals Exploiting Africa). Maize and soy bean production that used to feed people directly and/or indirectly through use as livestock fodder, may be increasingly converted to biofuels, ethanol and bio-diesel respectively. The U.S. Department of Agriculture (USDA) estimates that 11% or 2.54 million tons of America's 2005 maize crop was used to create ethanol. U.S. production of ethanol and bio-diesel is projected at 28.4 billion liters (7.5 billion gallons) by 2012, or 5-7% of total petrol consumption (Stebbins, 2005). The U.S. production goal is 133 billion liters (35 billion gallons) of renewable fuel a year by 2017 (Runge & Senauer, 2007). U.S. ethanol production, primarily from corn, totaled 10.64 billion liters [(2.81 billion gallons) in 2003 (up from 8.10 billion liters (2.14 billion gallons) in 2002] with production projected to increase to 12.11 billion liters (3.2 billion gallons) by 2025 (U.S. Dept. of Energy, 2005). It takes 2.69 kg of corn grain to make a liter of ethanol (Ferguson, 2004). Of a projected global maize production of 666 million tons, 36.5 million tons, or 5.5% of total global production, will be used to produce ethanol in 2005 (IGR, 2005). This is also resulting in increased rice and wheat prices as farmers replace their fields with corn as corn prices increased to over US\$ 4.38/bushel (dry measure equivalent to 35.24 liters) in March 2007 and could climb as high as US\$

5/bushel if oil increases to US\$ 80/barrel. It is projected that given continued high oil prices, the rapid increase in global biofuel production will push global corn prices up by 20 percent by 2010 and 41 percent by 2020 (Runge & Senauer, 2007). This implies that sooner than later, there may be less and more costly grain to feed the people of the Developing World who have grown accustomed to living on food produced from the First World. Regardless of the cost of transportation, or global warming, the food may just not be there, as it will be converted to an alternative energy source.

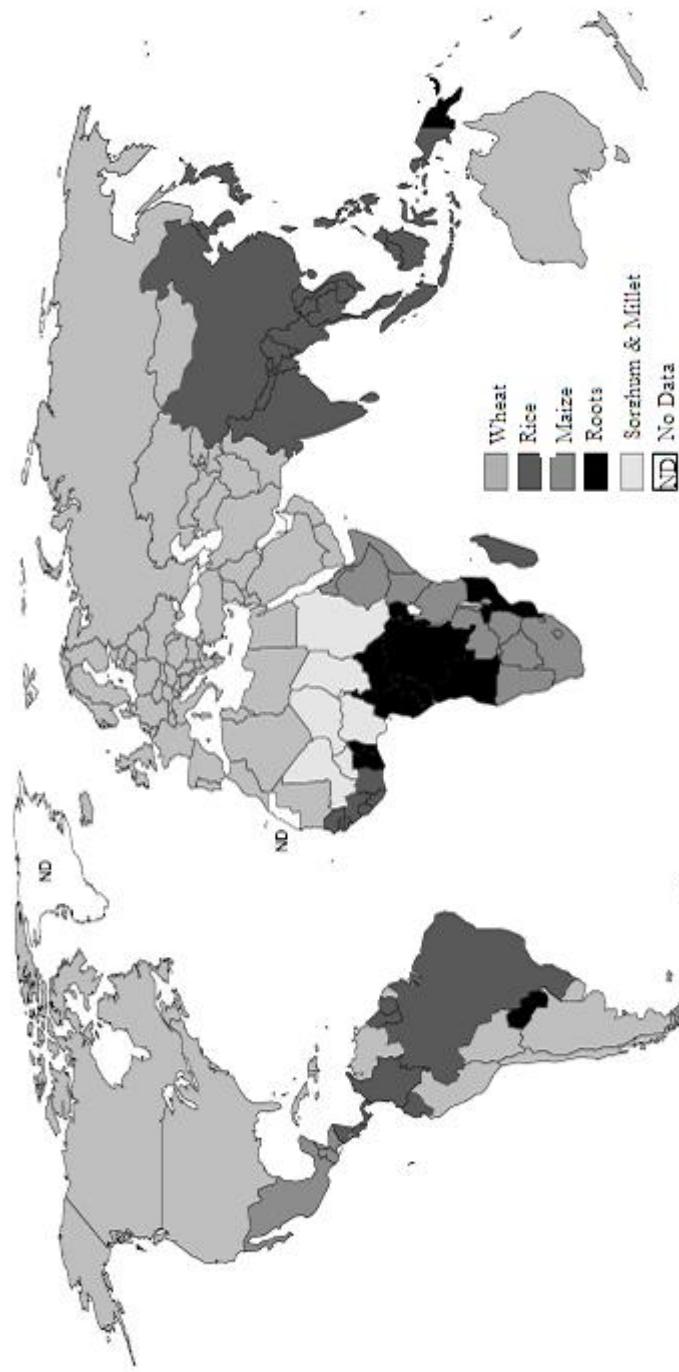
5.3.2 Food Production Zones of Sub-Saharan Africa

Africa can be divided into three food-crop zones linked to agro-ecological, climatic and vegetational zones (Figure 5.2) (FAO, 1997a):

- “The sorghum and millet zone (chickpeas and cowpeas): Sudano-Sahelian region from Mauritania to Somalia;
- The root crop zone (cassava and yams): Guinea-Conakry to the Democratic Republic of Congo (DRC); and
- The maize zone: Kenya, Tanzania, Zambia, Mozambique, Malawi, and Angola to South Africa”.

“Carbohydrates are the single most important source of food energy (calories) in the world” (FAO, 1997a) and in Sub-Saharan Africa they are found in the form of grains and root crops. “Those persons with high carbohydrate diets are often in the lower economic strata as foods high in carbohydrate, such as cereal grains, are most often the least expensive” (FAO, 1997a).

The importance of grain as a source of energy (calories) in Sub-Saharan Africa cannot be underestimated.



Source: FAO (1997a), with permission UN & FAO

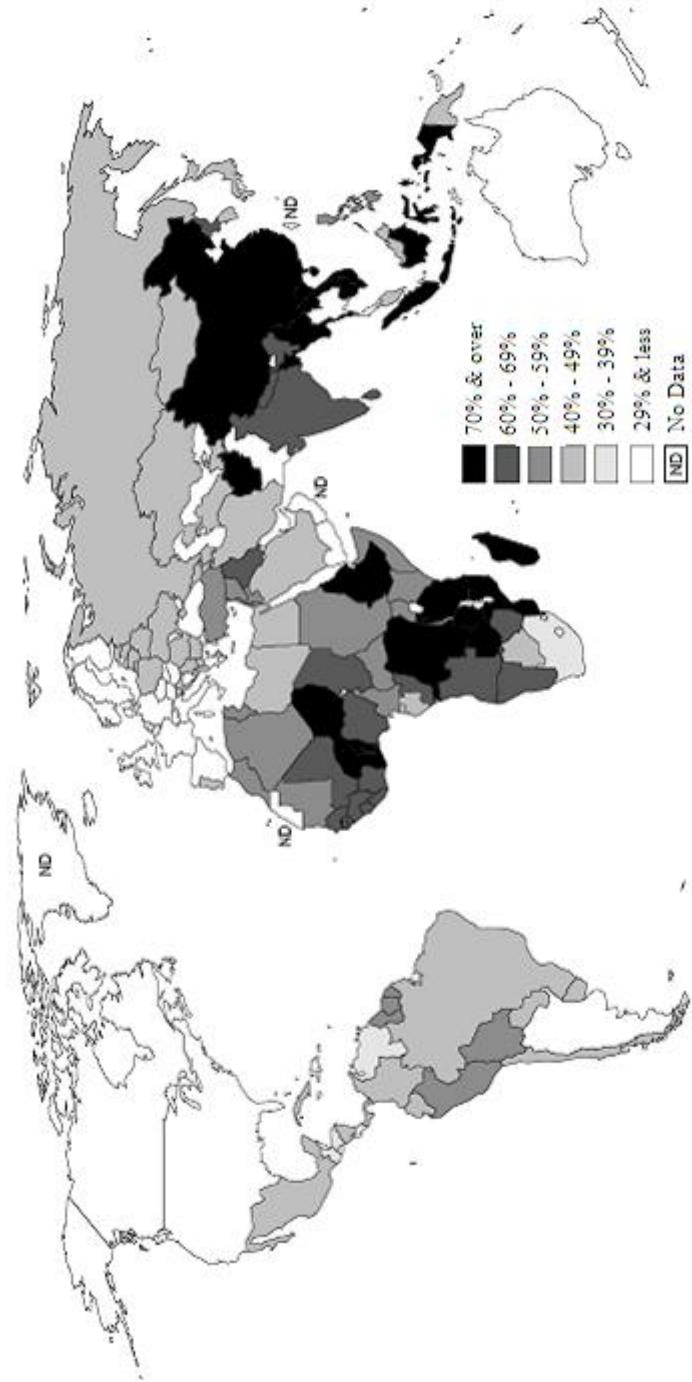
**Figure 5.2: Geography of global grain production,
1990-1992**

“In Africa, people derive 67% (two-thirds) of their calories from less expensive starchy⁵⁰ staples (such as cereals and roots). Only 6% is derived from animal products. In Europe, for example, this percentage is reversed” (Van Wyk, 2000).

FAO (1997a) estimates that Africa and Asia obtain 70% or more of their total calories from grains demonstrating the importance of grains in people’s diets (Figure 5.3). “As a percent of energy (calories), total carbohydrate/starch ranges from about 40% to over 80%, with the developed countries, such as those in North America, Western Europe and Australia at the low end of the range, and developing countries in Asia and Africa at the high end” (FAO, 1997a). Grain deficits in Sub-Saharan Africa are thus a major source of undernourishment. A major problem in Sub-Saharan Africa is that most people’s diets depend upon one major grain, which can also result in malnourishment:

“Carbohydrate foods (in Sub-Saharan Africa – grains and root crops) are an important vehicle for protein, micronutrients and other food components, like phytochemicals, which have important benefits for health. Individual food sources vary, however, in the provision of these components. A single food source of carbohydrate is therefore undesirable and populations whose diets are primarily based on a single food can suffer from micronutrient deficiencies due to lack of variety. It is important, therefore, that a number of different carbohydrate sources be consumed and efforts should be made to encourage a wide variety of carbohydrate foods” (FAO, 1997a).

⁵⁰ Starch is one of three types of carbohydrates called a polysaccharide and is formed of a complex long chain of glucose molecules common in grains and root crops



Source: Griggs (1996, In: FAO (1997a), with permission, Annals of the Association of American Geographers)

Figure 5.3: Percent energy from the dominant starch staples, 1990-1992

In addition, on average only 10 kg of meat/person/year is consumed in Sub-Saharan Africa and by 2030, slow economic growth in Sub-Saharan Africa will limit increases in both meat and dairy consumption (FAO, 2002a). Fish now provide an average of 20% of the protein consumed in Africa; however in Sub-Saharan Africa, fish consumption may stagnate or decline, since wild stocks are almost fully exploited and aquaculture, except in Egypt (not considered as part of Sub-Saharan Africa) is in its infancy (FAO, 2002a).

5.3.3 Food Security in Africa

Food production in Sub-Saharan Africa has in fact increased by over 25% in the last two decades, but not fast enough in terms of per capita production (Roman, 2003). Africa is the only region where average food production per capita has declined over the past 40 years. Since 1970, it has fallen by 15-25%, with imports rising from 8 million tons in 1980 to 12 million tons in 1994. Cereal yields average 1 ton/ha in Africa compared to a global average of 3 tons/ha. (Maxwell, 2001 *In: Devereux & Maxwell, 2001a*). Brown (2003a) estimates in Sub-Saharan Africa that annual grain production per person supplies half the needed calories, the rest coming from meat, milk, eggs and fish. Annual grain intake

“averaged 147 kilograms (per person) between 1961 and 1980, fell to 120 kilograms (per person/per capita) between 2000 and 2002, a drop of 18%. Africa’s ribs are beginning to show. This unfolding food emergency does not exist in a vacuum. Desperate Africans are turning to bushmeat in an effort to survive, threatening various forms of wildlife—from herbivores to gorillas” (see Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade and Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, The Forest People and the *Dobi Dobi*, More Parks And Protected Areas). Efforts to protect wildlife by setting up parks are breaking down as hungry Africans try to survive” (Brown, 2003a).

Average cereal yields in Africa are 50% of those in the other developing regions of Asia, Latin America and the Caribbean. Malnutrition in Africa has remained very high. Food systems have become more vulnerable than before. Food imports and food aid continue to be major issues in terms of food security. Projections are that in Sub-Saharan Africa, annual increases in food production will be lower than increases in food consumption, resulting in a 4-fold (400%) increase in food imports. Sub-Saharan Africa will show little improvement in per capita food production unless population growth can be curbed or the rate of food production significantly increased (Maxwell, 2001 *In: Devereux & Maxwell, 2001a*). Jeffrey Sachs (2005) found the key determinant in whether a country grows economically or not is food productivity, with Sub-Saharan Africa's declining per capita food production being indicative of all its other problems including low soil fertility, low use of fertilizers, limited irrigation, poor road networks, low literacy and high fertility. There will be many hurdles in overcoming the stigma and politics of using genetically modified seeds (e.g., Zimbabwe and Zambia) as a means of increasing food production.

“Africa, which reversed from being a key exporter of agricultural commodities into being a net importer, has the highest percentage of undernourished and has shown the least progress in reducing the prevalence of undernourishment in the last 30 years. Chronic food insecurity now affects some 28% of the population – that is nearly 200 million people who are suffering from malnutrition” (Roman, 2003), implying this refers to Sub-Saharan Africa.

Devereux & Maxwell (2001b *In: Devereux & Maxwell, 2001a*) estimate that there were 840 million undernourished people world-wide in 1992 of which 26% were from Africa. This is up 11% from 1971. FAO (2005) places the percentage of undernourished people in Sub-Saharan Africa as:

<u>Date</u>	1969-71	1979-81	1990-1992	1996-1998	2000-02
<u>%</u>	34	37	35	34	33
<u>Undernourished</u>					

NEPAD (2002) and FAO (2002a) estimate that the number of chronically undernourished people in Sub-Saharan Africa increased from 168 to 194 million between 1990 and 1999 (Table 5.2). Populations in a dry belt extending from the Sahel to the Horn of Africa, and south into East Africa are chronically food insecure (Winterbottom & Neme, 1997). By 2010, the World Bank expects the average per capita caloric intake to be 2,170 calories in Sub-Saharan Africa, compared to 3,470 calories in developed countries (Alemayehu, 2000).

Table 5.2: Population, per capita dietary energy supply and prevalence of undernourishment

Regional Groupings	Total population	Per capita dietary energy supply	Number of people undernourished	Proportion of undernourished in total population			
	1990-92 (millions)	1997-99 (millions)	1990-92 (Calories)	1997-99 (Calories)	1990-92 (millions)	1997-99 (%)	1990-92 (%)
Africa	595.1	710.3	2 322	2 382	173.1	200.1	29
Sub-Saharan Africa	474.5	572.4	2 120	2 190	167.7	194.0	35

Source: NEPAD (2002) with permission, New Partnership for Africa's Development (NEPAD).

It is estimated that by 2009 that 60% of the Sub-Saharan Africa population will consume less than minimum nutritional requirements. It appears that the targets of halving poverty and under-nutrition by 2015 will not be met in Sub-Saharan Africa (Devereux & Maxwell, 2001b *In:* Devereux & Maxwell, 2001a) (see Chapter 13, Section 13.12.3, Role of private sector versus foreign aid in economic development). Maxwell (2001 *In:* Devereux & Maxwell, 2001a) provides the following scenarios for per capita caloric intake in Sub-Saharan Africa (Table 5.3).

Table 5.3: Daily per capita caloric availability from various scenarios for Sub-Saharan Africa, 1990 and 2020

Region	1990		2020 (Calories/person/day)			
	Baseline	Low ^a Population Growth	Low/Investment/ Slow Growth ^b	High Investment/ Rapid Growth ^c	Trade Liberalization ^d	
Sub-Saharan Africa	2,053	2,135	2,219	2,021	2,227	2,093

- a. Low pop growth as determined by United Nations
- b. Simulates combined effect of 25% reduction in non-agricultural income growth rates and reduced investment in agricultural public research and social services
- c. Simulates 25% increase in agricultural income growth and higher investment in agricultural research and social services
- d. Full removal of tariffs and subsidies

Source: Maxwell (2001 *In:* Devereux & Maxwell, 2001a) with permission, ITDG Publishing/University of Natal Press.

Young (2001 *In:* Devereux & Maxwell 2001a) estimates that for a healthy population with a demographic composition typical of Africa, under normal nutritional conditions and environmental temperatures of 20°C, the average caloric requirement is 1,950-2,210 calories⁵¹/person/day for light activity. Women need 1,782 calories/person/day, while older children and adult males might require 2,234 calories/person/day.

Similarly, FAO (2003a) estimates that between 1720-1960 calories/person/day are consumed by adults in developing countries undertaking light activities, anything below this being an indication of undernourishment. FAO (2000b) estimates that depending upon the country undernourishment in Sub-Saharan Africa is indicated by consumption equal to or less than 1,730-1,900 calories/person/day. Baylor College Of Medicine (2004) indicates that the Recommended Daily Allowance (RDA) for sub-adults as 1,300 calories/day for children 1-3 years of age, 1,800-2000 calories/day for children 4-8 years old, 2,000-2,500 calories/day for 6-13 year olds, 2,200 calories/day for girls 14-18 years old and 3,000 calories/day for

⁵¹ Same as kcalories or kilocalories

boys 14-18 years old, though depending on the activity level of the child the RDA could increase or decrease. Smith (1992) suggests that an average minimum daily requirement of 2,200 calories/person/day and 40 gm. protein/person/day would be acceptable for a sample in which 50% of the population is children (e.g., husband, wife, three children and one surviving grandparent).

FAO (2002a) estimates that in Sub-Saharan Africa there is likely to be little or no decline in the numbers of undernourished people, although the proportion will approximately halve. In Sub-Saharan Africa, 15% of the population or 183 million people will still be undernourished by 2030, by far the highest total for any region of the world and only 11 million less than in 1997-99 figure in Table 5.2. This is cause for serious concern.

“Acute food insecurity in 2003 is affecting 38 million people in Africa who are facing the outright risk of famine, with 24,000 dying from hunger daily. Famines are the most visible and extreme manifestation of acute food insecurity. Of the 39 countries worldwide that faced food emergencies at the beginning of 2003, 25 are found in Africa...60% of the World Food Program (WFP)’s work now takes place in Africa” (Roman, 2003).

Madeley (2002) estimates that 18 of the 23 countries in the world facing severe problems feeding their people are African.

In 1995, Sub-Saharan Africa imported 12 million tons of grain, while producing 80 million tons (Maxwell, 2001 *In: Devereux & Maxwell, 2001a*). Imports of cereals by Sub-Saharan countries are estimated at some 17 million tons in 2000, including 2.8 million tons of food aid (NEPAD, 2002). The Commission for Africa estimates that 2002 food imports included US\$ 22 billion worth of food with a food aid complement worth US\$ 1.7 billion in 2002. According to the World Bank projections, Africa will have a food shortage of 250 million tons/year

by 2020 (Mule, 2003). Rosegrant, Paisner, Meijer and Witcover (2001) project a total food deficit of 32 million metric tons/year in Sub-Saharan Africa by 2020 (Table 5.4). The importance of cereals/grains in the diet of Sub-Saharan Africa cannot be over-emphasized. While about 60% of world consumption of coarse grains is used for animal feed, in Sub-Saharan Africa, where food insecurity is very high, 80% of the grain harvest is consumed by humans (FAO, 2002a). Alemayehu (2000) raises the issue that as wheat consumption in Africa grows, displacing more traditional grains/food such as sorghum, millet, maize and cassava, it will be harder to attain food self-sufficiency, as few areas have the climate to grow this crop in substantial quantities.

Table 5.4: Estimated food production, demand and imports, Sub-Saharan Africa, 1997 and 2020

Commodity	1997			2020		
	Production (1000 Metric Tons)	Demand (1000 Metric Tons)	Net Trade (1000 Metric Tons)	Production (1000 Metric Tons)	Demand (1000 Metric Tons)	Net Trade (1000 Metric Tons)
Milk	15,826	18,135	-2,279	33,519	38,115	4,596
Eggs	901	905	-9	1,727	1,723	+4
Roots and Tubers	139,946	139,995	-14	251,959 (307-201)	251,824	+135
Cereals	69,303	82,505	-12,374	128,528 (187-96)	155,872	27,346
Meat	5,407	5,505	-153	10,958	11,252	293
Total Food Imports	-	-	-14,829			32,235

Note: 1) Some differences between production and demand seem to be in error – data left as found in original tables. 2) Numbers in parentheses are highs and lows from optimistic and pessimistic scenarios in million metric tons.

Source: Extracted from Rosegrant, Paisner, Meijer and Witcover (2001) with permission, International Food Policy Research Institute (IFPRI).

It should be noted that while world consumption of roots, tubers and plantain as human food has been on the decline, in 19 countries, all in Sub-Saharan Africa, they provide more than 20-50% of all food energy (FAO, 2002a).

As is discussed later, a major factor in food production in Africa can be related to declining soil fertility. Soil fertility is impacted by a wide range of biological, physical and socio-economic constraints, including nutrient deficiency, inappropriate germ plasm and cropping system design, pests and diseases, poverty, institutional failures, perverse national and global policies with respect to incentives (CIAT, 2002), and over-population.

Norman Borlaug, “father of the Green Revolution”, believes the lack of food production increases in Africa are a major worry and blames: 1) neglect by political leaders, even though agriculture provides the livelihood to a claimed 70-85% of the people in most countries, 2) lowland tropical environments especially the forest and transition areas, which are fragile ecological systems, where deeply weathered, acidic soils lose fertility, 3) shortened or eliminated bush-fallow from expanding populations resulting in nutrient and organic depletion and 4) lack of infrastructure and supply systems (Borlaug, 2000). Mellor (1990a *In: Eicher & Staatz, 1990*) believes that Africa’s agricultural problems can be traced back to the unusually inappropriate national and foreign assistance strategies of the 1970s, resulting in a lack of trained personnel in both agriculture and employment-oriented development strategies, along with horrendous infrastructure and instability in export pricing.

5.4 HUNGER LINKED TO POVERTY

“On September 11, 2001 two planes hijacked by terrorists were deliberately flown into the World Trade Center in New York killing around 3,000 people. The world came to a virtual halt....On September 11, 2001, if that day was an average kind of day, around 16,500 children (world-wide) under the age of 5 died because they were undernourished; their bodies were too weak to survive. That is over 5 times as many as died in New York, and that is just people under the age of 5. The world did not come to a halt, newspapers were not dominated by the tragedy and there was no wave of compassion for the bereaved. And there was no talk of a war on the cause of their deaths, of routing out those responsible. But on the following day, on the 12 September 2001, another 16,500 children under 5 died in similar circumstances. Once again, silence. And the following day, and the day after that...poverty and hunger are fertile breeding grounds for unrest and need to be tackled as part of the battle against terrorism” (Madeley, 2002).

“Weather is partly to blame. But African famine is no accident of the rains; it is mostly man-made, and it is getting worse. The underlying causes are politics, greed, and ignorance – in Africa and elsewhere. Even in the worst affected places, few people go hungry if they are not so poor” (Rosenblum & Williamson, 1987).

In the late 1980s, it became reasonable to focus on food insecurity as the inability of poor countries, poor families and poor individuals to purchase sufficient quantities of food from existing supplies (Mellor, 1990b *In:* Eicher & Staatz, 1990). In the same period, it was also estimated that 100 million people or 20% of Africa’s population did not get enough to eat and 20-30% of Africa’s children were malnourished (Eicher, 1990 *In:* Eicher & Staatz, 1990). UN data show that the proportion of under weight children in Sub-Saharan Africa increased from 26% in 1980 to 28.5% in 2000, which accounting for population increases, in absolute numbers means a rise from 22 million to 38 million children (Devereux & Maxwell, 2001b *In:* Devereux & Maxwell, 2001a). By 2020, this could

amount to between 25.7-32.4% or 43.3 to 54.6 million underweight children under the age of 5 years, respectively in Sub-Saharan Africa (Smith & Haddad, 2000). The 4 million African children that die each year (Rosenblum & Williamson, 1987) can be closely related to mal-/under-nutrition, which makes them more susceptible to disease from immuno-suppression (Sachs, 2005). This problem is not unique to Africa. Poverty, a central cause of malnutrition is deeply entrenched in Africa (Eicher, 1990 *In:* Eicher & Staatz, 1990) (see Chapter 11, Section 11.13.2.1, Child mortality as a health indicator and Chapter 12, Section 12.6.1.1, Increase in poverty and decline in health from structural adjustment).

Hunger and poverty in Africa must be seen as the most urgent and intractable problem facing those concerned with development in the 21st century (Devereux & Maxwell, 2001b *In:* Devereux & Maxwell, 2001a). In addition to food availability and distribution, the single most important cause of hunger is poverty. Thus, access to food is not entirely a matter of availability or need, but rather of wealth. Put another way, hunger is caused not by scarcity but by poverty, a problem that is by no means restricted to Least Developed Countries (LDCs). Questions of hunger and food security are, therefore, questions of poverty (Copeland, 2000; Patel & Delwiche, 2002; Sen, 2002; DFID, 2002; Roman, 2003). Poverty can be defined as spending most of one's income on food or expending most of ones' time producing food for subsistence (Devereux & Maxwell, 2001b *In:* Devereux & Maxwell, 2001a). USAID (2002) estimates that more than 45% of Sub-Saharan Africa's population is now estimated to be in a state of poverty. Palmer and Kline (2003) estimate that:

- More than half of Sub-Saharan Africa's 600 million people still live on less than US\$ 1 a day⁵² [IFAD (2002) and FAO (2002a) define

⁵² Based on "Purchasing Power Parity" where income in local currency is converted to U.S. dollars, and official exchange rate adjusted for cost-of-living differences between the U.S. and country in question, allowing comparison of incomes across countries

“absolute/extreme poverty” or the Poverty Datum Line (PDL) as living on less than US\$ 1/day] (see Chapter 13, Section 13.1 CURRENT STATE OF AFRICAN ECONOMIES and Section 13.12, CAPITALISM WITH A CONSCIENCE).

- More than 28 million Africans are living with HIV/AIDS (Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome), creating 12 million AIDS Orphans to date (see Section 5.8, HIV/AIDS DECLINING AGRICULTURAL PRODUCTION AND FOOD SECURITY IN SUB-SAHARAN AFRICA and Chapter 11, Section 11.13.2.2 HIV/AIDS)
- Forty per cent (40%) of children never go to school in Africa – the only region in the world where the numbers of children out of school are rising (see Chapter 11, Section 11.13.1.1, Educational situation in Sub-Saharan Africa at the beginning of the new millennium

Globally, while there will be a slight reduction in the proportion of people living in absolute/extreme poverty

“only in Sub-Saharan Africa, where incomes are expected to grow very slowly, are the numbers living in poverty expected to rise, from 240 million in 1990 to 345 million in 2015. By then, two out of five (40%) people in the region will be living in poverty” (FAO, 2002a).

It should be noted that since 60-70% of Sub-Saharan Africans are subsistence farmers and pastoralists, growing, and capturing their own food, they are not really as bad off as one might think, but by any analysis, they are poor and their purchasing power in monetary terms is quite limited, though barter and payment in kind helps overcome the lack of hard currency to a very small degree. Additionally, as will be seen over much of rural Sub-Saharan Africa food self-sufficiency is rapidly disappearing resulting in mass migrations from the interior

towards the coastal areas and major urban centers. These countries, however, are ill equipped to deal with this problem, both economically and infrastructurally. As this change in demographics occurs, the next major question is “Who will produce food to feed these urban masses, increasingly living in what some project will become mega-cities”?

“Hunger is particularly damaging to health. It is estimated that nearly half (50%) of all childhood deaths are related to poor nutrition (protein-energy and vitamin A deficiency). And iron-deficiency anemia dramatically increases pregnancy-related mortality” (World Economic Forum, 2004).

According to UN statistics, 529,000 women died of birth related causes in the year 2000, mostly in developing countries of which more than half, namely 270,000, died in Sub-Saharan Africa. In contrast, fewer than 2,500 died in developed countries. In Europe there were 24 maternal deaths per 100,000 live births in the year 2000, while in Africa the average was 920/100,000 live births. The top 12 countries with 1,300 maternal deaths or more/100,000 live births are all in Sub-Saharan Africa and are in, descending order: Rwanda, Sierra Leone, Burundi, Ethiopia, Somalia, Chad, Sudan, the Ivory Coast, Equatorial Guinea, Burkina Faso, Angola and Kenya. Twenty-one Sub-Saharan African countries exceed 1,000 maternal deaths or more per 100,000 live births. Outside Sub-Saharan Africa, only Haiti has more than 1,000 maternal deaths/100,000 live births (*Agence France-Presse*, 2004).

“Poverty is not just a statistic. It is about misery, undernourishment, ill health, lack of education and other basic needs for decent living, shortened life expectancy, and lack of hope. It is about people’s inability to achieve their full potential. It is about missed opportunities. It is a negation of humanity” (Mule, 2003).

Poverty and hunger deprive the world of the creative potential and economic contribution of billions of human beings (Messer & Cohen, 2001). About 90 % of the human brain growth and much of the body's growth takes place in the first five years of life, making nutrition not only a humanitarian imperative but also a basic requirement for sustained economic growth (Rosenblum & Williamson, 1987).

The FAO (2002a) states, “undernourishment can affect brain development in the womb and attentiveness in class, and so is associated with poor educational performance”. “Children that are malnourished experience stunting in their mental and physical development, the effects of which last throughout their lives”,

hunger placing families in an endless cycle, a poverty trap passed on to the next generation, the children of the poor (Short, 2001). Levinson and Bassett (2007) place the critical period of malnutrition as

“especially high during fetal development and during a child's first two years. With children's growth rates, nutritional requirements, and susceptibility to infection at their highest during this time, adverse conditions are more likely to slow growth and cognitive development, and the resulting damage is largely irreversible”.

Alemayehu (2000) raises similar concern over child malnutrition including vulnerability to disease, inadequate physical and intellectual capacities (mental retardation) and low productivity. As things currently stand, Sub-Saharan Africa has lost the race before it gets to the starting blocks in terms of being able to compete in a global market place, as a majority of its population is adversely impacted by poor nutrition. The principal author's mother was a primary school teacher in America during the Great Depression of the 1930s. Skinny little children from poor families could not compete intellectually with better fed youths from middleclass families. These were skinny white children!

There is indisputable evidence that both rich and poor nations are unable to end hunger by simply producing more food and achieving national food self-sufficiency. For example, according to the World Food Program (WFP), there are no shortages of food products in the markets in Lesotho. However, 67% of the population lives below the poverty line and half are classified as destitute. Purchased cereals comprise 75% of annual food needs for Lesotho's poor, and over 70% of the households classified "very poor" in Lesotho have no cereal in reserve. Rapidly escalating prices and vanishing incomes are a lethal combination. The people of Lesotho cannot afford to buy the food that is available (Patel & Delwiche, 2002).

5.5 LAND USE POTENTIAL AND CONSTRAINTS IN SUB-SAHARAN AFRICA

5.5.1 Land Use Potential for Rainfed Agriculture in Africa

Sub-Saharan Africa stands out as the region of the world that is most disadvantaged in terms of unfavorable agro-ecological conditions as well as inadequate transport and communications infrastructure (FAO, 2002a). Estimates of soils in Africa suitable for low-input agriculture (Figure 5.4), implying that large-scale irrigation is absent, use of fertilizers, and pest and weed control is minimal, and soil management does not require high energy mechanized equipment (Eswaran, Almaraz, van den Berg & Reich., 1996) are:

<u>Land Classification for Low-Input Agriculture</u>	<u>% of Land in Africa</u>
Prime	9.6
High Potential	6.7
Medium/Low Potential (Major constraints)	28.3
Desert/Other Unsuitable (Steep land)	55

If one carries the Eswaran, *et al.* (1996) analysis to Sub-Saharan Africa, the following becomes evident:

- Prime/High Potential and Medium/Low Potential lands are just about all in Sub-Saharan Africa (Figure 5.4);
- One can therefore assume that 40% is the Sahara Desert or other deserts north of Sub-Saharan Africa;
- One can assume the 12% Steep Land is in Sub-Saharan Africa (e.g. Mounts Kilimanjaro and Kenya, Rwenzori, Drakensberg, etc.);
- The Namib Desert is the main desert south of the Sahara at 111,147 km² or 0.4 % of the African continent (Jurgens, Burke, Seely & Jacobson, 1997 *In: Cowling, et al., 1997*) – which is insignificant), along with parts of Ethiopia and Somalia;
- One can assume Desert In Sub-Saharan Africa is 55-40-12 = 3%; and
- Just about all the other land is in Sub-Saharan Africa

One can therefore suppose that the following percentages represent Sub-Saharan Africa (Table 5.5):

Table 5.5: An estimate of agricultural land use potential in Sub-Saharan Africa

Land Classification For Low-Input Agriculture	For Entire Continent	% Of Land in Sub-Saharan Africa	Adjusted % For Sub-Saharan Africa Only
Prime	9.6		16.1
High Potential	6.7		11.2
Medium/Low Potential	28.3		47.5
Desert	3.0		5.0
Steep Slope	<u>12.0</u>		<u>20</u>
			99.8 = 100.0

This is a crude estimate, leading one to the conclusion that prime/high potential land for well-managed fallow agriculture makes up about 27% of Sub-Saharan Africa. This compares to 27% of land (596,491,000 ha out of a total of

2,195,958,000 ha or 22 million km²)⁵³ in Sub-Saharan Africa that has “no” or “moderate constraints” for crop production based upon climate, soil and terrain (FAO, 2003b) (Table 5.6), or from 874 million ha (NEPAD, 2002) to 663 million ha (FAO, 2003b)⁵⁴ for all of Africa. Alemayehu (2000) uses an FAO figure indicating 27% of Sub-Saharan Africa is suitable for rain-fed crops. Climate, soil and terrain used by FAO as criteria for determining land suitability for rainfed agriculture are basically the same parameters as used in the above analysis by Eswaran, *et al.* (1996) and Reich, Numbem, Almaraz and Eswaran (2001). Using the above data, it can be estimated that 73% of Sub-Saharan Africa is very poor and/or unsuitable for agriculture as compared to 73% of the land suffering “severe” constraints under the FAO (2003b) classification (Table 5.6).

However, not all of the 27% of the prime/high potential land may be available for agriculture, being in other critical land uses such as parks and protected areas, critical wetlands, forests, or already degraded in over-populated areas such as Rwanda, Burundi, the Highlands of Kenya and Tanzania, southwestern Uganda, Ethiopia and much of Nigeria. As human populations in Africa increase, this is where the battle lines are drawn; what land will remain natural versus be converted to farm land? FAO (2002a) estimates 1,031,000,000 ha in Sub-Saharan Africa as suitable for agriculture. Even if the estimated 31 million ha suitable for irrigation in SUB-SAHARAN AFRICA with environmental constraints (Section 5.12.1.3, Irrigation potential) is added to the FAO estimate in Table 5.6, this would total about 628 million ha implying 39% of this 1.031 million ha of “*arable land*” in SUB-SAHARAN AFRICA would have severe constraints for rainfed agriculture.

⁵³ NEPAD (2002) estimates Sub-Saharan Africa as being 23,621,000 km²

⁵⁴ Global Agro-Ecological Zones (GAEZ). “While representing the most recent global data compilations, the quality and reliability of these data sets is known to be uneven across regions. Especially the quality of the world soil map is reason for concern. It is based on a 1:5,000,000 scale map and it is generally accepted that its reliability may vary considerably between different areas” (FAO, 2003a)

Table 5.6: Climate, soil and terrain constraints to rainfed crop production south of the Sahara

Constraints		Totals	
		(1000 ha)	(%)
WEST AFRICA			
Total without constraints		7976	1.3
Total with moderate constraints	C	155867	24.6
Total with severe constraints	CC	469151	74.1
Total	(1000 ha)	632995	100
	(%)	100	
CENTRAL AFRICA			
Total without constraints		8465	1.3
Total with moderate constraints	C	133594	20.3
Total with severe constraints	CC	515003	78.4
Total	(1000 ha)	657062	100
	(%)	100	
	(%)	100	
EAST AFRICA			
Total without constraints		32625	5.1
Total with moderate constraints	C	202138	31.6
Total with severe constraints	CC	404711	63.3
Total	(1000 ha)	639474	100
	(%)	100	
SOUTHERN AFRICA			
Total without constraints		6090	2.3
Total with moderate constraints	C	49736	18.7
Total with severe constraints	CC	210602	79
Total	(1000 ha)	266428	100
	(%)	100	
SUB-TOTAL			
– No To Moderate Constraints		596,491	27
– Severe Constraints		1,599,467	73
– Total		2,195,958	100

C: Moderate constraint, CC: Severe Constraint

Extracted From: FAO (2003b) with permission, UN & FAO.

Based upon Figure 5.4, it would appear that much of the “prime land” for low input agriculture is also prime commercial land that can be potentially used to feed Africa’s populations using modern technology such as fertilizers, pesticides, drip irrigation, genetically modified organisms (GMOs), etc. This point becomes

critical in planning for Africa to feed itself. This land must be identified and maintained in commercial food production, where possible, to help feed the continent (see Section 5.9.2, Over-Population of Prime Agricultural Land for Low Input Agriculture is also Commercially Viable Land). René Dumont (1966) considers fallow agriculture as a vicious cycle of low-yield agriculture on unfertilized land cultivated by underfed workers, especially in over-populated areas. Low input agriculture, as currently practiced, is a major reason for encroachment on key natural areas and friction between resource users, and can no longer be counted on to feed rural Africa let alone urban centers.

5.5.2 Physical and Environmental Constraints to Overcoming Food Production in Sub-Saharan Africa

A study by Eswaran, Reich and Beinroth, 1997a and Eswaran, Ofori, Mokwunye, Idi-Issa, Ouattara, Sant'Anna and Hoogmoed, 1997b (both *In: Reich, et al., 2001*) showed that 55% of the land area in Africa is unsuitable for agriculture, and that only 11% has high quality soils that can effectively be managed to sustain more than double the continent's current population. According to the World Bank, 80% of Sub-Saharan Africa's soils are fragile and 47% are too dry to support rainfed agriculture (Alemayehu, 2000). Key factors limiting agricultural production in Africa include:

1. **Soil Moisture Stress.** Only about 14% of Africa is relatively free of moisture stress (i.e., 86% of soils suffer from soil moisture stress) (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001); according to another source 67% of soils in Sub-Saharan Africa suffering soil moisture stress (CIAT, 2002). According to the World Bank, 47% of Sub-Saharan Africa's soils are too dry to support rainfed agriculture (Alemayehu, 2000). Moisture stress is not only a function of the low and erratic precipitation but also of

the ability of the soil to hold and release moisture. About 10% of Africa's soils have high to very high Available Water Holding Capacities (AWHC) (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001).

2. **Limited Rainfall.** René Dumont (1966) estimates that between 30° North and South (a line across Africa from about Durban to Cairo), less than 50% of Africa has the adequate rainfall, 800 mm or more, necessary for intensive agriculture. Bond, Child, de la Harpe, Jones, Barnes and Anderson (2004 *In:* Child, 2004) put the crossover point at 700 mm of rainfall between conditions adequate for agriculture versus rangeland.
3. **Hydromorphy** or excess moisture that suppresses aerobic factors in soil building constitutes 8% or 1,904,000 km² of Sub-Saharan Africa (23,621,000 km² total land mass) (NEPAD, 2002).
4. **Phosphorus Fixation.** High free iron content, which is reflected in the red colors of the soil, due to the nature of the parent material or the weathering stage, is employed as an indicator. Phosphorus (P) is immobilized as iron (Fe-) and aluminum (Al-) phosphates in these soils and is thus not readily available for uptake by crops (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001). It is estimated that 4% or 982,000 km² of Sub-Saharan Africa (23,621,000 km² total land mass) suffers from this constraint (NEPAD, 2002).
5. **Nutrient Loss.** It is estimated that 16% or 3,714,000 km² of Sub-Saharan Africa (23,621,000 km² total land mass) is constrained by low nutrient reserves (NEPAD, 2002).
6. **Salinity/Alkalinity.** Soil salinization is the concentration of salts in the surface or near surface of soils. Human induced salinization is a major problem in dry lands and is often associated with large-scale irrigation (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001). This is a major constraint to expanding irrigation over much of the continent (see Section 5.12.1.3, Irrigation potential).

7. **Aluminum Toxicity/Soil Acidification.** Soil acidity and the resultant toxicity of high concentrations of aluminum and manganese in the root zone is a serious problem in sub-humid and humid regions. It is estimated that 4,366,000 km² or 19% of Sub-Saharan Africa's land mass (23,621,000 km²) is confronted with this constraint (NEPAD, 2002).
8. **Soil Depth.** Effective soil depth is a problem in more than 50% of the soils on the Continent and this reduces the potential of the soil for crop production (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001).
9. **Water and Wind Erosion.** Wind and water erosion is extensive in many parts of Africa. Excluding the current deserts, which occupy about 46% of the land mass, about 25 % of Africa's land is prone to water erosion and about 22% to wind erosion – most of this being in Sub-Saharan Africa (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001).
10. **Soil Compaction.** Soil compaction is a worldwide problem, especially with the adoption of mechanized agriculture. It has caused yield reductions of between 40 and 90% in West African countries (Eswaran, *et al.*, 1996; Reich, *et al.*, 2001). This is especially a problem in sandy soils found across much of Africa (Hagedorn, 2003; Hagedorn, *pers. comm.*).

5.5.2.1 Soil moisture stress may be the major constraint to increased agricultural production

“Africa has not had a Green Revolution for the same reason that Australia has not had one: it does not have enough water to use much fertilizer” (Brown, 2003a).

CIAT (2002) estimates 67% of all soils in SUB-SAHARAN AFRICA suffer from soil moisture stress.

Given the marginal soil and rainfall conditions in much of the savanna areas, it was found that in many cases Africans were already optimizing agricultural yields, which could not be substantially increased without costly inputs. The marginal costs of increasing yields are higher than the marginal benefit for the farmer. The foremost factor is the lack of a reliable supply of moisture. Yield increases sufficient to cover the cost of improved seed varieties, fertilizers, and pesticides require a dependable and adequate supply of water. Without water, such investments are more likely to be unprofitable and to result in lower returns than planting the traditional drought-tolerant seed varieties with no purchased inputs (FEWS, 1997). As a result, over much of Sub-Saharan Africa, F₂ generation seeds are planted instead of expensive higher yielding F₁ hybrids produced by seed companies (see Section 5.12.1.2, Green Revolution technologies).

5.5.2.2 Nutrient depletion as a constraint to agricultural production

Africa suffers from geologically induced and inherently low soil fertility as the bedrock consists of mostly granites and gneiss (Nana-Sinkam, 1995). Nutrient loss is an important problem in regions of low-input agriculture, such as in Sub-Saharan Africa. In such regions, when crops are harvested, essential nutrients are taken away in the crop and not replaced (University of Michigan, 2002). Nutrient depletion as a form of land degradation has a severe economic impact at the global scale, especially in Sub-Saharan Africa.

Soil fertility depletion is now known as the fundamental biophysical root cause for declining food security on smallholder farms in Sub-Saharan Africa (Gruhn, *et al.*, 2000).

“Soil degradation indicated by nutrient depletion and loss of organic matter, resulting from erosion and extraction and loss in excess of return, has direct negative influence on agricultural productivity. This may be the single most important constraint to food security in Africa” (NEPAD, 2002).

About 86% of the countries in Africa lose more than 30 kilograms of NPK (Nitrogen, Phosphorous and Potassium)/ha/year (Henao & Baanante, 1999 *In: Gruhn, et al.*, 2000). Estimates in Sub-Saharan Africa indicate a net loss of about 700 kilograms/ha of nitrogen, 100 kilograms/ha of phosphorus, and 450 kilograms of potassium/ha in about 100 million ha of cultivated land over the last 30 years (World Bank, 1996 *In: Gruhn, et al.*, 2000). Henao and Baanante (1999 *In: Gruhn, et al.*, 2000) suggest that nutrient mining may be accelerating. In the more densely populated, semiarid, and Sudano-Sahelian area of Sub-Saharan Africa, net NPK losses have been estimated at between 60 and 100 kg/ha/year. FAO (2002a) cites the loss of NPK as 49 kg/ha/year. Annual depletion rates of soil fertility for Africa were estimated at 22 kg nitrogen (N)/ha/year, 3 kg phosphorus (P)/ha/year, and 15 kg potassium (K)/ha/year (Stoorvogel, Smaling, & Jansen, 1993 *In: Eswaran, Lal & Reich*, 2001).

Stoorvogel, and Smaling (1990 *In: Eswaran, Reich, Almaraz & Zdruli*, 1995) found a progressive depletion of plant nutrients in the cropland soils over a large part of Sub-Saharan Africa where low-input agriculture is practiced. Sanchez and Jama (2002 *In: Vanlauwe, Diels, Singinga & Merckx*, 2002) believe that until soil fertility is addressed, per capita food production in Africa will continue to decrease, this need being analogous to the need for “*Green Revolution*”-type germ plasma in Asia four decades ago. This analogy is supported by the two fathers of the Green Revolution, Norman Borlaug and M.S. Swaminathan (Sanchez & Jama, 2002 *In: Vanlauwe, et al.*, 2002).

Of this soil degradation, Oldeman, 1992 and Oldeman, Hakkeling and Sombrek, 1991 (both *In: Gruhn, et al., 2000*) estimate the following degree of nutrient-related soil degradation and the main causes, all of which can be linked to over-population of people and their livestock (Table 5.7). Insecure land tenure is believed to be another reason for minimal investment in long-term soil productivity (Gruhn, *et al.*, 2000) (see Section 5.7.1, Property Rights and Land Tenure, Constraints to Soil Fertility and Agricultural Production). Based upon Oldeman, van Engelen and Pulles (1990 *In: Barbier, 1998*) and WRI (1992 *In: Barbier, 1998*), it is estimated that between 1945 and 1990 there was 494.2 million ha of human-induced soil/land degradation in Africa of which 320.6 million ha were classified as moderate/severe/extreme degradation and 173.6 million ha as light degradation. This amounted to 25% of the world's degraded lands. Also about 22% of the 494.2 million ha of degraded land was vegetated. The amount of degraded land would be significantly higher in 2005 from population and livestock increases, along with a general failure to intensify traditional extensive management systems in a sustainable manner.

Table 5.7: Extent and causes of declining soil fertility in Africa

Region	Extent of Human-Induced Nutrient-Related Soil Degradation (Millions of Ha)				
	Light	Moderate	Severer		
Africa	20.4	18.8	6.6		
Asia	4.6	9.0	1.0		
South America	24.5	31.1	12.6		
Human-Induced Causes of Soil Degradation (Percent)					
	Deforestation	Over-exploitation	Over-grazing	Agricultural Activities	Industrial Activities
Africa	13.6	12.8	49.2	24.5	----
Asia	39.9	6.2	26.4	27.3	0.1
South America	41.0	4.9	27.9	26.2	----
World	29.5	6.8	34.5	28.1	1.2

Note: Over-Exploitation is for fuel wood

Source: Oldeman (1992 *In: Gruhn, et al., 2000*) with permission, International Food Policy Research Institute (IFPRI).

Despite the cumulative effect of negative nutrient balances, overall yields in Africa have increased. From 1960 to the mid-1990s, wheat yields more than doubled from 0.7 to 1.8 metric tons/ha, while maize yields rose from 1.0 to 1.7 metric tons/ha (FAO various years). Together with the limited adoption of new technologies, the mobility of the Sub-Saharan Africa farmer has been a major factor in the improvement of production, albeit at the cost of soil degradation. Between 1973 and 1988, arable and cropped land increased by 14 million ha in Sub-Saharan Africa, while forest and woodland areas fell by 40 million ha, and pasture land remained stable. Thus, 26 million ha (the difference in total land use) have been lost to desertification or abandoned (Gruhn, *et al.*, 2000). Likewise, FAO (2002a) estimates that from 1961-1999 in Sub-Saharan Africa land expansion accounted for 35% of increases in crop production. “Desertification refers to land degradation in arid, semi-arid, and sub-humid areas due to anthropogenic activities” (UNEP, 1993; Darkoh, 1995 both *In: Eswaran, et al.*, 2001).

The effect of reduced soil fertility remains generally hidden because farmers abandon nutrient-depleted land to clear and farm uncultivated, marginal land (Gruhn, *et al.*, 2000). The question is how much more marginal land remains, and how much of this marginal land is critical for other uses such as wildlife, forestry, grazing, watershed protection, etc.? For instance in the Benin section of “W” National Park, tens of thousands of cattle invade the park each dry season since expanding agriculture excludes herders from former pastoral land on the park’s periphery (East, 2005). This is happening across the subcontinent. As people move onto land that is “marginal for agriculture”, they are moving onto land important for other uses, particularly conservation, and are thereby risking to create major conflicts for instance between small-scale farmers and pastoralists as has been happening in Kenya for the past 10-15 years (see Section 5.7.1.3, Improperly planned land tenure; impacts on wildlife, conflicts between

pastoralists and small-scale farmers, Amboseli and Maasai Mara and Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY). The cost of eliminating this nutrient depletion in Africa by using fertilizer would amount to US\$ 1.5 billion per year (Henao & Baanante, 1999 *In: Pinstrup, et al., 1999*)

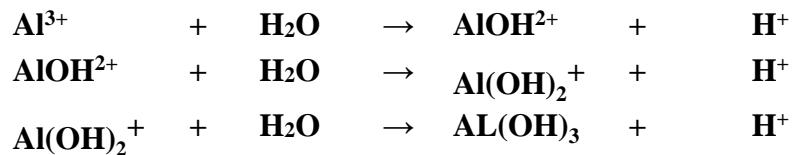
Dudal (2002 *In: Vanlauwe, et al., 2002*) also suggests that between 1986 and 1996, cereal production increased by 20-100% in 39 of 48 Sub-Saharan countries, showing that in addition to nutrient depletion issues, other factors such as new crops and stress-tolerant varieties may be just as important to increasing production and taking pressure off extensions into natural systems.

5.5.2.3 Nutrients, pH, acidity and carrying capacity

Cation Exchange Capacity (CEC) is the sum total of exchangeable cations (element with a positive electrical charge) that a soil can absorb, with a high cation exchange linked to increasing nutrient availability. Without negatively charged soils, soils would not retain cations and plant life as we know it would have a tough time existing. The ability of a soil to absorb and exchange nutrient cations is mainly derived from organic matter and clay minerals.

The relative size of soil particles from largest to smallest is: sand > silt > clay. Very fine soils like clays have a high CEC, whereas larger-textured sands have a low CEC. So many properties of the soil depend on the particle sizes of the soil, such as water holding capacity, nutrient holding capacity, carbon accumulation, and CEC. Soils which restrict water penetration to the topmost 20-30 cm (e.g. clay) are the most beneficial to grass cover (Smith, 1992).

Retention of nutrients is also closely related to soil pH. pH is a measure of the hydrogen ion activity in soil and water. It is mathematically related to hydrogen ion activity according to the expression $\text{pH} = -\log_{10} [\text{H}^+]$, where $[\text{H}^+]$ is the hydrogen ion activity. pH tends to correlate to acidity, the lower the pH the higher the acidity (USEPA, 1976). It can be measured electrometrically or colorimetrically (APHA, 1976). pH is an important factor in the chemical and biological systems of soil and water. The main cations in soil that cause acidity are H^+ and Al^{3+} . They are called “acid cations” because they tend to lower the pH of soil solutions. Once displaced by increasing acidity, aluminum ions can hydrolyze (i.e. split water), release H^+ , and further lower the pH increasing acidity (Carleton College, 2005):



Loss of organic cover from cultivation, over-grazing and resulting wind and rain erosion can result in a loss of buffering capacity setting up this chain reaction. Soils are acidic for several reasons:

- Their parent materials were acidic and relatively low in base cations (Ca^{2+} , Mg^{+2} , K^+ , Na^+), which tend to exist in compounds that raise the pH of soil solutions by neutralizing H^+ ;
- These elements have been removed from the soil profile by normal leaching from rainfall and harvesting of crops. Given other parameters as constants, as rainfall increases nutrient leaching tends to increase, resulting in grasses with lower protein content (Hagedorn, *pers. comm.*);
- Organic acids also contribute to acidity, especially in forested soils;

- Leaching of Al from the mineral soil crystalline lattice or exchangeable Al^{3+} on the soil surface; and
- The presence of exchangeable H⁺, such as from acid rain.

Soil acidity is a major growth-limiting factor for plants, and aluminum toxicity is often the main cause of acid-soil infertility. Sometimes, farmers mistake low crop growth and yield to a lack of nutrients when soil acidity is really the culprit. As the soil becomes too acidic or too alkaline, key nutrients become unavailable for uptake by grasses and/or crops (Hartmann, Kofranek, Rubatzkym & Flocker, 1988). For instance at pH's below 5, phosphates (H_2PO_4^- or HPO_4^{2-}) react with aluminum (Al^{3+}), iron (Fe^{2+}) and manganese (Mn^{2+}) to form insoluble hydroxyl phosphates making P unavailable to plants. As the pH rises above 7, phosphates react with calcium (Ca^{+2}) and magnesium (Mg^{+2}) to also form insoluble di-and tri-calcium and di and tri-magnesium phosphates also unavailable to plants. Thus at a pH between 6 and 7 the fixation of phosphates is minimal, maximizing its availability to uptake by plants. Nitrogen and sulphur become increasingly available from pH 4-5.5, after which they remain equally available regardless of pH (DAM, 2003). This impacts not only the productivity of the grasses, but the nutrient quality of the grasses for consumption. For example according to Smith (1992):

- Soils derived from volcanic rock (e.g., black cotton soils) such as the Serengeti Plains and Maasai Steppe in East Africa have a high cation exchange and can support a large herbivore biomass – resulting in low mobility required of wildlife and/or livestock;
- Soils derived from metamorphic substrates such as southern Tanzania, and Malawi have a lower nutritional status as well as certain trace element deficiencies (e.g., Miombo/*Brachystegia* spp. woodland savanna of Malawi is deficient in phosphates and calcium, therefore restricting pastoral use).

This can result in cattle eating dried bone from carcasses and dying from botulism poisoning. On the other hand, it may be acceptable to certain wildlife (e.g., Nyika Plateau, Malawi supporting reedbuck – *Redunca arundinum arundinum*);

- Soils of Zambia's savannas are generally nutrient deficient, producing the extensive grasslands of *Hyparrhenia spp.* and *Trichopteryx spp.*. The one exception is the Batoka Highlands on doleritic bedrock which is more productive;
- Soils of the Highveld of South Africa in Northern Transvaal (e.g., portions of the Limpopo, Gauteng and Northwest Provinces) and the Free State have a low nutrient status requiring considerable mobility by traditional pastoralists. Permanent grazing with modern fencing has resulted in tremendous bush encroachment; and
- Fynbos of the Western Cape, South Africa is deficient in cobalt producing anemia in herbivores. This traditionally required greater mobility by Khoikhoi herders to maintain herd quality and milk production.

“The Sahel zone of West Africa is particularly covered with sandy acidic soils with low buffering capacities” (CIAT, 2002).

Game is less sensitive to phosphate deficiencies than livestock, probably due to the fact that wild animals are better able to use natural salt licks and are also better able to select plant material of high nutritional value (Bothma, 1989). Today, nutrient deficiencies can be addressed with mineral and salt licks.

5.6 LAND DEGRADATION

Land degradation will remain an important global issue for the 21st century because of its adverse impact on agronomic productivity, the environment, and its

effect on food security and the quality of life (Table 5.8) (Dregne & Chou, 1994 *In: Eswaran, et al.*, 2001). According to Eswaran, *et al.* (2001) the compilers of Table 5.8, Dregne and Chou (1994), covered only dry areas, including rangelands. This would account for the reason why only 14 million km² is given as a total area for the African continent as opposed to the actual estimated area, which is between 29.8 million km² (Reich, *et al.*, 2001) and 30.3 million km² (Clark, Church, Davies, Hilling, Kenworth, McMaster, Stevens, Thorp & Turay, 1975).

Table 5.8: Estimates of all degraded lands (in million km²) in dry areas from unsustainable agricultural and landuse practices

Continent	Total area (km ²)	Degraded area † (km ²)	% Degraded
Africa (Dry Areas)	14.326	10.458	73
Asia	18.814	13.417	71
Australia and the Pacific	7.012	3.759	54
Europe	1.456	0.943	65
North America	5.782	4.286	74
South America	4.207	3.058	73
Total	51.597	35.922	70

† Comprises land and vegetation

Note: In Africa, desert and steep slopes, where agriculture is not considered possible except in limited areas (oases), do not appear to have been considered since they are not considered as agricultural lands. Likewise, high rainfall areas such as the Congo Basin would not have been considered.

Source: Dregne and Chou (1994) *In: Eswaran, et al.* (2001) with permission, International Center for Arid and Semi-arid Land Studies (ICASALS).

GLASOD⁵⁵ (1987) provides the following estimates of total land degradation (Table 5.9), 42% of Sub-Saharan Africa suffering from moderate to severe soil

⁵⁵ “UNEP’s (United Nations Environmental Program) recommendation led to the publication of a world map on the status of human-induced soil degradation at a scale of 1:10 million. This map is based on input from more than 250 scientists on soil degradation in the 21 regions into which the world was divided for analytical purposes. UNEP’s immediate objective in producing the map was to help decision- and policy- makers better understand the dangers of inappropriate land and soil management. GLASOD (Global Assessment of Soil Degradation) is criticized today as inaccurate, subjective, and not appropriate for assessing soil degradation at the country-level. Despite these drawbacks, it remains the only database to define the status of human-induced soil degradation and the extent of desertification at the global scale” (WRI, 2004).

degradation. Since this analysis was undertaken in 1987, about 18 years ago, it can be assumed that the level of degradation has increased significantly under low-input regimes (e.g., low amounts of fertilizer use) as fallow periods disappear and farmers move into more marginal areas.

Table 5.9: Land degradation severity by percent severity class

	None	Light	Moderate	Severe	Very Severe	Total Degradation: Light To Very Severe	Degradation: Moderate To Severe
Sub-Saharan Africa	33	24	18	15	10	65	42
North Africa & Near East	30	17	19	28	7	70	52
Asia & Pacific	28	12	32	22	7	72	61
North Asia. East of Urals	53	14	12	17	4	47	33
South & Central America	23	27	23	22	5	77	50
Europe	9	21	22	36	12	90	70
North America	51	16	16	16	0	44	29
World	35	18	21	20	6	65	47

Source: GLASOD (1987) with permission, UN & FAO.

About two-thirds (67%) of the world's agro-ecosystem has been degraded during the last 50 years (GEF, 2002). "Land degradation can be considered in terms of the loss of actual or potential productivity or utility as a result of natural or anthropogenic factors; it is the decline in land quality or reduction in its productivity" (Eswaran, *et al.*, 2001). Oldeman, *et al.* (1991 *In:* Eswaran, Beinroth & Reich, 1999a) suggest that about 17% of the global land area is degraded by human interventions. The consequences of land degradation not only affect the performance of the land for food and fiber production, but also have grave consequences for the environment, including biodiversity.

“Africa's natural resources are rapidly being degraded because the required increased production is being derived from extensification because markets are not rewarding intensive management. This degradation is manifested most noticeably in deforestation, genetic erosion and soil degradation, and particularly loss of organic matter, under agricultural and pastoral use. This degradation influences many other resources and environmental services of importance to sustainable development. It leads to serious distortions in the hydrological balance, impaired access to water resources, continuing loss of plant genetic resources and encouragement of noxious weed (often exotic invasives) populations. In extreme cases, the loss is irreversible, resulting in the extinction of races of precious indigenous food crops and other useful plants. It is estimated that about 0.7% of forests in Africa are lost each year. Degradation of cropland is severe in Africa, affecting more than 65% of cropped area. Degradation of pastureland is also severe, affecting 31%. The loss to the continent's economy from these sources is incalculable” (NEPAD, 2002).

According to other accounts, 72% of African arable land has already been degraded as a result of soil erosion (Naseem & Kelly, 1999). The United Nations (Hawley, 2004) projects that by 2025, 67% of the arable land in Africa will disappear. The two areas of Africa that are extremely vulnerable to soil erosion are (de Vos, 1975):

- The “tropical belt” (“tropical savanna” or “summer rainfall climate” including most of Mali, Niger, Nigeria, Chad, Ghana, Togo, Guinea-Conakry, Cameroon, RCA, southern Sudan, Tanzania, Uganda, Kenya, DRC, Zambia, Mozambique, Zimbabwe and a portion of South Africa, where the clearing of vegetation exposes the soil to torrential rain and the leaching of nutrients. During the dry season wind erosion and/or baking of the soil takes place so plants cannot push through.
- The “arid belt”, the desert to the north and in Sub-Saharan Africa, the Sahel from Senegal across to Sudan, where daily temperatures are extreme

and commonly rise above 38° C. There is also a lack of soil humus and poor soil texture. Through evapotranspiration and osmoregulation, salts are brought to the surface of soils, making irrigation and the mitigation of this problem very expensive and in many cases uneconomical.

Where poor soil conservation and management methods prevail, long-term productivity is projected to decline substantially unless soil management practices improve. In Africa (Dregne, 1990; Lal, 1991 both *In: Gruhn, et al., 2000*) and Asia (Dregne, 1992 *In: Gruhn, et al., 2000*), past erosion has reportedly reduced average crop yields (per ha)⁵⁶ by 10 to 20% over the past 100 years. If erosion at this rate continues unabated, crop yields may decrease by another 16.5% in Asia and 14.5% in Sub-Saharan Africa by 2020 (Scherr & Yadav, 1996 *In: Gruhn, et al., 2000*). “Yield reduction in Africa (Lal, 1995 *In: Eswaran, et al., 1999a*) due to past soil erosion may range from 2 to 40%, with a mean loss of 8.2% for the continent. If accelerated erosion continues unabated, yield reductions by 2020 may be 16.5%. Annual reduction in total production for 1989 due to accelerated erosion was -8.2 million tons for cereals, -9.2 million tons for roots and tubers, and -0.6 million tons for pulses” (Eswaran, *et al.*, 1999a).

The main causes for degradation are 1) increased demand for food for a rapidly growing population; resulting in intensification of agriculture and shortened fallow periods without appropriate inputs; 2) inappropriate agricultural policies such as subsidies for water, fertilizers, and other agrochemicals, leading to wasteful use; 3) use of agricultural machinery and agronomic practices that are unsuitable for local soil and water conditions as well as the social and economic situation; and 4) in arid and semi-arid areas, a high concentration of livestock, leading to over-grazing. The adverse impacts of land use and land use change

⁵⁶ Note: Food production in Sub-Saharan Africa increased by 25 % in the last two decades (see Section 5.3.3, Food Security in Africa), though this is different than yield, with increases in food production coming from extensification into marginal agricultural areas, which may serve as key centers of biodiversity.

include soil degradation-erosion, salinization, nutrient depletion, chemical pollution, and the loss of biodiversity, especially biodiversity of importance to agriculture (GEF, 2002). Some believe that it is impossible to have environmentally sound resource management under conditions of high population growth, scarce resources and the absence of alternatives to subsistence agriculture (Moorehead & Wolmer 2001 *In:* Devereux & Maxwell, 2001a).

In the context of productivity, land degradation results from a mismatch between land quality and land use. Mechanisms that initiate land degradation include physical, chemical and biological processes. Soil structure is the important property that affects all three degradative processes. However, land degradation as a biophysical process driven by socioeconomic (e.g. land tenure, marketing, institutional support, income and human health) and political causes (e.g. incentives, political stability) (Eswaran, *et al.*, 2001) may be just as important an incentive or disincentive to sustainable resource management and a cause for declining food production (see Section 5.7, POLICY REFORM CONSTRAINTS TO AGRICULTURAL PRODUCTION). Virmani, Katyal, Eswaran and Abrol (1994 *In:* Reich, *et al.*, 2001) also identify other causes for land degradation, such as drought, failure to implement appropriate technologies, poverty, constraints imposed by recent international trading agreements, and local agricultural and land use policies. For instance, in western Kenya, resource-poor households, compared to wealthy ones, made only 5% of the farm investments, had over twice the erosion rates and 28% of the maize yields. These resource-poor households constitute 90% of the population (CIAT, 2002). Government land tenure policies are especially important, taking common property managed at the local level by the chief and elders to open access property owned and handed out by government, often promoting failed large-scale government irrigation parastatals at the expense of traditional farmers and/or commercial farmers.

Losses from soil degradation are not unique to Africa, “It is estimated that the total annual cost of erosion from agriculture in the USA is about \$US 44 billion/year, about \$US 247/ha of cropland and pasture” (Eswaran, *et al.*, 1999a). In the soil conservation conscious United States, an estimated 1.3 billions tons of soil are lost each year along with associated fertilizers and pesticides. The declines in soil erosion in America over the last 60 years have primarily been due to the creation of local soil and water conservation districts to educate farmers in how to reduce erosion and protect streams, taking the most vulnerable lands out of production. This loss of soil along with expanding urban populations in the U.S. will decrease the land available for food, while overall populations increase. This will increase the need for soil conservation efforts giving incentive payments to farmers who adopt corrective measures. This approach is thus one of conservation through subsidization (Mast, 2003), which World Bank/IMF structural adjustment programs dissuade in Sub-Saharan Africa (see Chapter 12).

5.6.1 Colonialism and its Impact on Land/Soil Degradation and Agriculture in Sub-Saharan Africa

“In South Africa few white men have either the time, the patience, the understanding or the sympathy even to attempt to regard things from the native’s point of view, and this failure is the source of a general popular misunderstanding of his character and temperament...Recent experiences in South Africa (brain capacity and mental level) do not support this assertion, for it has there been deemed necessary to limit strictly the industrial native’s sphere of labor” (Stevenson-Hamilton, 1929).

Prior to colonialism, low human populations practiced extensive fallow agriculture and nomadism, ecologically controlling their landscape to suit their needs (e.g., pushing back the bush and the tsetse fly in favor of grasslands, fallow

agriculture, etc.) (see Chapter 2, Section 2.3.3, Fallow Agriculture in Low Productive Areas).

This changed by the mid-19th century with the arrival of European powers in Africa. Colonial agricultural policy makers were convinced that the main problem of the African agricultural system and a major limiting factor to increasing agricultural production was the customary land tenure system. Customary tenure was blamed for the lack of interest and lack of attention given to land conservation and improvement issues, the lack of security to investors in the agricultural sector, and the difficulty of obtaining credit since land could not be mortgaged (Tonah, 2002).

East and Southern Africa tended to become settler colonies which displaced indigenous farmers to “homelands and reservations” (IFAD, 2002), while West and Central Francophone Africa co-opted traditional leaders into using their constituents to produce cash crops while maintaining indigenous institutions and land tenure systems (IFAD, 2001).

The colonial powers forced rural populations to produce cash crops through imposed taxes. Cotton, coffee, cotton wool, rubber, etc. were sold at set prices to the colonial powers. In East and Southern Africa, colonial governments established mechanisms to assist European settlers (the high point of whose influx was often after World War II). They also provided incentives for production, through pricing policies and monopoly control of most farm commodities, whether for export or for domestic trade. African farmers were often debarred from using the legal marketing channels and had to sell whatever surplus they had to nearby large-scale (European) farmers or the informal market, but always at lower prices (IFAD, 2002).

Very often, lacking a clear understanding of soil ecology and carrying capacity, European interventions resulted in environmental degradation that the African people had not known. “ ‘But here in Africa it (cash crops) has destroyed the land, it has destroyed the people, it has destroyed the future for very short-term and long-term benefits’ ” (Robert Ndaw, former Malian minister directing the UN Environmental Program’s Desertification Center in an interview with the BBC in 1986 *In: Rosenblum & Williamson, 1987*).

These and other interventions resulted in: 1) land compression from Africans being squeezed into smaller eventually unsustainable areas (e.g., tribal trust lands, communal areas, or Bantustans) in favor of large privately owned European plantations and national parks/game reserves, turning farmers into manual laborers on the plantations or in mines, etc. (see Chapter 3, Section 3.1.7, Colonial Economies and Section 3.4.1.2, Centralization of control over wildlife, South African Republic) 2) the introduction of industrial mono-culture plantations (peanuts, palm oil, rubber, coffee, tea, sugar cane, tobacco, banana, timber, etc.) and cash crop economies to replace traditional food production. This adversely impacted on the nutrition of rural Africans, and 3) improved animal husbandry resulting in an explosion of livestock combined with the slow elimination of nomadism. This took extensive pastoralists into intensive management systems for which they were technically ill prepared (see Chapter 6). The dual system of colonial paternalism and *laissez-faire* private enterprise ended Africa as a “Garden of Eden” and resulted in a rapid deterioration of the land and, to some extent, the whole structure of society (de Vos, 1975; Martin & O’Meara, 1995; IFAD, 2002; Madeley, 2002; Tonah, 2002).

Raw agricultural products (e.g., coffee, cocoa, tobacco, tea, etc.) were then sent to the home country where the “added value of transformation” was obtained, and often sold back to the producing country at a higher price. This is one reason for

the extremely low level of development in many Least Developed Countries (LDCs), particularly African countries, most of which only gained their independence in the last 40-50 years (Copeland, 2000).

When black leaders came to power in the 1950s and 60s, the system was firmly in place. Cash crops became the cornerstone of African agriculture, and peasant farmers – still nearly 70% of the population – were seen as a sign of all that was wrong with African farming; technically backward, unsophisticated and unproductive (Elwood, 1984). Policies of post-independence governments in the region generally continued the bias against smallholder agriculture. They used the marketing and control systems (e.g., coffee and livestock marketing boards) they had inherited to purchase export crops from farmers at low prices and sell them at higher world market prices, allowing corrupt officials and politicians to line their pockets. In many countries, the government also controlled the marketing of food for the population. This allowed them to keep urban food prices artificially low in the interests of cheap labor, and to maintain peace and quiet in the cities and towns where political pressures were more likely to form (IFAD, 2002). All of this was to the detriment of the small-scale farmer.

In many ways, a contemporary map of Africa remains a colonial map with little relation to indigenous concepts of space (e.g., ethnic areas such as the Maasai, which now straddle two countries, or traditional kingdoms, which were destroyed). Most present-day urban centers and transportation systems were designed with colonial objectives, namely the development of efficient economic exploitation as part of an export-oriented primary producing economy to supply raw materials and agricultural products (Martin & O'Meara, 1995) for added value in the West, but with little opportunity for internal circulation of goods or people.

5.6.1.1 Impacts of colonialism on agriculture and pastoralism in the Sahel

The Sahel forms a broad band stretching across West Africa between the rainfall isohyets of 200 mm to 400 mm/year (see Chapter 1, Figure 1.3: The Sahel).

“Non-irrigated agriculture in the Sahel is only possible in areas where the length of the growing season allows crop maturation. The lack of water, in association with high temperatures (up to 45°C at certain periods of the year), is the most limiting factor for agricultural productivity in the region. Rainfed and recessional (floodplain) agriculture are the dominant practices. In the arid zone, millet and sorghum are cultivated near water points. In the semi-arid zone, the important food crops are millet, sorghum, cowpeas and maize. Sorghum predominates in the heavier soils and millet in the sandy soils” (Moore, Bertelsen, Diarra, Kodio, Cissé & Wyeth, 2000) (see Chapter 1, Table 1.1).

The first chapter of this book, which deals with ancient Sahelian civilizations, has shown that desertification was already occurring in the Sahel, in the 15th and 16th centuries because of human mismanagement of resources. It can be argued that colonialism helped accelerate this process.

Hardin (1977) attributes acceleration of the physical destruction of the Sahel to the loss of political power and control over natural resources by the Sahelian peoples under French colonization during the late 19th century. West African civil society was suppressed by a highly centralized formal regime instituted under colonialism that has largely been maintained under nearly 40 years of independence. This highly centralized structure dominated customary local governance, constraining it to the village arena (Moore, *et al.*, 2000).

While one cannot blame the collapse of the integrated social and ecological system solely on Western interventions, few of these have favored the local inhabitants of the Sahel. Such interventions resulted in destructive practices from the cumulative effects of over-population, deteriorating climatic and soil conditions, and, above all, the adverse impact of Western economic and social systems imposed upon Africa (Hardin, 1977).

“It has been the West's deliberate attempts to do well that seem to have caused the most harm. The West in this case means the French, up until 1960, when the Sahelian countries were granted independence, and the French, Americans, and others thereafter. The French should probably not be held particularly to blame; they were only following conventional wisdom, and there is little reason to believe that other donor countries would have handled the situation very differently...Introduction of a cash economy by the French to earn foreign exchange had profound effects on the traditional system. At the same time, the population increase led to more and more people trying to farm the land. With the best lands given up to the cultivation of cotton and peanuts, people had to bring the more marginal lands into use to grow their own food crops. In many cases these ecologically fragile zones could not take the strain of intensive agriculture. The usual process is that the fallow periods of 15 to 20 years are reduced to five or even one. Fertility declines, slowly at first, and then in a vicious spiral. Poor crops leave the soil exposed to sun and wind. The soil starts to lose its structure. The rain, when it falls, is not absorbed but runs off uselessly in gullies” (Hardin, 1977).

Little emphasis was placed on improving agricultural production of food crops as a means of improving nutrition, or on the development of industries (Dumont, 1966), especially those linked to transforming agricultural produce on the continent that would have stimulated African economies.

The Sahel enjoys only about four months of rainfall a year. Traditionally, the grasses were sufficient to support herds of cattle tended by nomads (e.g. Fulani, Tuareg, etc.), and in the southern regions, the cultivation of millet and sorghum, together with cash crops such as peanuts and cotton took place. By 1970, just before the collapse of agriculture brought on by a major drought, the fragile steppe and savanna ecology of the six Sahelian countries (Senegal, Mauritania, Mali, Burkina Faso, Niger and Chad – see Chapter 1, Figure 1.3: The Sahel) was supporting some 24 million people and about the same number of animals. This burden amounted to roughly 33% (a third) more people and twice as many animals as the land was carrying forty years before in the 1930s (Hardin, 1977). To this, one could add Gambia, the Sahelian parts of Nigeria, Cameroon, Chad, the Central African Republic and Sudan.

“If the nomads could have been persuaded to kill more of their cattle for market, the animal population might have been kept within bounds. Not foreseen was the fact that cattle are the nomads' only means for saving, and it in fact makes good sense -- on an individual basis -- for a nomad to keep as many cattle on the hoof as he can. As a result herd numbers increased hand over fist in the decade following independence, aided by 7 years of unusually heavy rains; from about 18 to 25 million between 1960 and 1971. The optimum number, according to the World Bank, is 15 million...The French colonial division of the Sahel into separate states has also faced the nomadic tribes with national governments which have tried to settle them, tax them, and reduce their freedom of movement by preventing passage across state boundaries” (Hardin, 1977);

this freedom of movement being necessary to assure the sustainable use of the Sahel's grasslands. Increasing numbers of Nomadic herders in the Sahel region, ever more impoverished because of drought and the expansion of arable agriculture, have been forced to graze their herds on fragile grasslands.

“Mobility has given way to more permanent cultivation and restrictions on animal movements. Due to the scarcity of unused arable land, farmers have reduced or eliminated fallow periods and extended cultivation into marginal areas that had been reserved for pastures and forests. The resulting loss of pasture and firewood has led farmers to use their crop residues for animal feed and cooking, and as the trees, bushes, and crop residues that helped to anchor the soils have been depleted, wind and water erosion have carried away topsoil” (FEWS, 1997).

In some cases, crop residues have been used as a source of fuel, no longer being available as dry season fodder for livestock. In Sub-Saharan Africa, excluding South Africa (14% traditional fuels), traditional fuels (e.g., crop residue, dung, charcoal and firewood) account for over 60% of primary fuel⁵⁷ used and may be as high as 70% in Sudan and 90% in countries like Burundi and Burkina Faso (Sokona, 2002).

“...in many areas wood-fuel resources are under severe pressure, a fact reflected in the growing use of inefficient and unhealthy non-woody biomass resources such as animal wastes and crop residues in some rural areas, and increasing prices for woody biomass in most urban centers” (Sokona, 2002).

The increasing use of dung and organic residues (crop residues, nitrogen fixing trees as *Acacia albida*) as fuel contributes to deteriorating soil fertility and declining agricultural productivity.

The loss of floodplains from dams and the attempted conversion of these areas to irrigated agriculture decreased and/or eliminated dry season forage areas for migratory pastoralists such as along the Senegal River, Volta River and Logone River. Dams across Africa have had a major adverse impact on traditional

⁵⁷ Other fuels include petroleum, gas, coal, electricity (hydro?)

pastoralism and other traditional sources of food production such as fishing and recession agriculture (see Chapter 7 on Dams).

In addition, “what cash crops have done for the Sahelian farmland, deep borehole wells have done for the pasture. A thousand feet or more beneath the Sahel lay vast reservoirs of water that can be tapped by deep wells. Well-intentioned donors have drilled thousands of these boreholes, costing up to US\$ 200,000 apiece, across the Sahel. The effect of the boreholes was simply to make pasture instead of water the limiting factor on cattle numbers, so that the inevitable population collapse, when it came, was all the more ferocious” (Hardin, 1977), (see Chapter 6 on Boreholes and Watering Points).

“Consequently, there has been a decline in the productivity of the livestock sector as well as a low output for the rain-fed cereal crops, estimated around 0.3 ton/ha in the Sahel zone, 0.5 ton/ha in the Sahel-Sudan zone, 0.7 ton/ha in the Sudan zone and 0.9 ton/ha in the Sudan-Guinean zone” (CORAF/WECARD, 2002).

However, de Haan, Steinfeld and Blackburn (1997) argue that

“livestock production in five Sahelian countries over a 30 year period, carried out as part of this study, shows a 93% increase in the meat produced/ha, and 47% increase in the meat produced/head. At the same time, there was a 22% increase in the animal population (from 14.5 to 17.6 million TLU⁵⁸) over the same period. This productivity increase occurs in both cattle and small ruminants. Part of the increased productivity may be the result of a progressive shift of the livestock population to the higher potential areas in more humid zones, and the increased use of crop residues” (see Chapter 6, Section 6.1.4.1 Impacts on pastoralism and range ecology from increases of human and livestock populations in the 20th century).

Groundnuts, Mourides and Land Degradation in Senegal

⁵⁸ Burkina Faso, Chad, Mali, Niger, Senegal and Sudan

Peanuts/groundnuts were introduced to Senegal by the French as a source of peanut oil for the mother country and were promoted by the newly independent government as a major source of foreign exchange (Figure 5.5). Boone (2003) explains that under colonialism beginning in the 1920s the French moved from power sharing with a decaying Wolof aristocracy to the charismatic Sufi *confréries* (brotherhoods) of Mourides and Tidjane who cleared forests, established farming communities and devoted themselves to prayer and the production of groundnuts. Old forms of political structuration under the Wolof Empire [see Chapter 1, Section 1.4.7, Wolof (Djolof) Empire] were transformed from the political to the religious realm as well defined *maraboutic* hierarchies of *grand kalifs*, the *grand kalifs'* eldest sons, and key lieutenants who made up a stratum of *grand marabouts* reaching all the way down to the village level chieftaincies, a quasi-feudal system encouraged by the French (Boone, 2003). “Traditionally, Muslim land tenure rules favor crop farmers over pastoral herders in access to land because ‘laying of the hand’ (e.g., evidence of use) confers exclusive ownership” (de Haan, *et al.*, 1997).

The *marabouts* of the Muslim sect of Mourides in Senegal can be considered an elite who control national, regional and local politics. They use their followers, the *talibés* (disciple or student) as tenant farmers who cultivate without pay (Dumont, 1966; Boone, 2003). In a process of land pioneering, unemployed warriors and freed slaves clear the bush, and cultivate the *marabout*'s fields for ten years after which they receive land of their own. In addition, each village collectively cultivates a field of which the harvest goes to the *marabout* with the income of lower level *marabouts* making its way through the hierarchy to the top (Boone, 2003). This has helped finance the “*Grand Mosqué*” of Touba (Dumont, 1966) though Boone (2003) states that France also helped fund its construction in the French government's alliance with the Moslem holy leaders as a means of controlling the economy. France used its alliance with the Mouride marabouts to

increase the powers of an alien colonial state and expand export-crop production. Groundnut cooperatives *Société Indigènes de Prévoyances* (SIPs) controlled by marabouts directly taxed Senegalese peasants and provided inputs and loans, while at the same time subsidizing “maraboutic estates” and eventually expropriating land from Peul/Fulani pastoralists in the Ferlo beginning in the 1930s. This included the cutting of roads and digging of boreholes by French colonizers to facilitate this expansion of *terres neuves* (new lands). Eventually, *forêts classés* (classified forests) were created to provide some grazing habitat for the Fulani pastoralists, though in the 21st century these forests are under assault as described below (Boone, 2003).

René Dumont (1966) argues that turning Senegal into a peanut and cotton cash crop economy resulted in the displacement of sorghum and millet food cereals. He goes on to say that as a result of this policy, there was a high incidence of young people suffering from protein deficiency or kwashiorkor, who were characterized by reddish hair and distended bellies. This illness resulted in them becoming physically and mentally scarred for the rest of their life, even if they recovered.

At the principal author’s arrival in Senegal in 1977, because of these relationships and the general over-population of the country resulting in reduced fallow periods, and inappropriately managed boreholes, Senegal as a whole was a degraded habitat, and was with the exception of the extreme southeast, devoid of wildlife other than crop pests consisting of warthogs, hare, dove/pigeon, quelea, francolin and a few guineafowl. It was heading towards desertification and the marginalization of its people. Some call Senegal’s Groundnut Basin “*désert arachide*”, the groundnut desert (Rosenblum & Williamson, 1990). Boone (2003) argues that Senegal’s 1964 *Loi sur le Domaine National* (National Domain Law) also discouraged fallow since the *Conseils Ruraux* (Rural Councils), consisting

of about 35-50 villages, five groundnut cooperatives and 10-25,000 people, were controlled by the *marabouts* and their followers and could confiscate any land that appeared to be under- or unutilized. Meanwhile, the 1964 *Program Agricole* (agricultural program) provided fertilizers, seeds and extension that were diverted mostly to the lands of village leaders and *marabouts*, while the peasants were never paid enough by the groundnut marketing boards to cover the costs of inputs and credits. By the end of the 1960s, peasants accepted credit, refused fertilizers, began prioritizing food crop production and sold groundnuts on illegal parallel markets.

According to René Dumont (1966), it was typical for land to be cultivated for peanuts with no fertilizer for three years, after which the earth was greatly depleted and the capacity to retain water diminished. The *marabout* would then force out neighboring farmers and cultivate their land until it was in ruins. The *marabouts* tended to invest their profits into urban businesses to the detriment of agriculture and industrial progress. In fact, Boone (2003) suggests that *marabouts* began shifting to commerce in the mid- to late 1970s as the groundnut (peanut) economy continued to decay into the 1980s and 1990s, at the same time employing members through a patronage system of import-export circuits that circumvented Senegal's trade laws. Speaking on the *Grand Mosqué* of Touba "an image comes to mind, that of a mosque built by ruining the surrounding earth, a mosque that will ultimately look over a man-made desert", and yet these very *marabouts* could serve as tools to transfer sustainable agricultural technology to their followers (Dumont, 1966).

The National Domain Law and the Rural Councils permitted *marabouts* to continue land pioneering into the 1990s, reallocating unused or under-utilized land that was critical to Peul/Fulani pastoralists (Boone, 2003). In 1991, the Senegalese government granted the Khalifa General (Supreme Head) of the

Mouride Islamic Brotherhood permission to plough more than 60% of the Mbégué forest reserve (located between the towns of Kaolack and Linguere) into peanut fields.

A year later (shortly before the national elections) the Mouride leader urged his followers to support Abdou Diouf in his bid for re-election as President of Senegal (Freudenberger, 1995).

“Following the orders of their leader, Serigne Mbacké, within a matter of weeks his followers cut down more than 5 million trees and brutally expelled more than 6,000 FulBe (Fulani/Peul) pastoralists and 100,000 cattle from the forest. Two months later, the rains began: the once-lush pastures were ploughed under and the land planted with a vast plantation of peanuts” (Freudenberger, 1995).

This forest lies just south of the Sahelian Ferlo in the heartland of central Senegal, where Fulani and their humped-backed Zebu cattle and farmers are colliding, as all across the Sahel. The Mbégué Forest, until it was destroyed, was a *forêt classé* established during the colonial era, where farming was prohibited, but grazing was allowed, serving as “insurance pastures” for Fulani and their livestock during dry years, with 38 watering points of which 35 are today surrounded by peanut fields. In the 1950s, boreholes were drilled 200-300 meters in the areas at 30 km intervals, resulting in the Fulani becoming sedentary around the boreholes, with some of the men moving the cattle during the dry season, depending on available pasture and/or temporary water (Freudenberger, 1995).

“In the first major Sahel drought (1972/73) following the FulBe settling around the boreholes, many families thought they could depend on the wells and not move south. They suffered tremendous loss of animals due to shortage of grass even when water was sufficient for drinking. In the next drought (1983) they revived their traditional strategies and moved south. They lost

fewer livestock and recovered more quickly from the disaster” (Freudenberger, 1995).

Chapter 6, Section 6.1, IMPACTS OF BOREHOLES ON PASTORALISM provides additional discussion on the impacts of boreholes on livestock and their habitat. Similar observations were made by a Fulbright scholar in Senegal in the mid-1980s about the elimination of classified forests further south, linked to charcoal production (see Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal linked to charcoal making, over-population and declining fallow periods).

Today, the Fulani of Senegal are being compressed from all sides, with the significant reduction in flooding from the Manantali Dam along the Senegal River, orchards and gardens to the west of the Ferlo along the coast for winter vegetables and fruit for Europe and Dakar. As lands further south are degraded and population pressures increase, farmers are tempted into areas previously considered too dry for agriculture. Each year new fields are cleared around the boreholes, blocking access routes used by cattle as they move from one pasture area to another and creating bitter conflicts between herders and farmers. Much of the new settlement in the region is organized by the same Mouride sect that took over the Mbegué forest lands. Bureaucrats in Senegal’s capital, Dakar, argue that concern for the Fulani’s nomadic lifestyle is a sentimental attachment to an archaic way of life, not understanding the role of nomadism in the management of these savanna ecosystems. Meanwhile, the growing of peanuts in these sandy soils is resulting in major soil degradation as the entire plant is uprooted at harvest, opening these peanut fields up to major soil erosion, especially aeolian from the Harmattan winds (Freudenberger, 1995).

“When the FulBe can no longer move their cattle in search of better pastures, they will be driven to a different kind of migration;

a path which will take them to the crowded slums of Dakar” (Freudenberger, 1995).

Before that, the process of desertification will likely occur.

5.6.1.2 Impacts of colonialism on traditional agriculture in the Zambezi Delta of Mozambique

In the 16th century, Portuguese settlers arrived, confiscating land and co-opting labor. Land was organized as *prazos*, parcels handed to individual white settlers, granting the owner powers over the local chiefs, taxes and the trade in slaves. Agricultural productivity was low, producing sesame, coconut, copra and groundnuts that were traded for gold, ivory and cattle. The *prazo* communities pushed for independence similar to the original chieftaincies (Isaacman, 1972 *In:* Beilfuss, Bento & Dutton, 2001). Eventually, however, the central government gained economic control of the *prazo* system through the development of port facilities and land concessions for plantation agriculture. By the end of the 1800s, Africans were denied individual property rights, which were given to foreign companies to develop plantation agriculture. The first commercial farm, the Mozambique Opium Cultivating and Trading Company at Mopeia, was established in 1870. The first sugar processing plant started production in Mopeia in 1893. In 1920, the Sena Sugar Estates were founded, and by 1930, the estates had acquired more than 100,000 ha of the most fertile agricultural lands of the Zambezi Delta, near Marromeu, Luabo and Mopeia. Cotton was introduced as a compulsory crop in 1926 and rice in 1941 (Beilfuss, *et al.*, 2001). The introduction of compulsory cotton growing by Africans made the estates fear a loss of labor (IFAD, 2002). To comply with the government’s cotton directive and avoid labor shortages, the estates gave cottonseeds only to women! At peak production, 346,000 ha of delta lands were in cultivation, with more than 293,000 ha (85%) of the total titled for the commercial production of cash crops and

livestock under the Sena Sugar Estates, Madal Society, and others (Beilfuss, *et al.*, 2001). Another threat to labor availability was the growing of maize by Africans, since they could sell it instead of working for the plantations. In 1936, the government explicitly excluded Africans from commercial maize growing, thus securing a protected market (and labor supply) for estates and settlers (IFAD, 2002). The allocation of land to commercial farms pushed small landowners onto marginal lands and later reduced the size of lands available to them. Landholding size per family in the delta eventually decreased from 15 ha in the 1930s to less than one ha during the 1970s (Negrão, 1995 *In:* Beilfuss, *et al.*, 2001). Tinley (1977 *In:* Beilfuss, *et al.*, 2001) attributes this increasing land use pressure among rural villagers for clearing the remaining riverine and forest vegetation in the Delta. Firewood (cordwood) demands for the sugar processing plants further contributed to local deforestation (Beilfuss, *et al.*, 2001).

5.6.1.3 Impacts of colonialism on traditional agriculture in Malawi (Nyasaland)

In Nyasaland (Malawi), large tracts of land were ceded to plantation owners (white settlers) forcing Africans to pay rent in the form of labor known as *thangata* (30 days labor). Peasant farmers were removed from good land, which was given to the plantation, to poorer lands. As a means of encouraging people to work on the plantations, people living on Crown Land (off the plantations) were forced to pay a hut tax of six shillings, the equivalent of 30 days labor, which was waived if they could show that they worked on the plantations. In 1906, peasant farmers cultivated cotton, thereby raising money to pay the hut tax. By 1912, the basic configuration of the present Malawi agricultural sector had emerged; this was an estate sector in the Shire Highlands producing cotton and tobacco, a cash-cropping peasantry using hoe cultivation to produce cotton, tobacco, groundnuts, maize and other crops and seeking employment when needed, and a large reserve

of migrant labor from the north and central districts of the country, where plots were too small to enable the peasants to meet the tax and financial obligations created by the colonial regime (IFAD, 2002).

5.6.1.4 Impacts of colonialism on traditional agriculture in Zambia (Northern Rhodesia)

In Northern Rhodesia (Zambia), 9 million ha (6% of the country) were set-aside for white farmers along the railway line in the 1920s. By 1940, only 800,000 ha had been taken up by 260 white farmers, clearing only 28,000 ha. This resulted from a failure to develop a viable export crop. Maize became the principle crop, of questionable viability, to feed the internal domestic market and mining industry of the Copper Belt. Fixed pricing and a single marketing channel, often denied black farmers, was the British system used to favor white settlers in commercial endeavors (IFAD, 2002).

5.6.1.5 Impacts of colonialism on traditional agriculture in Namibia

Only achieving independence in 1990, Namibia's land distribution system is a reflection of its colonial past. In 1994, 4,045 white farmers owned about 45% of the total land and 74% of the land suitable for farming. The remainder was used by 120,000 black families. Black communal areas contained 33 million ha, while white farms controlled almost 35 million ha. Whites represented at most 7% of the population; blacks at least 93% (IFAD, 2002).

5.6.1.6 Impacts of colonialism on traditional agriculture and dongas in Lesotho (British Basutoland)

To avoid cattle raiding and the slave trade by marauding Griqua, European and Khoisan horsemen and Zulu expansion, *mfecane*, the Basotho chief, Moshoeshoe, led his people onto the Thaba Bosiu Mesa in 1824. This was a defensive high ground with pasture in the Drakensberg Mountains, while below lay the region's best-watered lowlands where mainly women with hoes cultivated sorghum and maize. Through his military leadership with cattle as social capital, Chief Moshoeshoe forged the Basotho nation (McCann, 1999). Traditional land management is described in Chapter 2, Section 2.3.1, Land.

By the 1830s, the mark of the Voortrekkers (white Afrikaners of mixed Dutch, German and Huguenot descent) began to be felt as they sought out rangelands for their cattle. In 1838, after the Zulu chief Dingane had murdered the Afrikaner Piet Retief and his delegation seeking land, the Zulu were defeated at the Battle of Blood River. As these settlers arrived at the edge of Lesotho's territory, Moshoeshoe welcomed them. In 1846, the Afrikaners (Boers) founded the town of Bloemfontein, "fountain of flowers", close to Thaba Nchu controlled by Moshoeshoe (McCann, 1999).

Eventual struggles over borders were really struggles over the control of land and other natural resources (e.g., water). In 1843 and 1866, war broke out between the Boers and the Basotho as the Boers pushed into Lesotho territories and incidences of cattle theft increased. In order to protect itself, Lesotho requested help from and was annexed by Great Britain in 1868. By the time it was all over, the Basotho had lost one of their most fertile pieces of land, the Caledon Valley, which they had controlled since the 1830s (McCann, 1999).

By the mid-1850s, missionaries introduced the ox-drawn plow, as well as exotic crops and livestock that were to have a major impact on long-term soil conservation in Lesotho. The ox-drawn plow allowed for a dramatic increase in

agriculture to supply the Kimberley diamond mines discovered in 1867 and the gold mines of Witwatersrand (Johannesburg area) (McCann, 1999) beginning in 1886. By the 1890s Lesotho had entered into the international market to such a degree that the production of wheat, maize, Merino sheep and Angora goats exceeded its production of the food staples of sorghum, milk and cattle (McCann, 1999).

By 1873, 15,000 Basotho worked in diamond mines, the number increasing to 30,000 by 1886. By 1920, only 20% of the adult males were employed in agriculture. This placed agriculture, predominantly in the hands of women who shifted from labor-intensive wheat, which could be more cheaply imported from overseas, to low-labor maize. By 1930, Lesotho became a net importer of grain. By 1970, only 6% of the rural household income was derived from domestic crop production, the majority of the population living on remittances sent by men working in South Africa's mines (McCann, 1999).

Missionaries eliminated natural trees such as wild olive (*Olea africana*) in building schools and churches at mission stations and introduced exotic trees (poplar, *Eucalyptus*, Blue Spruce, Peach, etc.). Prior to plowing, the grass fields were burned, killing native trees and shrubs, while reducing indigenous vegetation to protected streambeds and mountainous ravines. By 1900, profound changes in the landscape were being observed in the disturbance of Lesotho's fragile piedmont soils due to the entry of Lesotho into southern Africa's modern political economy (McCann, 1999). :

- Imported sheep and goats over-grazed native grasses resulting in succession to less-palatable grasses;
- The cultivation of winter wheat associated with mission stations introducing plow agriculture;

- Maize replaced sorghum as the dominant national food crop; and
- Sledges and ox carts along cattle tracks reduced ground cover.

All of these activities, along with fire, exposed these fragile soils to torrential rain runoff resulting in gully erosion and the formation of “*dongas*”,⁵⁹ especially around mission stations. When *dongas* appeared, farms were no longer the primary source of livelihood. Soil conservation by colonial administrators, beginning in the 1930s, made matters worse and is a root cause of the *dongas* observed in the 1990s (McCann, 1999), as described below.

As in West Africa, the problem was not one of degraded conditions from traditional land use, but land compression, introduction of exotic cultigens, pushing local people into a moneyed economy, introduction of new technologies and little understanding of soil chemistry or physics by the colonial masters. In Lesotho, between 1935 and 1964, 207,872 ha had been terraced with 42,747 km of terraces, 2,555 km of diversion furrows and 2,254 km of meadow strips. These actions, undertaken as cheaply as possible and imposed on the local people against their will increased erosion by forcing water into channels creating subsoil “piping” which then collapsed and formed dongas that crisscross agricultural lowlands (McCann, 1999).

In comparison, on the white-owned lands of the Free State, when *dongas* appeared on newly opened South African soils, government paid half the cost for farmers to take mitigative measures, building dam walls on the *donga* face that served as livestock tanks, or the construction of retaining walls so they would fill-in quickly. The few *dongas* visible in the eastern Free State today are stable or reclaimed (McCann, 1999).

⁵⁹ Gullies

The situation has not improved in recent times.

“A UN team assessing agriculture in Lesotho in 2002 noted that agriculture faces a catastrophic future; crop production is declining and could cease altogether over large tracts of the country if steps are not taken to reverse soil erosion, degradation, and the decline in soil fertility. Nearly half of the children under five in Lesotho are stunted physically. Many are too weak to walk to school” (Brown, 2003a).

Turner (2004 *In: Fabricius, Kock, Magome & Turner, 2004*) explains that Lesotho, with a human population that has doubled since 1966, is 17% overstocked with livestock. The government has discouraged the movement of livestock to summer grazing grounds in the now highly populated highlands. The government and USAID funded attempts from the 1970-1990s at improved range management through the creation of Range Management Areas (RMAs) of 10,000 – 35,000 ha and community Grazing Associations (GA’s). They have had limited success, not exceeding 10% of the national rangelands. However, other factors are coming into play that will likely reduce livestock numbers including the following: 1) increase in stock theft and open access ranges. Many feel this is because of reduction in power of traditional authorities, the chiefs, while favoring weak village institutions created and supported by the government/donors, 2) livestock is only owned by the better-off rural households, while very poor households rely on wild resources to survive such as firewood, and wild vegetables from the grazing areas, 3) with free primary education, former herd-aged boys are going to school, which is resulting in a major labor constraint, and 4) a shift towards tourism has taken place as a way of generating wealth in these rural areas, though this latter change appears to be donor driven through UNDP/GEF’s Conserving Mountainous Biodiversity in Lesotho, and the Maloti-

Drakensberg Transfrontier Conservation Area (TFCA) Project. This has resulted in a smaller number of livestock being owned by a minority of the rural population, thereby significantly reducing grazing pressure. The Basotho people reject both “open access” and “privately owned fenced ranges” in favor of common property managed community-based range management systems (Turner, 2004 *In: Fabricius, et al.*, 2004).

5.6.1.7 Impacts of colonialism on traditional agriculture in South Africa

The Glen Grey Act of 1894 limited black farmers to 10 acres (4.2 ha) each. In 1910, one key goal of the South African government was to ensure adequate supplies of cheap labor to the mines. Despite previous efforts to restrict African farming to either reserves or manorial estates and to subsidize white farmers, black farmers continued to maintain a competitive edge in the market place. The chronic labor shortages on white farms were intensified by the emergence of the mining and manufacturing industries with their massive labor demands. The Natives Land Act, under British rule, was passed in 1913 (IFAD, 2002; Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*) and 1936 (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*), compressing the African population (80% of the total population) onto 13% of the country’s land in native reserves, which could not support them economically. Others estimate that 70% of the population was crowded onto 8.5% of some of the country’s worst land (Rosenblum & Williamson, 1990). Huntley, Siegfried and Sunter (1989) estimate that by the late 1980s, 42% of the population (14 million out of a population of 33 million) was on 13% of the land, implying that there has been a massive urban migration, as planned, to serve the mines and industry. The 1936 Natives Trust and Land Act and the Group Areas Act of 1950 continued to impact urban and land rights for non-white South Africans (Bernstein, 2005).

Most of the forced removal took place between 1958 and 1988, displacing 3.5 million blacks into unsuitable areas, a product of the alliance between “gold and maize” (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*).

Huntley *et al.* (1989) estimate that of South Africa’s territory of 122 million ha, just under 101 million ha were farmland (agriculture, livestock, game ranches) in 1989, of which 16.6 million ha (16.4% of the farmland) were arable. Bernstein (2005) provides the figure of 100 million ha of commercial land, meaning owned by whites. Of the arable land, 3% has high potential, while 10.5% has medium to low potential. About 65% of the land is non-arable with under 500 mm of rainfall/year and 21.5% is non-arable with rainfall above 500 mm/year. This non-arable land is suitable for livestock and game ranching (Huntley *et al.*, 1989). Bernstein (2005) states that 13.7% of the total land area as potentially arable.

The inequity in the distribution of arable land is similar to that of Zimbabwe. In 1989, about 50,000 white South Africans had 70% of the farmland at 85.4 million ha (1,700 ha/farmer) of which 14.3 million ha (286 ha/farmer) was arable. About 25% of these white commercial farmers accounted for 75% of South Africa’s agricultural output/production (Huntley, *et al.*, 1989). It is estimated that there are 91,000 black commercial farmers in South Africa but with much smaller land holdings (Bernstein, 2005).

In the crowded homelands 700,000 farmers had 13% of the farmland or 15.1 million ha (22 ha/farmer) of which only 2.3 million ha (3.3 ha/farmer) was arable. In addition, this was along with an inadequate distribution of industry to absorb this ever-growing population. These homelands produced 6% of South Africa’s agricultural output/production (Huntley, *et al.*, 1989). Similarly, Bernstein (2005)

provides the figure of 3 million ha of high quality agricultural land owned by black South Africans.

The overall percentages for land utilization in South Africa are 68% grazing, 14% arable, 10% nature conservation, 1% forestry and 7% other (Department of Agriculture, 2001 *In:* Bernstein, 2005). While white commercial farms provide 90% of the market produce, most farms are not part of this production. More and more, especially in the drier areas, they are opting for game ranching and ecotourism (Bernstein, 2005).

The figure of 0.16 ha of arable land/person (of the total homeland population) in 1989 was projected to decrease to 0.1 ha of arable land/person in the homelands by 2000 compared to 0.51 ha of arable land/person expected to drop to 0.36 of arable land/person in the whole of South Africa against a global norm of 0.4 ha of arable land/person (Huntley, *et al.*, 1989)⁶⁰. One does not have to look too far to understand why the homelands cannot feed themselves, meeting only 16% of their needs, and why much of the land is degraded since it should never have been farmed in the first place (Huntley, *et al.*, 1989). The National Department of Agriculture (2003) estimates that:

- 50,000 medium to large commercial farmers manage 61,000 commercial farms on 82 million ha;
- 240,000 small commercial farmers provide local and regional markets, principally to informal traders;
- 1 - 3 million rural householders produce food primarily to meet their family's needs; and
- 14.5 million ha of farmland was available in the former homeland areas.

⁶⁰ See Section 5.9.1, Over-population, Land Scarcity and Decreasing Agricultural Production in Sub-Saharan Africa, Table 5.16 shows 0.27 ha/person in Africa and 0.26 ha/person globally of crop land.

Impacts of Colonialism on Traditional Agriculture and Livestock in the Old Transvaal, South Africa

The Transvaal's post-Anglo-Boer War reconstruction was based on imperial ideas of progressive agriculture, estate management, and racial supremacy. Most important was the belief in the superiority of whites over Africans and from this followed the conviction that the Transvaal must become "white man's country". This is why in 1902, the British did not entrust the local administration to chieftaincies or encourage African peasants to produce cash crops and livestock for the local mine-dominated market. This would not have been acceptable in a settler economy, as it would have meant competition from Africans. In addition, it might have disrupted the flow of cheap labor to the mines. Veterinary resources, surveying, fences and beacons supported European land settlement schemes as the land was parceled and divided in creating a European landscape. A new beef frontier was established to supply cheap meat to urban mine-dominated markets. The settlement projects were also part of a broader policy of encouraging Africans to take up wage labor, the state taking great measures to marginalize rural African societies through land dispossession and restrictions on peasant production, including taking protectionist measures against a competing pre-colonial tradition of cattle husbandry and trade (Milton, 1997 *In:* Griffiths & Robin, 1997).

5.6.1.8 Impacts of colonialism on traditional agriculture in Uganda

In Tanzania and Uganda, the colonial regimes actively promoted production by African farmers, rather than large-scale farming by Europeans (IFAD, 2002), though it was not always the small-scale farmers who benefited.

As part of the “Ugandan Agreement” of 1900, the Ugandan colonial power, Britain, gave the Buganda and Bunyoro elites control of 25,900 km² (10,000 square miles) (12% of the protectorate) in one-mile-square *milos* (*mailo*). These elites enriched themselves by developing private estates on which they used peasant labor to produce crops exported by the British (IFAD, 2002).

Mair (1977) and Chrétien (2003) discuss this as mainly occurring in Buganda. Barrow, Gichohi and Infield. (2000) speak of this agreement affecting the Buganda, Toro and Ankole districts. The colonial power, not traditional rulers, developed a feudal-like system, in which the mass of peasants were reduced to tenant farmers (*bakopi*) who were stripped of their former lineage rights. In addition, private property became a monopoly of the oligarchy, a new class of African landlords who were rewarded for their collaboration with their colonial powers and associated missionaries (Mair, 1977; Chrétien, 2003).

“Though the land was supposed to have been granted on free, uncultivated land, this was often not the case and thus formerly ‘free’ peasant farmers were suddenly converted into tenant farmers required to pay rent to landlords (Doornbos, 1978 *In:* Barrow, *et al.*, 2000). This imposition of a foreign land tenure system onto a traditional one caused considerable social dislocation, the effects of which continue to be felt today” (Barrow, *et al.*, 2000).

According to Mair (1977) there were 1,000 chiefs – royal clients or their clients were given freehold private ownership of land; the majority holding no administrative position as “chief”. According to Chrétien (2003), the “thousand” was discovered to be 4,000 by 1921, including *bakungu* chiefs,⁶¹ *batongole* chiefs⁶² and a number of clan chiefs (*bataka*)⁶³. The control of land was

⁶¹ Traditional political and often military leaders at a sub-regional level with direct communication to the king or *Omugabe*, and minor chiefs in the Ankole (Nkole) Kingdom (Mwambutsya, 1991)

⁶² Bugandan chiefs today at sub-parish level – lowest level below in order of importance: 1) *Ssaza* (county) chiefs, 2) *Ggomboloa* (sub-county) chiefs, 3) *Miluka* (parish) chiefs and 4) *batongole* (sub-parish) chiefs (The Monitor, 2004).

independent of any political responsibility. In Busoga and Bunyoro, Uganda Protectorate officials realized that this system was unfair to the mass of the population who had to pay rent for land and were thus refused freehold grants. In Bunyoro, they issued “certificates of occupancy” to anyone guaranteeing continued occupancy as long as the land was cultivated. Demanding rent, however, was made illegal. However, both the Nyoro and Ganda believe that a chief is a man to whom others are attached. In essence, the same thing happened. Every man who obtained a civil service job as a “chief” obtained a grant of inhabited land and a certificate of occupancy from the ruler. This created “landlord-chiefs”. Busoga was left alone during the colonial period, with traditional village headmen allotting newcomers land, but now land cost, first paid for in kind with bark cloth and eventually with money that was given as a “gift” as was customary when someone approached a superior (Mair, 1977).

Attempts to resist the takeover of Buganda and Bunyoro by the British resulted in King Mwanga of Buganda, who had been put back into power by the British, and King Kabarega of Bunyoro being deported to the Seychelles in 1899 where they died in exile. Meanwhile, a “child king”, Daudi Chwa, and his “salaried” advisors were placed into power under the auspices of “indirect rule” where they served as proxies for the British colonial government (Chrétien, 2003). This marked the end of traditional land management systems in Uganda.

On the other hand, in Kigezi, southwestern Uganda, where there was a history of terracing, fallow agriculture, mixed cropping with nitrogen fixing legumes (peas and beans) (see Chapter 2), colonial attempts at soil conservation were integrated into these traditional systems. By the time changes were tried and modified, the colonial-introduced system was very close to the original indigenous system. Where there was success, it was because that which was introduced was similar to

⁶³ Bugandan elders (Mwanje, 2004)

the existing indigenous system. Education and propaganda, such as competitions for the best plots and yields was employed over force and traditional chiefs. In the 21st century, farmers continue to maintain fallow periods, but with a likelihood of increased differentiation in the ownership of land and livestock and increased landlessness, out-migration and residents living off remittances (Carswell, 1997 *In:* Adams & Infield, 1998; Carswell, 2003 *In:* Beinart & McGregor, 2003).

With considerable support from USAID and the World Bank, the new 1998 Ugandan land act assumes that (Barrow, *et al.*, 2000):

- “Customary tenure does not provide a basis for commoditization on the grounds that customary rights do not represent private, or tradable property; and
- Smallholding is a less desirable target for investment than commercial farming, and that opportunities to aggregate holdings must be available”.

This transforms landholding into “European” forms of ownership, weakening traditional rights, and in particular communal rights, supporting the interests of investors over the smallholder with minimal constraints upon land accumulation (Wily, 1997 *In:* Barrow, *et al.*, 2000). Meddling in traditional land use systems by both colonialism and Western donors has been the cause for much conflict around Lake Mburo, Uganda (see Chapter 11, Section 11.11.2, Donor Driven Conservation, Lake Mburo National Park (LMNP), Uganda). Much of the most potentially valuable areas for wildlife use are currently on communal land, such as in Karamoja. It is not clear whether the new legislation allows for communal land ownership (Barrow, *et al.*, 2000).

“Formerly communal land belonged to the state, and was under the control of the districts. The Local Government Statute also gives responsibility to district authorities for the management of natural resources. The implications of this are unclear. On the one hand it paves the way for more land to be expropriated, and on the other it enables districts to plan for the development of wildlife industries by controlling land use and working with Uganda Wildlife Authority (UWA) on the issuing of use rights” (Barrow, *et al.*, 2000).

5.6.1.9 Failure of colonial groundnut scheme in Tanzania (Tanganyika)

In 1946, “hundreds of miles of jungle were cleared by science and the bulldozer with a real promise of a better life for Africans and Europeans” (MacKenzie, 1997 *In: Griffiths & Robin, 1997*). The British Government, under the auspices of the United African Company, launched a program to transform 12,150 km² into groundnut cultivation for the production of margarine and oil destined for British consumers. No environmental (e.g., adequacy of rainfall, groundwater, socio-economic considerations) or soil assessment was undertaken. On most of the selected sites, though productive, the soils dried out and became too hard when exposed to the sun. In addition, there was massive gully erosion in the tracks left by tractors. Soils suitable for cropping were often limited in distribution and widely dispersed. Bush clearing was undertaken in blocks of 2.59 km², which was unsuitable for annual cropping. Since this failure, the production of groundnuts by large-scale mechanization has never been revived in East Africa (de Vos, 1975).

5.6.1.10 Impacts of colonization on soil fertility, Bukoba, Tanzania

This area, lying along the coastline on western Lake Victoria from Musira Island to Bukoba Bay, depended upon mixed animal husbandry and crop farming. The soil in the area was poor tending towards laterization, with pockets of fertile land

(20% of the land) coinciding with settled areas (Milne, 1938 *In: Kjekshus, 1977*). Rinderpest of the late 1890s had a major impact on soil fertility from a loss of manure. Grasses from the swamps and marshes were deposited over the agricultural plots to prevent laterization. Laterization transformed the soil mantle of grasslands uncovered for cultivation into oxides of iron and aluminum (Schmidt, 1974 *In: Kjekshus, 1977*) making them infertile. Not understanding the soil chemistry of the area, both German attempts in the late 1800s (Stuhlmann, 1894 *In: Kjekshus, 1977*) and British attempts in the 1930s (Schmidt, 1974 *In: Kjekshus, 1977*) failed at cultivating these grasslands.

5.6.2 Land Degradation Linked to Independence

The “English School” tends to blame post-independent Africa governments for much of Africa’s agricultural ills. Morris (1995) argues that many of the traditional systems survived colonialism and could have been developed, but that oppressive regimes emerging out of independence undermined indigenous institutions that enabled peasants and nomads to adapt to changing circumstances in much of Africa’s harsh and fluctuating savanna environments. Indigenous political systems were replaced by dictatorships and marketing systems by centralized government-marketing boards, which served as middlemen, underpaying the peasant producers and maximizing government profits on the international markets. The entrepreneurial middleman was eliminated, and thus the opportunity for the producer to negotiate prices according to supply (Morris, 1995). Morris (1995) does make some pertinent points concerning land degradation, admittedly implicating foreign aid in the actions of “African despots”, namely waste, corruption and the breakdown of indigenous institutions. This includes (to be discussed in more detail in later chapters):

- 1. Restrictions on the Private Ownership of Land and Natural Resources.** Land and natural resources on the land tend to be “owned” by the state, reducing the individual peasant's incentive and ability to invest in land and natural resources. This results in a “tragedy of the commons”, with land like wildlife habitat becoming an “Open Access Resource” and where reinvestment in soil conservation is less than if the land were managed by a single local communal authority. What Morris (1995) calls “political entrepreneurs” have caused land degradation by distorting the incentives faced by peasants and others. They often use the land for themselves or their political constituency and encourage overuse of land by generating uncertainty over property rights through forced migration, slaughter of cattle, denial of customary tenure, the under-pricing of agricultural output, and the subsidization inappropriate agricultural inputs (fertilizer, machinery, irrigation),⁶⁴ which can lead to wastage.
- 2. State-Subsidized Boreholes.** Peasants and nomads flock to these boreholes to take advantage of the “free” (un-owned and un-priced) water and land, becoming sedentary and degrading the environment (see Chapter 6). Examples include Botswana and across the Sahel.
- 3. State-Subsidized Dams.** Encouraged and financed by “aid” agencies, especially the World Bank, dams have destroyed traditional ecological production systems and millions of lives, especially those linked to downstream floodplains (see Chapter 7, Table 7.16: Major dams in Africa that have affected local communities). Examples include the Cahora Bassa and Kariba Dams on the Zambezi River and the Manantali and Diama Dams on the Senegal River.
- 4. State Subsidies to Irrigation and Mechanized Farming.** Linked to dams, inefficient state parastatal irrigation schemes have often been disastrous to the local ecology, traditional production systems and rural

⁶⁴ The authors would argue that some subsidies to farmers, as in the USA and EU might be appropriate.

residents (see Chapter 7). Examples include SAED (*Société d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal*) and the Niger Office in the Inner Delta of Niger.

5. **Compulsory Resettlement Programs** from land to be flooded by state-subsidized dams, or simply at the whim of a dictator, have resulted in the disruption of social structures and traditional land/resource tenure. The new lands are often less productive (see Chapter 7, Table 7.16 - Major dams in Africa that have affected local communities).
6. **Compulsory Limits on Livestock Ownership** without looking at customary law, the role of cattle as a drought food, and the ability of cattle to eat a more diverse array of grasses than humans (e.g., humans can eat *fonio*, *Digitaria exilis*) have also had negative effects.
7. **The Knowledge Problem.** A more general problem with state intervention is its intrinsic inability to meet the needs of the people. Only an individual knows his/her own needs and wants and these are best satisfied through mutually advantageous exchanges in the market. People's needs and wants are no longer met as effectively. Intervention failure leads to a vicious circle of land degradation, aid, and oppression.

Morris (1995) and Chabal and Daloz (1999) place much of the blame on foreign aid bureaucrats and governments who spread the myth that local people do not understand the environment in which they live, and that they intentionally misuse the soils, let their livestock over-graze and have too many children. They also argue, that self-seeking autocrats undermine traditional management systems and control in favor of obtaining aid money to help overcome “starvation and desertification”, while actually misusing the money for their own purposes (see Chapter 11, Foreign Aid).

The following exemplifies the collusion between political elites of African governments and foreign aid bureaucrats. When the principal author arrived in Senegal in 1982, his counterpart,⁶⁵ now an environmentalist with the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) drove him around the town and asked, “What is most striking to you”? The most striking observation in Dakar, the capital, was the large proportion of Mercedes Benzes given the level of poverty in the country. It was explained to the principal author by his counterpart, that the majority were purchased with misappropriated Western donor money, and in fact, there were ministers who stated openly that the last thing they wanted was for Senegal to develop, as this would mean less income for them, since their government salaries were too small to support their lifestyles. In the midst of the Cold War, donors buried their heads in the sand, with little or no attempt at recovering stolen “development” funds. The elites from both groups were not about to criticize a system that gave them privileged lifestyles and nice incomes.

However, this “English School” (Bull, 1977; Bull & Watson, 1984 both *In:* Dixon, 2002) neglects the role that the international capitalist economy has played in marginalizing Africa from the global mode of production, and has tended to overlook the extent to which it has served to induce frailty and instability in virtually all African states (Inayatullah & Blaney, 1995 *In:* Dixon, 2002) (see Chapter 13 on the International Private Sector in Africa). By locating the responsibility of African frailty with a few despotic rulers or fanatical groups, an accusation that is admittedly significant, the English School literature effectively exonerates International Finance Institutions (IFIs)⁶⁶ (– see Chapter 12 on Structural Adjustment), the structures of the global capitalist economy and the legacy of colonial rule from the continued economic paralysis afflicting African

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⁶⁶ IFIs include the World Bank, African Development Bank/*Banque Africaine de Developpement* (ADB/BAD), Inter-American Development Bank, Asian Development Bank and the European Bank for Reconstruction and Development.

states (Dixon, 2002). Benneh, Morgan and Uitto (1996) explain that the collusion between the African political elite (often well-placed politicians) and businessmen or agents (e.g., oil, timber, mining and agro-industries) of the former colonial powers is often overlooked to the benefit of both parties but to the detriment of the common people of Africa. This is discussed in greater detail in later chapters. Additionally, many of the policies, such as state ownership of land and natural resources, have been inherited from those established during colonial times and thus cannot be blamed entirely on African governments.

5.6.2.1 Marketing boards and cocoa, 2004 in the Ivory Coast

This process continues in the 21st century. In mid-2004, Ivory Coast cocoa unions were threatening to shut down the main city, Abidjan, if their demands for compensation money and reform were not met. Trade liberalization has been less than successful.

“About 6 million people rely directly or indirectly on cocoa revenues in Ivory Coast, which accounts for about 40% of world cocoa exports...Ivory Coast remains the world's leading cocoa producer, but civil war, falling prices and the semi-privatization of the sector have cut down earnings for growers of the fragrant bean...Liberalization of the sector since President Laurent Gbagbo took power in disputed elections in 2000 has been what he calls ‘savage’. Semi-private agencies, with financial independence but politically appointed leaders, have replaced state agencies to regulate the sector. A system whereby growers were ensured a minimum yearly price for their cocoa from buyers and exporters has been abandoned...Instead, planters have been paying a fluctuating charge on each kilogram of cocoa sold to a cooperative-type body called the Regulation Fund for Coffee and Cocoa. It has been about two cents this year, but more in previous years when cocoa prices were higher” (Colombant, 2004a).

Instead of compensating farmers when prices on the ground fall this body has been investing in projects that unions never approved. Some say the planters are

being robbed and are collectively owed about US\$ 80 million. In 2004, growers were getting as little as US\$ 0.40/kg of cocoa sold to buyers and exporters, compared to more than US\$ 1/kg the year before. The union was also threatening to start a third port in the Ivory Coast, apart from Abidjan and San Pedro, so they could control the lucrative sector themselves (Colombant, 2004a). Similar impacts from privatization of the marketing board for cocoa in Cameroon are discussed in Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People And The *Dobi Dobi*, More Parks And Protected Areas.

5.6.3 Foreign Aid and Impacts on Agricultural Production and Land Degradation

Foreign aid has had a devastating impact on agricultural production in Africa from promoting agriculture on marginal lands that may have more appropriate land uses, to dumping subsidized food from the West that is a disincentive to production by local farmers. This is discussed in greater detail in Chapters 11 and 12.

5.6.3.1 Agricultural bias by donors as solution a to Africa's backwardness – constraint to appropriate land use

Until the late 1980s, Western donors, mainly driven by agricultural economists, held that Africa's backwardness could be overcome by agricultural initiatives: improved crop production, tree farming, livestock and fish culture, and on-farm systems known as "integrated rural development", a policy that has failed (Eicher, 1990 *In: Eicher & Staatz, 1990*). There was little attempt to manage natural systems or to recognize that the majority of the poorest of the poor lived in marginal, over-populated and already degraded agricultural areas, some of which might have other preferred land uses such as tourism. This began to change in the

1990s with more attempts at managing natural systems and recognizing their potential for income generation as part of “food security” initiatives where one could buy food as opposed to “food self-sufficiency” policies of the 1970s/80s which held that each African and each African country should be able to produce all of its own food. Eicher (1990 *In: Eicher & Staatz, 1990*) was concerned that in a “blind determination to help Africa”, especially after the 1984/85 famine, there was a danger that donors would not critically examine the food and livestock failures in the Sahel over the previous 15 years of US\$ 15 billion in donor assistance and incorporate lessons learned into the design of natural resources projects in the 1990s.

5.6.3.2 Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture

The Sahel provides a good case study of just what is wrong with much Western aid. The Sahel Development Program is a massive scheme supported by billions of dollars from the UN Food and Agricultural Organization (FAO), France, Holland, Belgium and the U.S. to “rid the Sahel of food shortages and ecological deterioration, to overcome dependency and to raise the incomes and quality of life for 26 million people”. The project has created a series of large-scale food production schemes over eight countries producing everything from rice (for urban areas) to beef cattle (for export). Only 16% of the billions of dollars of aid went to rainfed crops that poor peasants and nomads of the Sahel depend upon to survive. Most of the farming schemes involved large - scale irrigation and mechanized agriculture that excluded peasants (but benefited political elites and their constituency). Little attention was paid to increasing badly needed storage facilities or to ensuring a fair distribution of the new food grown (Elwood, 1984). Many of these large scale irrigation schemes have failed, while wiping out traditional production systems and making rural people poorer and worse off

nutritionally, while to some degree benefiting political elites of the host countries, aid bureaucrats, construction companies and consulting firms (see Chapter 7, Section 7.9.3.1, Senegal River and Section 7.9.5.1, Senegal River).

Irrigation along the Senegal River

At a cost of \$25,000-40,000/ha, instead of 375,000 ha in pumped irrigation, only about 100,000 ha have been brought under irrigation with only about 2,000 ha/year being added (Bosshard, 1999). With the average production of rice not exceeding three tons/ha/year (instead of the projected 12 tons/ha/year), pumped irrigation is economically questionable. As the Senegal River Delta was a marine bay that gradually filled in with sediment over the last few thousand years (Monteillet, 1988 *In:* Hamerlynck, Duvail & Ould Baba, 2000), there is an underlying hypersaline groundwater sheet at about 1 meter below average sea level (ASL) stretching to over 200 km inland. Current irrigation practices, usually without drainage systems, seem unsustainable because of increased soil salinity and large tracts have already become permanently unsuitable for agriculture (Hamerlynck, *et al.*, 2000). With irrigation, the traditional sorghum crop was replaced by rice. These problems were foreseen by the agronomist on the environmental assessment team, and were not hidden; projections were made, however, that irrigated crops would replace those lost from traditional systems. It is estimated that the lives of between 500,000 – 800,000 people were forever changed in a negative way from the loss of traditional food production systems (estuarine and freshwater fishing, recession agriculture, and dry season forage) on the floodplains and estuary for a technically, ecologically and economically unviable program (see Chapter 7, Section 7.9.5.1, Senegal River, Section 7.9.6.1, Senegal River and Chapter 12, Section 12.4.4.1, Impacts of structural adjustment on peasant farmers along the Senegal River for detailed discussions on development impacts on traditional agro-pastoral systems in the Senegal River

Basin). It was cheaper to import rice from Asia. Meanwhile, rice was subsidized in an attempt to make it artificially competitive. Rice is produced at a relatively high cost in irrigated areas of the Senegal River Valley and Upper Casamance, while producer prices were subsidized through 1994 (Kelly, Diagana, Reardon, Gaye & Crawford, 1996; Reardon, Barrett, Kelly & Savadogo, 1999), but at what expense in the long-term to the Senegal River Valley being able to feed itself based upon over 1,000 years of traditional floodplain irrigation (see CHAPTER 7: IMPACTS OF DAMS ON CONSERVATION AND DEVELOPMENT IN AFRICA)?

The Casamance, Senegal Traditional Rice Culture, Versus Modern Interventions

The Casamance is dominated by a mangrove estuary, with hypersaline waters at times exceeding 170 ppt - parts per thousand (Sea water is 35 ppt). It is situated in southern Senegal and sandwiched between the Gambia and Guinea-Bissau. It is dominated by the Jola (Diola) tribe that has practiced swamp rice culture in a harsh environment for centuries growing African rice (*Oryza glaberrima*). Swamp rice culture takes place in advanced mangrove soils by diking off a section of the land to be cultivated. The soil is allowed to be covered daily by tidal action. As the rains come, the area is gradually closed off from tidal inundation, and drained at low tide until the salinity of the soil and water is low enough to allow rice to grow. The soils are never allowed to dry out.

Dutch aid workers seeing this “primitive system of rice culture” were determined to improve upon the traditional Jola (Diola) practices by permanently diking off a large area of mangrove soils, which dried them out. These pyretic soils when dried out oxidized to form sulfuric acid. This resulted in acidic soils, low pHs and

heavy metal toxicity, turning productive soils, into sterile soils, where until today nothing will grow. For further discussion on the impacts of foreign aid interventions in the Casamance see Chapter 11, Section 11.7.9.2, Barrage De Affiniam, Casamance, Senegal; foreign aid big money, ecological destruction.

Cold War Politics and Western Donor Impacts on Food Production, Senegal

The principal author lived and worked in Senegal on and off from 1976 to 1988. As the furthest point west in West Africa, Senegal was strategically very important for the West during the Cold War. This included serving as a potential staging ground for interventions on the subcontinent (Senegal being renowned for its soldiers), serving as an emergency landing for the U.S. Space Shuttle, and serving as a no-go zone for Russians, who were only allowed to periodically send in an Aeroflot plane to change fishermen, as allied submarines are said to have plied deep canyons off the West Coast of Africa.

During the Cold War, the U.S. and France allegedly dumped money directly into the government coffers to pay the salaries of functionaries and maintain an artificial economy (see Chapter 11, Section 11.6.7, Foreign Aid and Puppet Governments – Donor Democracy). It is reputed that France paid approximately three times the World Market price for peanut oil. According to Badiane (2001):

“the Lomé Convention, originally established at the 1963 Yaoundé Convention between 6 European countries (Belgium, France, Federal Republic of Germany, Italy and the Netherlands) and their 18 former colonies of the Association of African States and Madagascar, enforced preferential trade agreements, notably access for raw materials to Europe, as well as financial and technical assistance to be financed by the European Development Fund (EDF). It allows duty free access to agricultural and industrial exports from selected developing economies”.

As a result, “France was committed, at least up to 1967, to buying Senegalese peanut exports at premium levels over prevailing world prices” (Boyle, 2000). Price support for peanuts to Senegal under the Lomé Convention ended by 1968 with France’s entry into the European Economic Community (EEC), now known as the European Union (EU) (Badiane, 2001) in fulfillment of the Treaty of Rome (Boyle, 2000). The EU took over from the French. To some extent, the EEC’s newly established European Development Fund (EDF) helped offset the loss of French subsidies (Boyle, 2000) . In turn, this “foreign aid” permitted government support to peanut farmers to continue. The impacts on peanut production and soil quality, when virtually all support, direct and indirect, to peanut farmers ended as a result of structural adjustment in the early 1980s, and the impact this had on soil quality is discussed in Chapter 12, Section 12.4.3.2, Impacts of structural adjustment on fertilizer use and intensification in Senegal’s Groundnut Basin. To some degree, the EU continues support to peanut farming. In the 21st century, as a result of the “Lomé Convention and preferential trade agreements between the European Union and the African, Caribbean and Pacific (ACP) Group of 44 countries, Non-ACP exporters of groundnuts face tariffs of 5 to 15% when entering the EEC market, thus giving a slight edge to Senegalese groundnuts” (Badiane, 2001). Small-scale farmers produced peanuts in Senegal, a policy that had continued since colonial times (see Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel).

Back in the 1970s and 1980s, peanut oil sent to France is reputed to have been refined a second time to remove carcinogenic aflatoxins that accumulated during storage from factors such as excess moisture and temperature (e.g., when temperature is within the range of 25-32°C and relative humidity is greater than 84%) (Soufi, 2001), while the harvested peanuts awaited transport to the refineries (see Figure 5.5: Mountains of peanuts in Senegal’s Groundnut Basin).

The French began a campaign to eliminate aflatoxin in peanut oil in the late 1980s (Bernier, 2005).

Prior to the HIV/AIDS pandemic, hepatic carcinoma (liver cancer), resulting from aflatoxin consumption of improperly stored grains and grain products (including peanuts and maize), was probably second only to malaria as a significant public health hazard in Sub-Saharan Africa (Peterson, *pers. comm.*). According to Miller (1996 *In:* Bankole & Adebanjo, 2003), 40% of the productivity lost to diseases in developing countries, including Sub-Saharan African, is due to diseases exacerbated by aflatoxins, with aflatoxin contaminated diets being linked to liver cancer. Aflatoxins are some of the strongest natural carcinogens produced by a mold (*Aspergillus spp.*) and are classified as “Class 1” human carcinogens (IARC, 1993 *In:* Bankole & Adebanjo, 2003). Recent EU policy changes on aflatoxin in 1997 (Badiane, 2001) could result in the reduction by 64% in imports of cereals, dried fruits, and nuts from nine African countries: Chad, Egypt, the Gambia, Mali, Nigeria, Senegal, South Africa, Sudan and Zimbabwe, resulting in an annual loss of from US\$ 670 million (Bankole & Adebanjo, 2003) to US\$ 400 million for African producers (Badiane, 2001). In a study carried out in the Gambia, Guinea-Conakry, Nigeria and Senegal, over 98% of subjects tested positive to aflatoxin markers (Wild, 1996 *In:* Bankole & Adebanjo, 2003).

Peanut oil extracted from poor-graded peanut seeds always contains very high levels of aflatoxins (Suttajit, 2005) and the oil-soluble toxin has to be eliminated by absorption (Ozdemir & Ozilgin, 1995; Suttajit, 2005) and alkalinization (Duke, 1983; Suttajit, 2005) during the oil refining process. Today, commercial peanut oil refineries in Senegal, whose oil is destined largely to an overseas market, use various techniques to eliminate aflatoxins (Badiane, 2001). However, Ndiaye, Diop, Diouf, Fall, Thiaw, Thiam, Barry, Ciss and Ba (1999) found high levels of

aflatoxins in small-scale pressed peanut oil, which would likely be used mostly for local consumption.

Additionally, people living in Senegal were forced to pay about 2.5 times the world market price for uneconomical irrigated sugar cane from a French-owned plantation, *Compagnie Sucriere Senegalaise* (CSS), in Richard Toll on the Senegal River Delta. Established in 1970, CSS

“was given 7,300 ha of land by the Government under highly favorable conditions, including 30,000 m³ of water/ha free of charge each year and monopoly of the market for sugar in Senegal. In spite of these advantages, CSS has already cost the Government vast sums, estimated at 14,600 million CFA⁶⁷ Francs (US\$ 584 million) in 1992, and the cost of a kilo of sugar in Senegal is much higher than the international market price” (Adams, 2000).

Maize introduced for livestock fodder by American agronomists in Senegal and the Gambia saw local people change their dietary habits, preferring corn to more-nutritious millet and sorghum (Table 5.10).

Table 5.10: Nutritional value of traditional grains and corn

Grain Crop	Grams Protein per 100 gram portion	Grams Carbohydrate per 100 gram portion
Maize Meal/Grits/Pap	8.80	79.60
Sorghum, <i>Sorghum bicolor</i>	11.30	74.63
Raw Millet, <i>Panicum miliaceum L.</i>	11.02	72.85

Source: USDA (2004) National Nutrient Database for Standard Reference, www.nal.usda.gov/fnic/cgi-bin/list_nut.pl, with permission U.S. Department of Agriculture (USDA) + public domain.

⁶⁷ Communauté Financière Africaine franc, originally at a fixed rate against the French Franc, since January 1, 1999 fixed against the Euro

Sorghum and millet are also much more drought tolerant than corn, while protein deficiency is currently a major problem in rural Senegal/West Africa. By the time the principal author left West Africa in 1989, fallow periods were greatly reduced or disappearing due to the ever-increasing human population.

5.6.3.3 Donor subsidized food as a constraint to agricultural production

Dumping of cheap subsidized food by the West in the name of food aid is also a disincentive to Africa feeding itself, often undercutting local food production. This also decreases the multiplier effect of money circulating within a country and stymies the development of agro-industries to transform locally produced products (Smith, 2001). Agricultural subsidies, giving Western farmers an artificial comparative advantage over unsubsidized developing world farmers, have been a major reason for the collapse of the September 2003 World Trade Organization (WTO) Summit. This is discussed in more detail in later Chapter 11, Section 11.8, FOOD AID and in Chapter 12 on structural adjustment and subsidies.

5.6.4 Structural Adjustment, Fertilizer Use, Food Production and Land Degradation in Sub-Saharan Africa

See Chapter 12, Section 12.4, STRUCTURAL ADJUSTMENT FOOD PRODUCTION AND LAND DEGRADATION IN SUB-SAHARAN AFRICA.

5.7 POLICY REFORM CONSTRAINTS TO AGRICULTURAL PRODUCTION

Although agriculture is increasingly recognized as the engine of economic growth in Sub-Saharan Africa, the level of government commitment to it is low.

Governments often penalize agriculture through a variety of mechanisms, including export and import taxes, foreign exchange controls, export licensing requirements and controls, and bureaucratic marketing boards. Food subsidies (i.e., food retail prices kept artificially low) have allowed governments to keep food prices low to appease urban constituents, but at the expense of rural producers. Such policies and practices have reduced farmers' incentives to increase local food grain production and to use modern inputs to improve productivity (Gruhn, *et al.*, 2000; Mule, 2003). Meanwhile, in the industrial countries agriculture enjoys an annual subsidy of \$US 300 billion - equivalent to Africa's total GDP (Mule, 2003) (see Chapter 12, Section 12.2, SUBSIDIES AND FREE-TRADE).

5.7.1 Property Rights and Land Tenure, Constraints to Soil Fertility and Agricultural Production

Insecure and crumbling tenure arrangements also contribute to declining soil fertility and thus agricultural production (see Section 5.5.2.2, Nutrient depletion as a constraint to agricultural production). The issuance of title deeds on its own may not be adequate if not complemented by other factors, such as improved infrastructure in rural areas – roads, education, health, markets, energy, etc. (UNECA, 2003). It is essential that they be accompanied by comprehensive programs of agrarian reform, including access to credit, savings and markets in rural areas if they are to fundamentally redress the inefficiencies of inequality (Roman, 2003). Mule (2003) argues that

“in Africa, the vast majority of farmers still hold their land under indigenous, customary land tenure systems. Several studies have shown that there is no marked difference in agricultural productivity between customary and individual land tenure systems. Community level institutions can therefore be used as important vehicles for agricultural development and poverty eradication”.

Likewise,

“in view of the precarious environment, farmers and pastoralists alike are served better by flexible land-tenure regimes that permit moving in order to make optimal use of available resources and production conditions. Livelihood security is attained through kinship relations that confer access rights in geographically dispersed pools of territories. In an unpredictable and precarious environment, geographic mobility is essential for actors to secure their livelihoods, both in the long and the short-term. Actors’ movements, as they appear from their land-use paths, not only are made possible by the prevailing land tenure regimes but also continuously promote its flexibility and the merging and shifting of rights to land. This argues against the establishment of western-type tenure security and in favor of the maintenance of flexible resource tenure regimes” (Breusers, 2001 *In: Lycklama à Nijeholt, de Bie & Geerling, 2001*).

Titling can result in mass sell-offs increasing land in the hands of a few elite and increasing landlessness among the rural poor (Madeley, 2002) (see Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya).

When a Westerner thinks of land tenure, he/she thinks of land owned by an individual. In Africa, land has traditionally been managed on a communal basis (Chapter 2). Very often in Africa today, governments have taken over where colonial regimes left off, and own all the land and resource rights. There is a tendency through decentralization/devolution processes to return land and associated resources back to these communal systems to assure its sustainable management, though this process is far from complete (see CHAPTER 9: COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT (CBNRM) PROGRAMS - THE WAY FORWARD?).

It is strongly urged that a close look be taken at “common property” management of land and its resources for soils, grazing, wildlife conservation, forest conservation and fishery conservation, since central governments have neither the means nor the manpower to manage and control access to these resources. The open access resource systems which governments inherited from the colonial powers are believed to be at the root of resource degradation on the continent (see Chapter 3, Section 3.4.1, Centralized Control of Natural Resources and the Arrival of Conservation), along with traditional extensive management of resources (e.g., long fallow periods, pastoralists moving from wet to dry grazing areas) becoming impractical and/or diminished as human and livestock population increased in the 20th century (see Section 5.9.3, Fallow Agriculture, Over-Population and Agricultural Production, Chapter 6, Section 6.1.4, Impacts of Colonialism and Post-Colonialism on Pastoralism and African Ecology and Section 6.1.4.7, Impacts on pastoralism and range ecology from increases of human and livestock populations in the 20th century). Sedentarization policies have added to this problem (see Chapter 6, Section 6.1.4.6, Impacts on pastoralism and range ecology from sedentarization policies and privatization policies). There is a crying need for entry into intensive management systems due to the tremendous increase in human and livestock populations, and changes in land tenure [e.g., group ranches in Kenya (see Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya), private ownership of clearly defined plots of land to subsistence farmers in South Africa] that often concentrate humans and livestock into systems requiring intensive management to sustain the populations, while minimizing habitat degradation.

Regardless of whether customary “communal” or freehold land tenure rights are pursued, this will require careful planning and policy analyses, such as defining the land use permissible in a given area, and a minimum size farm/ranch for that

land use beyond which subdivision will not be allowed, in order to prevent both economic and ecological non-viability. Participatory land use planning with rural communities will be required if improved land tenure systems are to be successful. There will be increased pressure for freehold land, which can be used as collateral for financing development of the property. It is strongly recommended that financing and lending institutions devise ways where communally owned and managed properties can also qualify for loans.

5.7.1.1 Niger, land tenure and soil fertility

In Niger, for example, secure land for growing millet accounts for 90% of the manured fields. These fields received an average of 307 kilograms of manure/ha/year, while unsecured millet fields received only 186 kilograms/ha/year (Hopkins, Berry, & Gruhn, 1995 *In:* Gruhn, *et al.*, 2000). Secure tenure does not necessarily imply individual titling, but could imply communally owned and managed land tenure as opposed to state owned or private land tenure.

Williams, Hiernaux and Salvador Fernández-Rivera (2000 *In:* McCarthy, Swallow, Kirk & Hazell, 2000) describe relations between pastoralists and farmers in southwestern Niger in the *Sahelo-Sudanian* (Sudano-Sahelian) zone where rainfall is between 400-600 mm/year (see Chapter 1, Figure 1.3. The Sahel) and the sandy soils are deficient in phosphorus and nitrogen. This area has historically been populated by the Djerma ethnic group, primarily farmers along with livestock-rearing Fulani who have settled in the area about a century ago.

"In the past, farmers obtained manure by arranging contracts with transhumant herders. These arrangements involve farmers' granting grazing rights to crop residues to herders in exchange for the manure deposited by the animals owned by the latter. The farming systems have, however, evolved over the years as a result of population growth and declining rainfall, which have exerted pressure on arable land...The principal cereal crop is pearl millet, which is grown either in sole stands or intercropped with cowpea. Where the land quality permits, sorghum and maize are also grown...Historically in the Djerma culture, land clearing establishes definitive property rights for the farmer regardless of the subsequent use to which the land is put (Breitschuh, 1990 *In: Williams, et al.*, 2000 *In: McCarthy, et al.*, 2000). Such land can be inherited, lent, rented, pledged, or left fallow without fear of being reclaimed. This system comes closest to private ownership, since the owner has full use, modification, and transfer rights, including the legitimate, but highly discouraged, right to sell land (Gavian 1993 *In: Williams, et al.*, 2000 *In: McCarthy, et al.*, 2000). The role of the village chief is to settle disputes and allocate land, held in common or from his own stock, to newcomers. In the Fulani system, ownership of all arable land is vested in the community, under the trusteeship of the village chief. The chief sets long-term use-rights for household heads. Each family head has full rights of modification and inheritance, but does not have the right to lend, rent, or sell the land. Land left in long-term fallow reverts to the community to be allocated to another user. In both systems, fallow or unallocated fields are open to animal grazing, as are cultivated fields after harvest...Farmers in this region have traditionally relied on long fallow periods for regenerating soil fertility. Fallow practices have, however, changed in response to increased pressure on arable land...fallow periods last for 2 to 3 years on borrowed land and 3 to 5 years on owned land—instead of the previous practice of 10 years or more...extension and credit is weak in the Sahelo-Sudanian region. Rural infrastructure is also limited, making the supply of inputs and marketing of farm produce difficult. As a result, farmers make minimal use of purchased inputs, such as fertilizers and feed supplements...Declining soil fertility arising from reduction of fallow periods and farmers' lack of access to mineral fertilizers have created a heavy reliance on animal manure for soil fertility maintenance...Average millet yields in the three villages in 1996 were 713 kg/ha on manured fields, compared with 396 kg/ha on un-manured fields. Manure is obtained from farmers' own animals and through contractual arrangements with transhumant herders.

Unlike in the past when contracts between farmers and herders were based on the exchange of crop residues owned by farmers for manure deposited by the pastoralists' herds, manure is now mostly exchanged for millet grain and cash. This trend has curtailed the ability of poor farmers to enter into manuring contracts with pastoralists and increased their reliance on manure from their own herds" (Williams, *et al.*, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

5.7.1.2 Ghana, land tenure and soil fertility

The lack of reinvestment incentives of sharecroppers in soil conservation/fertility appears to share similar characteristics with government ownership of land. In Ghana, for example, sharecroppers have put enormous pressure on soil fertility to realize immediate high yields in order to pay land rents (Benneh, 1997 *In:* Gruhn, *et al.*, 2000). Farmers in such situations discount the future at very high rates, thereby reducing the incentive for long-term investments in improved soil fertility.

5.7.1.3 Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya

Of Kenya's 587,900 km², only 17.2% is of high and medium potential supporting 80% of the population while the remaining over 80% is arid and semi-arid supporting 20% of the population. The 17.2% land category contains important natural/indigenous forests that serve as water catchments that are under tremendous pressure (Lumumba, 2005 *In:* ACTS, 2005).

The two arid/semi-arid districts of Kajiado and Narok that encompass modern Maasailand cover approximately 36,000 km² of land. Average annual rainfall

varies from 300 to 800 mm in Kajiado and from 500 to 1,000 mm in Narok. In 1979, the average population density was seven persons/km² in Kajiado and 13 persons/km² in Narok (Jaetzold & Schmidt, 1983 *In: Swallow & Kamara In: McCarthy, et al., 2000*).

One of the worst governmental and Western donor (e.g., World Bank) policies ever introduced was the creation of group ranches in Kenya, without regard for ecological complimentarity (a ranch needing wet and dry season habitat for extensive management). Group ranches provided for community ownership of the land, but not the most valuable resource on the land – wildlife – and the right to use wildlife sustainably as an economical resource. Nyika (2007) calls this a tragedy in which “owners of the land also become ‘owners’ of the costs of wildlife, without gaining the benefits, which are ‘owned’ by the state”, the state “indulging in predatory rent seeking, by owning the resource which depends on the land owned by someone else”. There was also a lack of land use planning and zoning (e.g., maintenance of wildlife/livestock habitat). Group ranches were promoted in Kenyan Maasailand for several reasons (*Swallow & Kamara In: McCarthy, et al., 2000*):

- To prevent encroachment into pastoral territories from small-scale farmers;
- To promote efficient use of rangelands;
- To stimulate investment in rangeland development; and
- To encourage pastoralists to market a larger percentage of their animals.

“It was hoped that, overall, the result would be greater offtake of animals and fewer livestock to counter the prevailing trend of overstocking. Group-ranch development began in the mid-1960s and was mostly completed by 1980. Groups of Maasai men were registered as the legal owners of individual tracts of land ranging

from 50 to 1,000 km² (Galaty, 1992 *In: Swallow & Kamara In: McCarthy, et al., 2000*)...Some positive results undoubtedly came out of the development of the group ranches for the Maasai living in Maasailand. Individual appropriation of land was scaled down and the influx of non-Maasai (at least for awhile) into Maasailand was stemmed. Development projects funded the construction of some livestock-production infrastructure, such as boreholes, dams, troughs, tanks, pipelines, and cattle dips. Schools, shops, and health clinics were also established (Ruttan, 1995 *In: Swallow & Kamara In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute)".

Despite this, heavy investment, stocking rates, herd mobility, and marketing behavior did not change significantly.

Indeed, Homewood (1993 *In: Swallow & Kamara In: McCarthy, et al., 2000*) reports that,

"after 20 years of group ranches, there are no significant differences in livestock production, wealth, or human nutrition between the Maasai in Kenya and their counterparts in Tanzania. Negative results commonly noted include the following:

- Poor project implementation;
- Reduction in the power of customary authorities without the development of an appropriate substitute;
- Divergence between the boundaries of group ranches, customary land management units, and ecological units; and
- Elimination of customary property rights without the development of appropriate substitutes (Kituyi & Kipuri, 1991 *In: Swallow & Kamara In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute)".

According to Parker (2005a),

“membership was supposed to pass from father to one son, to avoid endlessly expanding pyramids of more and more members with shares of less and less value. It hasn't really worked. Here and there Group Ranches have hung together, but there are many who simply could not run themselves as ‘cooperatives’. Here, they have subdivided the land into smaller and smaller parcels. With subdivision, the pressure to move out of stock dependence and towards arable practice automatically rises. Here is where the opportunity to sell to outsiders arises...Substantial swathes of Maasailand have substantial arable potential: a great deal of Kenya's wheat is grown in them. Between Nairobi and Kajiado, there is spreading arable farming. At Bissel white farmers have bought land and produce crops. The basis of this expansion by arable farmers into Maasailand is all on a willing buyer/leaseholder - willing seller/lessor basis. Yes, there have been conflicts, but these, to date, are exceptions...Many Maasai are not good farmers and the incentive to sell land is strong: and so they become landless and drift. Yet, while the quotient of such drifters is significant, there is a significant sector who are adapting to farming and cash economies. You don't hear much about them because they have nothing to bitch about. The vocals are those who have lost, failed, been educated but cannot find employment, the 2nd, 3rd and 4th sons who, to keep body and soul together become night watchmen in Nairobi...Do the Maasai feel hard done by? Yes, there are sectors of Maasai society who seem to be destined to be Nairobi's night watchmen (*askaris*), but this is as much, if not more, the product of evolution within Maasai society, than induced by other tribes. There are human density thresholds for nomadic pastoralism; there are human density thresholds for sedentary pastoralism; and there are thresholds beyond which it is imperative to switch dependence from secondary to primary productivity.⁶⁸ The Maasai expansion has been sweeping them across these thresholds before they can come to terms with each set of new

⁶⁸ It is believed that Ian Parker meant to say from “*primary to secondary*” productivity. It could mean either, and both make sense. Going from primary to secondary implies transformation of primary products employing large numbers of people (e.g., cheese and yoghurt processing plants, pasteurized milk for urban centers, etc.). On the other hand, it could mean moving from livestock (secondary productivity up the food chain) that consume grass and are in turn fed upon by humans, to growing wheat and maize (primary productivity moving down the food chain) fed upon directly by humans. The latter scenario is a trend in Maasailand of both Kenya and Tanzania.

conditions. Population and land tenure in Maasailand are very unstable”.

This has resulted in Kenya’s main tourist attraction, Maasai Mara, facing a crisis of ecological unsustainability (Cheeseman, 2002).

“While the theory behind the Group Representatives Act (of 1969) was to try to formalize existing pastoralist range land management systems, which are based on sociologically and ecologically viable land units, the reality of implementation has been quite different and has been characterized by (Barrow, *et al.*, 2000):

- An emphasis on boundaries, rather than on ecological and social viability, and not necessarily based on customary rangeland management systems;
- The group ranch committees often failing to function as they should have, being dominated by elites sometimes to the exclusion of the actual managers of the land and grazing. Elections were not held as regularly as they should have been; and
- Loans which rarely benefited the majority of members, nor the group ranch in general”.

According to Parker (2004), the roots of the group ranch concept lie in the colonial highland agriculture experience (e.g., Kikuyu farmers) and were championed by the UN Food and Agricultural Organization (FAO) of the United Nations for pastoralists right after independence in 1963. Parker (2005b) states the reasons Kikuyu cooperatives function better than group ranches are that:

- The Kikuyu were culturally closer to the idea of private land ownership than the Maasai, and readily adopted the idea thrust upon them following the dying days of the Mau Mau (see Chapter 3, Section 3.11.1, Population, Kikuyu and the Mau Mau);
- The Kikuyu worked closer with the white settlers than any other group and were avid students of their ways;

- The Kikuyu had high standards of farming;
- Their cooperatives were modeled after white cooperatives such as the Kenya Farmers' Association (KFA), or those in the USA, Australia, South Africa and New Zealand in which private landowners came together to market their produce and purchase supplies cheaper in bulk;
- The largest Kikuyu cooperatives were linked to tea.

“There are some co-operatives in which a group ganged together and bought out a white farmer/rancher, then subdivided it into members' plots. Few of these hung together to farm co-operatively. However, if you are seeking the prevailing Kikuyu 'ethic' - it is strongly towards being an independent individual doing his/her own thing” (Parker, 2005a).

There are also the predominantly Kamba Machakos Cooperatives in which ranches are run as economic units and not subdivided by members and which have been successful in running cattle and wildlife (Nyika, *pers comm.*). Barrow, *et al.* (2000) aptly sums up this issue:

“As a result of the many problems facing group ranches, and the politicization of land tenure in Kenya, there has been a push to privatize such lands in the past 10 years. This has resulted in fragmentation, and loss of access to critical seasonal grazing areas, water and salt. Owners now had, but did not necessarily understand the consequences of individual tenure. As a result land was sold, and many poorer pastoralists were marginalized from pastoralism, while the richer and more powerful consolidated and expanded their holdings. In addition outsiders have now been able to acquire such lands”.

“The concept was to divorce Maasai society from communal land tenure in which the bottom line was rule by the lowest common denominator (the Achilles heel of socialism) by giving tenure to identifiable groups who, through ownership, etc. would manage their land better, have assets upon which to raise capital - which had worked extremely well with, for example, the Kikuyu. The application was flawed. Is a group of say 1,000 families all owning shares, really an advance towards private tenure? Isn't it little more

than a pastoralist commune in which the lowest common denominator still rules? And then there was the allocation of the actual group ranch boundaries that gave some wet season ranges and others dry season ranges (here I exaggerate to make the point)...In historical perspective - the group ranches have been no more than a staging post in the drift towards private tenure. Not one has been well managed as a ranch. Some have been less badly managed than others - that is all. As might have been predicted, the more enterprising and ambitious of the ranch members came to the fore at the expense of those lacking these qualities...Pressures arise to subdivide group ranches, the best bits - invariably those with arable potential - naturally going early. The trend of the least able being left on the least desirable land is a product and the cycle is completed when unable to make ends meet, they sell off to the more affluent - and it's the rise of the cattle barons all over again. At that point, economically viable ranching land units will appear - at which point long-term planning will become reality...Group ranches are a halfway house between genuinely communal tenure and private holdings" (Parker, 2004).

Of course, this means that the traditional lifestyles for the majority of the Maasai are on their way out, if not already gone.

Before, during, and after the development of the group ranches in Kenya, many Maasai expressed a demand for individual title deeds (Swallow & Kamara *In: McCarthy, et al.*, 2000).

"Individual titles were first granted for better-watered areas (e.g., Kapiti Plains/Kaputui) close to the urban center of Nairobi. As problems with the group ranches emerged, group ranches were subdivided and areas that had not previously been adjudicated into group ranches were individualized" (Grandin, 1991 *In: Swallow & Kamara In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

According to Nyika (*pers. comm.*), land must be adjudicated (legally allocated) before it can be individualized/subdivided. By 1990, owners of 40 of the 51 group

ranches had decided to subdivide their land (*Swallow & Kamara In: McCarthy, et al.*, 2000). According to Mike Norton-Griffiths (2007), land is subdivided for three main reasons, 1) security from in-migration, avoiding capture by elites and NGOs wishing to confiscate more communal lands for conservation, 2) dilution of communal benefits with population increases and 3) to capture benefits at household level. As this land is subdivided, wildlife that needs large open spaces is crowded out. Ruttan (1995 *In: Swallow & Kamara In: McCarthy, et al.*, 2000)

“conducted research in 2 of 7 subdivided ranches in Kajiado District. In Okinos, the average ranch size was 47 ha, while in Embolioi the average ranch size was 93 ha. Former members of the group-ranch committees obtained ranches twice as large as those received by ordinary members” (Excerpted with permission from the International Food Policy Research Institute).

According to Parker (2005a), “then there is the Maasai inability to cohere which is a source of derision across the rest of the country. Group Ranch Chairmen rip off their members wholesale; County Councilors and MPs do likewise. As a group the Maasai are about as disputatious as it is possible for people to be. I don't think that this is a genetic characteristic so much as the product of their circumstances. But it is a feature that makes them vulnerable to more organized interests”!

“Between 1986 and 1990, more than 33% of all those holding titles had applied for further subdivision of their land for sale to other parties. Ten percent (10%) of all title holders had transferred a total of 2.4% of all of the land. Of the 37 plots sold, 84% were purchased by non-Maasai. Nominal land prices increased nearly 10-fold between 1986 and 1994” (Ruttan, 1995 *In: Swallow & Kamara In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

“A smaller number of pastoralists (2.2% of title holders) had mortgaged their land to receive loans. Very little had been invested in fences, boreholes, or other capital. Most of the proceeds from the sale of land apparently were invested in the construction of modern homes. Thus it seems that the demand for individual titles to rangeland is driven by three main factors. First, the parts of Maasailand with good overland connections to Nairobi, with good

soils, and that receive good rainfall are of high value in non-pastoral land uses. Second, actual demand has resulted in a speculative demand for less-favored areas. Third, people observe that national policies favor private property over common property. The incentive to increase individual investments in grazing land does not appear to be a major factor" (Swallow & Kamara *In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

Amboseli

In 1906, under colonial rule, the 27,700 km² Southern Game Reserve, which includes present-day Amboseli, was created. In 1948, the reserve was reduced to 3,260 km², named Amboseli National Reserve and placed under the administration of the National Park Trustees. In 1961, it became a County Council Game Reserve administered by the Olkejuado (Kajiado) County Council. In 1971, a Presidential Decree declared that the 390 km² surrounding the main swamps in the ecosystem be used exclusively for wildlife and tourism. Since October 1974, Amboseli has been run as a national park by the Kenya Wildlife Service (KWS) and preceding government bodies (Moss, 2005).

Originally touted as a success story with a core protected area and surrounding buffer with watering points for cattle (Ledec & Goodland, 1988 *In: Colchester*, 1994), the Amboseli National Park and environs have become zones of conflicting land uses. Beginning around 1981,

"the water supply system began to deteriorate. Compensation fees went unpaid. The school was inappropriately located. Little tourism developed outside the park. Royalties accrued to central government and the local district council but failed to trickle back down to the local level" (Peluso, 1992; Hannah, 1992 both *In: Colchester*, 1994).

The Maasai have been unhappy and disgruntled ever since (Moss, 2005).

Since only 1% of the gross revenues from the Amboseli National Park in 1990 went to the peripheral Maasai communities (Emerton, 1998) and as a result of the government policy of subdividing group ranches, many of the young Maasai wishing to enter into a market economy sold or leased critical dry season grazing land to small-scale farmers. The community revenue from Amboseli amounted to US\$ 150,000 in 1990 out of US\$ 15 million of wildlife revenues (Norton-Griffiths, 1996 *In: Barrow, et al.*, 2000).

In many cases, once individual ownership of land existed, bank loans were taken out against the land, which were not paid back. The bank foreclosed or confiscated the land, often selling it off to small-scale farmers. Many Maasai became landless and started wandering with their herds, which often resulted in conflicts with those still holding land (DeGeorges, 1991). The loss of dry season grazing habitat around Amboseli from the sale to small-scale farmers, has forced both wild and domestic animals into the Amboseli National Park during the dry season, strongly contributing to the degradation of this park as its carrying capacity to support herbivores has been exceeded. Airline passengers flying from Nairobi to Mombassa or tourists driving from Loitokitok to Amboseli can see a bright red cloud of dust over the park. This dust is raised by the destruction of vegetational cover from the unnatural concentration of wildlife and livestock during the dry season, and excessive vehicular traffic from mass tourism (DeGeorges, 1991). Despite all of this, it is argued that the Maasai still maintain a positive attitude towards wildlife. Despite all of the land use changes, wildlife populations in the Kajiado District, where Amboseli is found, have decreased by only 15% over the last 20 years; numbering 175,260 in 1977 and 148,770 in 1994 (Grunblatt, Said, *et al.*, 1995; Rainy & Worden, 1997 both *In: Barrow, et al.*, 2000). This compares to losses in wildlife numbers of from 40-80% in other rangelands in Kenya (Barrow, *et al.*, 2000).

Elephant researcher Cynthia Moss's Amboseli Trust for Elephants has been trying to make up for failed promises from the Kenya Wildlife Service (KWS) (Moss, 2005):

- Making livestock consolation payment scheme since 1997 for cattle, sheep and goats killed by elephants;
- Giving scholarships and living expenses for Maasai students from Amboseli to attend university;
- Giving scholarships for girls to go to secondary school;
- Giving employment to seven research scouts, a Maasai liaison officer, camp workers, and research assistants from the local community;
- Helping local people find jobs in tourism and wildlife;
- The Trust's project manager is a member of several committees set up to deal with Maasai issues; and
- Supporting a major project trying to find ways to alleviate human-elephant conflict where Maasai have started to farm.

In a surprising, bold and some say a political move to get the Maasai vote for the draft Kenyan constitution (Obat, 2005), President Mwai Kibaki signed a decree on September 29, 2005, which officially degazetted the Amboseli National Park, turning it over to the Olkejuado County Council to be run as a national reserve. Gate receipts and other revenue will go to the County Council instead of Kenya Wildlife Service (KWS) that runs the national parks.

“The rules and regulations for reserves are more flexible regarding human activities within the boundaries, whereas conservation and tourism are supposed to be the only activities within National Parks” (Moss, 2005).

Various conservation groups are contesting this change saying it is in violation of the Wildlife Conservation and Management Act (Obat, 2005). These groups include the East African Wildlife Society, the Youth For Conservation, the Centre for Environmental Legal Research and Education, and the Born Free Foundation. They have taken the matter to court and temporarily suspended the resolution contained in a legal notice dated September by Tourism minister Morris Dzoro to downgrade the Amboseli Park (Kadida, 2005). Time will tell whether this bold step proves beneficial to peripheral Maasai or, as will be seen below with Maasai Mara, whether it will be a source of power and income to be misused by a few elites within the Country Council. However, it would seem to be the correct direction to take. Concern has been raised about a lack of trained personnel to run the reserve (Moss, 2005), a problem throughout Sub-Saharan Africa. On the positive side, devolution of tenure over the land and resources to the Maasai could help reverse the 20th century trend where the human population, alienated by the elitism of conservation, has accelerated the conversion of Sub-Saharan Africa's natural areas into man-made systems (e.g. pastures and farms). The referendum on proposed constitutional changes was defeated in November 2005 (Mageria, 2005), resulting in further political and economic upheaval. In early 2006, massive corruption scandals, involving a number of ministers, have come to a head.

Maasai Mara

"In 1988 the 122,500 visitors to the Maasai Mara National Reserve accounted for over 10% of all tourist bed nights in Kenya. In addition to spending money on accommodation and Reserve fees, tourists also directly supported a range of other enterprises, including balloon safaris, sales of handicrafts and various travel and transport-related purchases. Total tourist expenditure for the area was over US\$ 26 million. However, although almost twice as many tourists visiting the Maasai Mara stayed - and most wildlife was found - on communal lands rather than in the Reserve, less

than 1% of cash income accrued to local Maasai and under 10% remained in the District as (local county) Council revenues or wages to local employees" (Emerton, 1998).

Simultaneously, a sudden demand for wheat and barley by Kenya's new middleclass inspired investment in Green Revolution technologies. This resulted in the conversion of land in an area that had been considered too dry for agriculture, making the Narok District Kenya's leading producer of both wheat and barley by the mid-1980s (Cheeseman, 2002). The average Maasai, seeing no value in wildlife, opted out by selling or leasing his land to commercial wheat schemes. These wheat schemes increased from 404,858 ha (1 million acres) in 1981 to 1,214,575 ha (3 million acres) by 1992 (Bonner, 1993). Many of these areas are critical rainy season dispersal areas for wildlife in the Mara. Large numbers of wildlife that disperse out of the Mara are shot as problem animals. One farmer alone shot 3,000 head of game in one year (Bonner, 1993). Dry season habitat is the bottleneck to carrying capacity for both livestock and wildlife. The agricultural potential here is greater than that for either livestock or wildlife tourism (Parker, 2004). Similarly, just across the border in the western Serengeti of Tanzania, "wildlife populations continue to decline as farmers continue to clear land for cultivation rather than wildlife" (Emerton & Mfunda, 1999 *In:* Roe, Mayers, Grieg-Gran, Kothari, Fabricius & Hughes, 2000) (Also see, Section 9.7.8.2, "Politics of despair", Southern Maasailand "Tarangire Ecosystem", where seeing little value in wildlife, critical rainy season dispersal areas are being over-grazed with livestock, or converted to small and commercial farms with the net result that there has been a major reduction in wildlife within the system).

Overall, in Kenya, it is estimated that "large herbivores in the rangelands have declined by 40–60% between 1977 and 1994" (Child, 2005 *In:* Lyman & Child, 2005). Ottichilo (1996 *In:* de Haan, *et al.*, 1997) reported a 30% decline in

Kenya's wildlife populations as a whole over the last 20 years. Norton-Griffiths (2007) estimates the total loss of large wildlife in Kenya since 1977 at 60-70%, with equal amounts being lost within and outside of protected areas.

Game populations in the Narok District have declined by 32% between 1977 and 1994, from 522,588 to 356,679 (Grunblatt, Said, *et al.*, 1995; Rainy & Worden, 1997 both *In:* Barrow, *et al.*, 2000). Within the dispersal areas of the Mara ecosystem, wildlife populations declined between 1977 and 1993 from 217,871 to 66,535, respectively and then started to increase between 1994 and 1996 to 130,242 and 243,374, respectively (Barrow, *et al.*, 2000). The apparent increases in wildlife in the Mara Ecosystem between 1994 and 1996 in Barrow, *et al.* (2000) may not be because of community involvement, but due to compression (loss) of the wildlife habitat, forcing wildlife to concentrate into smaller areas (Barrow, *et al.*, 2000). Waithaka (2004) describes the following tendencies with regard to wildlife populations within the Mara Ecosystem⁶⁹ that show a consistent decline as opposed to the fluctuating numbers in Barrow, *et al.* (2000):

- 56% overall decline in wildlife for most species in the last 20 years;
- White-bearded Wildebeest (*Connochaetes taurinus albojubatus*), 81% decline, 1977-97, especially in the Loita plains – the main calving and breeding grounds that have been converted to wheat fields;
- Cape Buffalo (*Syncerus caffer caffer*) decline from 15,400 in the 1970s to 3,000 in 1994;
- Eland (*Taurotragus oryx pattersonianus*) from 5,700 in the 1980s to 1,025 in 1996;
- Kongoni/Bubal Hartebeest (*Alcelaphus buselaphus cokii*) from 4,150 to less than 1,400 over the last 20 years;

⁶⁹About 80% of the Mara ecosystem is found in the Narok District (Nyika, *pers. comm.*), the remainder being in the Trans-Mara District

- Topi (*Damaliscus korrigum*) declined from 20,748 in 1988 to 8,900 in 1996;
- Warthog (*Phacochoerus aethiopicus*) decline by 88% from 1988-1996; and
- 72% decline in giraffe (*Giraffa camelopardalis*), common waterbuck (*Kobus ellipsiprymnus*) and other antelope from 1988-1996.

This decline can be attributed to land use change and habitat fragmentation, particularly in the north and northwestern parts of the ecosystem, where wheat and maize production has increased (Barrow, *et al.*, 2000; Waithaka, 2004).

Norton Griffith (1996 *In:* Barrow, *et al.*, 2000) argues along the lines of Parker that the revenues that Maasai Mara generates from wildlife may never be as high as alternative land uses. Group ranches around the Mara are providing hidden subsidies for conservation, as well as the costs of lost production. Conservation managers will have to meet these costs through improved financial arrangements, as the potential value of the land cannot be denied to the owners, and the Maasai cannot be condemned to a perpetual poverty trap in the name of conservation. This implies that wildlife must pay for its existence or risk to have its habitat converted to wheat. This will require wildlife and its many uses to be open to a free-market, and/or the conservation community compensating the Maasai landowners in perpetuity for maintaining their ranches as extensions of the Mara ecosystem. The latter is unlikely, and as Ian Parker feels, it is not evident that wildlife can compete with wheat. In the long-term many of these areas may have to go under the plow to help Kenya stand on its own feet economically and to feed itself.

In Kenya as a whole, Norton-Griffiths and Southee (1995 *In: de Haan et al.*, 1997)

“estimated the foregone revenue from livestock and agriculture from the parks at US\$ 203 million, whilst the revenue from these parks amounted to only US\$ 42 million”.

Norton-Griffiths (*pers. comm. In: Magome & Fabricius, 2004 In: Fabricius, et al., 2004*) suggests that once the mean annual rainfall exceeds 600 millimeters, wildlife will have a difficult time out-competing the same land converted to agriculture. Sad but likely true! In fact, it is estimated that more than 50% of Kenya’s higher potential land (>700 mm annual rainfall) has already been converted to agriculture that displaces wildlife, but is inclusive of livestock (Norton-Griffiths, 2007). In addition, as currently practiced (e.g., little or no sustainable use, especially trophy hunting), Norton-Griffiths (2007) estimates that

“average returns to wildlife of US\$ 10 ha/yr are competitive with agriculture only in very dry areas of below 300 mm of annual rainfall, and with livestock below 600 mm annual rainfall... (in fact) net returns from livestock could be some 66% higher were wildlife to be eliminated” (for additional comparisons of wildlife versus livestock values see Chapter 9, Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa and for displacement of wildlife by farms and livestock see Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”).

According to Child, Castley, Knight, Gordon, Daitz, Johnson, Boonzaaier, Collinson, Davies, Grossman, Holden, Kiss and Fernhead., (2004 *In: Child, B., 2004a*) resource management of the core tourism area, the Mara Triangle, was contracted out to Mara Conservancy Pvt., Ltd. responsible for managing 34% of the gate revenue based upon monitored performance criteria. However, members of the County Council are not entirely committed to this change as it results in a loss of influence and patronage opportunities. This is a legal arrangement between the Trans-Mara County Council and the private company. The Mara

Conservancy collects gate receipts, maintains infrastructure and anti-poaching among other activities. The goal of this relationship is to stem the loss of money from corruption. Members of this company are non-Maasai and non-resident of the area, but are Kenyans. Concern exists that any gain in revenue from stemming corruption by this conservancy group is taken out of the area in salaries and fees paid to this company, with little or no increase in benefits being seen by the average Maasai (*Nyika, pers comm.*).

In many areas of Kenya, a combination of the above-noted factors is resulting in major tension between pastoralists and farmers. A combination of land compression among both the Maasai and Kikuyu during the colonial era, the population explosion of the 20th century, and poorly thought out land tenure policies (group ranches) has resulted in major conflicts between land-hungry Kikuyu farmers who moved into the Narok and Kajiado Districts, especially Loitokitok and Kaputei in Kajiado District, as described above, and the Maasai (Figure 5.6). In October 1993, about 30,000 Kikuyu were chased out of a Maasai area, Enosupukia (between Nairobi and Narok) and 20 people died (Richburg, 1994). Parker (2005a) attributes part of this problem to the close ties between the Maasai and Kikuyu.

“Their biggest difference is linguistic - the Maasai speaking a highland Nilote language, and the Kikuyu a Bantu tongue of the north-eastern Bantu group...The structure of society was similar, customs were broadly similar, shield patterns, age sets, weapons and military tactics had a great deal in common. Some Kikuyu “*mbari*” (sub-clans) had Maasai founders. The great Maasai leader Batiaan had a Gikuyu name - Mbatia wa Gaterimu - and the Kikuyu say he was born a Kikuyu on the Chania. While it may not be entirely correct, viewing the Kikuyu as agricultural Maasai, is at least as accurate as seeing them as Bantu and possibly a little better. The consequence of this is that there is and has been very substantial intermarriage between Maasai and Kikuyu. This is extending arable farming deep into Maasailand and intermarriage between educated Maasai and Kikuyu is probably higher now than

at any time past. My point, a clear cut division between the two groups does not exist and is continually eroding" (Parker, 2005a).

These conflicts are ongoing. According to Nyika (*pers. comm.*), similar conflicts existed in 2004/5 between Maasai and Kamba in the Kajiado District, the Maasai and Kikuyu/Kalenjin in the Narok District, the Maasai and Kisii in the Trans-Mara District, the Samburu with Turkana herders moving South into the Baragoi Division of the Samburu District, and Samburu herders moving onto white ranches in the Laikipia District during droughts, which have been frequent in recent years. Land and resource access, as well as land use and tenure are and will continue to be major sources of conflict and threats to the future of wildlife in Kenya. Majtenyi (2005) describes the continual clashes over land and water between the Maasai and Kikuyu in the Rift Valley.

The late 2007/early 2008 flare up between Kikuyu and other ethnic groups over whether the Kikuyu, through President Mwai Kibaki of the Party of National Unity (PNU), won free and fair elections against Raila Odinga, a Luo of the Orange Democratic Movement (ODM), has resulted in over 650 deaths by mid-January (Wadhams, 2008), some say 1,000, and 250,000 internally displaced people (VOA, 2008). The disputed presidential election may have been the proximate cause, providing oxygen to the burning embers, land and resource scarcity being ultimate causes among others such as high unemployment, poverty, terrible urban slums, and a struggle between ethnic group(s) to control power and thus privileged access to land, jobs and other resources. Much of the conflict pits Kikuyu that make up 20% of the population against other tribes, especially Luos, Luhyas and Kalenjin (Wadhams, 2008) over the skewed distribution of land to Kikuyu's, associated with President Jomo Kenyatta, 45 years ago at independence (Latham, 2008). Parker (2008) contends that Odinga is a socialist that the Kikuyu will never accept, who wishes to end freehold/private land tenure of the 4 million title deed holders, 99% black and most, but not all, Kikuyu. The worst violence is

occurring west of the rift where Kikuyu were settled on former white-owned farms during the Kenyatta era, where Kalenjin who feel robbed of their land, are fighting Kikuyu. Strife in Western Kenya is purely ethnic cleansing of mostly successful Kikuyu shopkeepers, land not being the major issue, but envy.

It is believed that over much of Sub-Saharan Africa today, these internal conflicts over scarce resources may be as serious as large-scale civil wars on the subcontinent, with little or no coverage by the international press (see Sections 5.11.2, Over-population, Desertification and Instability, Nigeria and 5.11.4, Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics). According to the Commission for Africa (2005) countless smaller conflicts, which are no less vicious, such as those between herders and cultivators, are to be found in many parts of Africa. Violence causes as many deaths in Africa as does disease. Eventually, smaller conflicts can lead to civil or regional wars. For instance, one might ask how much of the conflict between Rwanda and the DRC is over the need for land by an over-crowded Rwanda, which suffers continually, along with Burundi with internal conflicts over scarce land/resources. These conflicts have become ethnically divided when the resource to people ratio becomes significantly reduced (see Section 5.9.4.6, Deforestation in afromontane forests; Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization)?

Kenyan conservation is intimately tied to the Maasai and how they utilize their land. As human populations increase, the net result of decreased fallow, in addition to soil degradation, is expansion onto marginal lands by small-scale farmers, in this case Maasai lands by Kikuyu farmers. This results in increased conflicts between pastoralists and farmers, declining wildlife habitat and a net decrease in available land per capita throughout Sub-Saharan Africa. Norton-Griffiths (2007) argues that the entire economic system of rangeland production in Kenya has undergone a radical transformation since the mid-1970s: the human

population growing at >3%/yr; cultivation growing at >8%/yr; livestock numbers remaining stable, even with offtake growing at >4%/yr; and wildlife decreasing by >3%/yr per annum. It is interesting to note that there appears to be a direct relationship between the increase in human populations and the decrease in wildlife (large herbivores). Other than South Africa, Namibia and to some degree Botswana, where wildlife has value to the landowner (see, Section 5.12.7, Attaining Food Security through More Appropriate Land Use Options, Wildlife as a Land Use Option on Marginal Lands), this relationship is a trend across the subcontinent. For additional discussion on this issue, see Chapter 10, Section, 10.4.5 Does CITES Help Southern African Elephant Conservation?

Meanwhile, Kenya Wildlife Service (KWS) policies do not endear rural Kenyans to wildlife. Although group ranches in the area, can apply to the Kenya Wildlife Service (KWS) for wildlife utilization rights, this requires demonstrating the ability to manage wildlife, undertaking game counts, having access to a veterinarian approved abattoir, etc.

“To make wildlife a viable land use option, extensive range areas are required. Communities and land users have responded to this by organizing themselves into Wildlife Associations, Forums, Conservancies and Trusts” (Barrow, *et al.*, 2000). According to Barrow, *et al.* (2000), the “pilot wildlife use rights” program, currently in operation in Laikipia, Machakos and Nakuru Districts, is a clear demonstration of how, in some places, communities who have wildlife on their private land, can earn money through their own enterprises on a long-term, sustainable basis”.

However, even in those few areas with user rights, most income comes from the sale of meat, which, with veterinary restrictions, is limited to sale in Kenya. Only a few outlets, such as the Carnivore Restaurant, are willing to pay premium prices for game meat. Game products made from horn and skin are illegal to sell as souvenirs, while game skins cannot be tanned with hair on. The added value of

transformation is obtained by other countries, such as South Africa and Botswana, who purchase all the zebra skins they can get their hands on. Minimal income can be earned from game bird shooting. Game bird shooting is so minor as an economic resource, in the early 1990s, when the principal author lived in Nairobi, he was given a permit to shoot ducks, without limit as vermin, Problem Animal Control (PAC), on the Mwea Rice Scheme. In recent times, there have been attempts to market Kenya's excellent bird shooting. However, without overseas trophy hunting, stopped in 1977 under pressure from the World Bank and other donors, combined with the above activities, group and private ranches can only ever make minimal income from wildlife, with no real incentive to conserve it or its habitat (see Chapter 9, Section 9.6.1.2, Kifluku Farm, Laikipia, Kenya).

Norton-Griffiths (2007) identifies the decline in Kenya's wildlife despite hundreds of millions of dollars provided by the international donor/NGO community due to three areas:

1. policy failures, including wildlife tenure by private and communal landowners, most importantly a failure to fully accept consumptive use including hunting that disenfranchises 95% of the pastoral rangelands; wildlife tourism being restricted to only 23,000 km²/5% of the rangelands where wildlife are found;
2. institutional failures including the Kenya Wildlife Service (KWS) claim of ownership over all wildlife and biodiversity, its role as a regulator and policeman instead of a facilitator to encourage wildlife as an economic resource and best land use in low rainfall areas by landowners other than itself, and communal institutions often being controlled by elites with the result that they fail to meet the needs of ordinary members, and
3. market failures, especially private sector tourism cartels that keep the lion's share of the profits, landowners (including KWS, county councils and private landowners) capturing only 5% of the total revenue generated by wildlife.

In addition to devolving ownership of wildlife to landowners - assuring their right to benefit from wildlife, development of negotiating skills that allow communities to capture more of the wealth from wildlife during contract negotiations, and

compensation for wildlife damage to landowners, Norton-Griffiths (2007) recommends the adoption of what he calls private sector conservation (PSC). This is basically the Southern Africa model, where the landowner controls access over and determines how he/she uses the wildlife as an economic resource in a free-market, with certain limitations regarding animal welfare, biodiversity and ethics (see Chapter 3, Section 3.5, DEVELOPMENT OF HUNTING ETHICS IN AFRICA and Chapter 9. Section 9.8.3, Devolution on Private Game Ranches, Southern Africa, Short-Term Success, Long-Term Failure?). He places much of the blame on Western NGOs for wasting money and failing to adopt this economic wildlife model. For additional discussions, see Chapter 11, Section 11.11.9 Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact on Kenya's Wildlife Outside Parks.

5.7.1.4 Land tenure in Laikipia, Kenya

As discussed in Chapter 3, Section 3.8.4, Land Compression and the Maasai Of Kenya and Tanzania “on August 15, 1904, the Maasai signed a treaty with the British colonialists leasing to the British about 1,000,000 ha of land in Laikipia district for 100 years. British settlers subsequently moved onto the land and set up large ranches that remain there to this day” (Majtenyi, 2004a). The expiration of the lease in August 2004 was marked by a series of demonstrations and land invasions by Maasai herdsman cutting fences surrounding private ranches. According to Cabinet minister William ole Ntimama, an ethnic Maasai had the following to say,

“ ‘What has really prompted the invasion is the drought and the fact that there is no water outside those fences,’ he said. ‘Those poor pastoralists are totally desperate. They do not know what to do when they see dams and pipes of water just next to the land and they see good grass and they are suffering, their cattle are dying of drought, and they themselves are hungry and some of them could be dying’ ” (Majtenyi, 2004a).

On August 25th, 2004, the public service minister urged the Kenyan government to pay the Maasai US\$ 123 million as compensation for the land that had been leased to the British. The Kenyan government has refused demands by the Maasai for the return of their land on the grounds that the lease by the Maasai to the British is for 999 years not 99 years, property laws since independence override colonial agreements and that if the lease ends, the land comes back to the Kenyan government. They are concerned that the land issue could destabilize relations between Kenya's 40 ethnic groups, and spark an uncontrolled re-occupation of land as various leases expire (Majtenyi, 2004a). For instance, because of a similar 99 year lease agreement expiring with the British, the Sabaot community threatened to invade farms in the North Rift region extending from Murukujit in West Pokot to the Kimilili Constituency to the west and again from the River Suam at the Uganda border to the River Nzoia in the Uasin Gishu districts of Kenya (Maero, 2004).

Most of the Laikipia ranches are owned by whites, either the descendants of British colonials and/or wealthy outside investors, increasingly Western conservation NGOs, and some high ranking Kenyan politicians and military officials. The Kenya Land Alliance believes that the skewed distribution of land in Kenya must be addressed as planned under the draft constitution. Maasai activists are prepared to take their case to the Kenyan High Court and the International Court of Justice to get their land back (Majtenyi, 2004a).

5.7.2 Creation of Parks and Protected Areas, a Constraint to Good Land Management

Gazetting lands for parks and protected areas increases tenurial insecurity for those living in environmentally sensitive areas and is a major disincentive to investing in sustainable agricultural intensification. The bitter irony is thus that pressures for environmental conservation (e.g., the IUCN goal of seeing 10% of

Africa's land mass in parks and protected areas) may induce environmental degradation by threatening traditional common property management systems, the land and its resources (Reardon, *et al.*, 1999). Also, as discussed, during colonial times, the creation of such areas without fully integrating the needs of local people into them resulted in land compression and rapid degradation of resources in peripheral areas, plus the alienation of rural Africans towards protected areas. This turned protected area resources into unmanaged "open access" regimes that were poached and mined for short-term gains. The risk is that these parks and protected areas will become hard-edged, that is surrounded by masses of alienated humanity living in poverty who will eventually, in trying to survive, destroy the very natural systems that are in need of protection (see Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers and Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks and Protected Areas).

5.7.3 Lack of Planning as a Constraint for Agricultural Production

There is a general lack of land use planning in Africa, both for the development of urban and rural environments. There is a need to identify crucial commercially viable agricultural food-producing land and to develop long-term plans to assure that this land is maintained in commercial food production to feed the growing urban masses. This will become necessary in order to prevent Sub-Saharan Africa from becoming dependent on donor food aid and in return susceptibility to political manipulation by the West, already a growing problem.

"As the population growth and the demand for suitable agricultural land increases, there is need for a planned assessment of agricultural potential in Africa. Soil taxonomy provides a basis for assessments of soil resources, especially using small-scale regional maps and more detailed national and local assessments. The information, when incorporated into a Geographic Information System (GIS), becomes more useful by providing greater

analytical capabilities and facilitating the creation of interpretive maps. Data can also be manipulated to give a 'best guess' where data is scarce or of unknown quality, as is often the situation in Africa. With socioeconomic and other data layers, realistic national assessments and appropriate strategic plans can be developed" (Eswaran, *et al.*, 1996).

5.7.4 Land Reform/Redistribution without Integrating Local Communities as a Constraint to Agricultural Production

Land reform is primarily an issue in Southern Africa, where comparatively large numbers of descendants remain from original settler colonies, controlling a majority of the good agricultural lands. Without land redistribution on a significant scale, millions of smallholders in Southern Africa will face a very grim future unless there is increased off-farm employment in urban centers to diffuse this pressure and demand for land. Certainly in "today's Africa", many of the youth prefer the allure of bright city lights, especially once provided with a Western Education.

"Top-down land redistribution offers the prospect of limited change – bogged down by expense – that does not significantly improve economic and social opportunities because it ignores smallholders' understanding of the conditions under which land can contribute to improved livelihoods. Exclusively market-based redistribution will not necessarily mean improvement in access to land among the rural poor (although it may increase overall agricultural resource-use efficiency). There is an urgent need to bring the smallholder voice into the process – not only with regard to the "whether" of land reform, but also the 'how'...the situation in parts of southern Africa is now favorable for land redistribution, to the extent that the economic value of this asset to the large-scale current owner is low or declining. In Zimbabwe, a significant portion of the land held by commercial farmers is/was unused...In Namibia and South Africa, the economic value of many large holdings has declined as a result of the elimination of subsidies (which have always been captured, throughout the region, much more by large-scale farmers than by smallholders). In Malawi, the value of estate land is probably declining as market access privileges are eroded. In such circumstances, there may be a solid

basis for the application of the ‘willing buyer, willing seller’ principle” (IFAD, 2002).

Once land is distributed, education and extension become key, if small-scale farmers are not to degrade once productive commercial lands. Keeping land redistribution apolitical will also be a key to success. There are few models of successful large-scale land transfer in favor of smallholders in the region (IFAD, 2002).

Land reform is primarily a southern Africa issue. Land reform, to rectify its inequitable distribution between white and black Zimbabweans, became radicalized as a means of President Robert Mugabe and his political party Zimbabwe African National Union – Patriotic Front (ZANU-PF) staying in power. This has had adverse impacts on food production, conservation, utilization of wildlife, and both national and regional economies. Poorly thought out internal and regional policies that result in economic ruin and uncontrollable immigration by the poor, hopeless disenfranchised masses could end any hope for an “African Renaissance”, and end any hope for Africa’s people to benefit from the technological solutions to development that the subcontinent’s economic engine, South Africa, may have to offer.

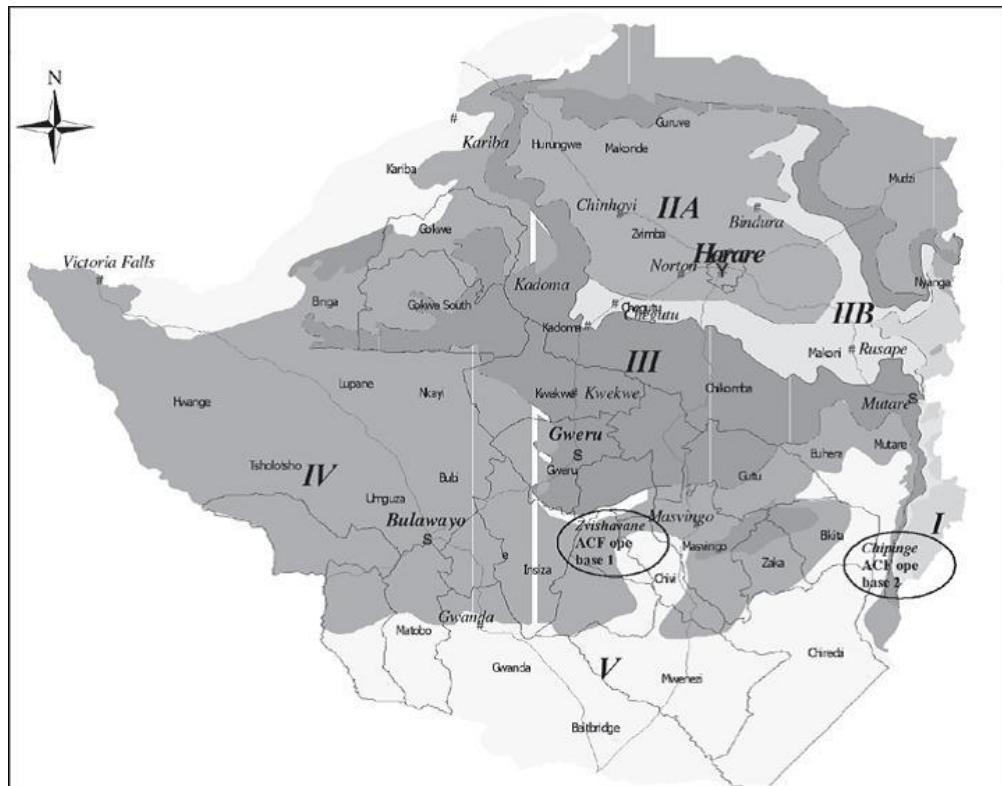
5.7.4.1 Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife

This case study is summarized in DeGeorges & Reilly (2007). The Land Tenure Act of 1969 favored white appropriation of the best agricultural land at a time when the whites made up only 5% of the population. Although the land ownership was evenly split between white and black, approximately 18 million ha for whites and 18 million ha for what were called “*Tribal Trust Lands (TTL)*”,

thousands more blacks were evicted from their lands. What appeared as a move towards equity was just the opposite (Wels, 2000; Meredith, 2002).

- **Allocated To Whites.** Prime farmland, including 75% of the land in agro-ecological Region I and 66% in Region II; and
- **Allocated To Blacks.** The majority of the poorer soiled, unreliable rainfall agro-ecological zones; 74.2% of their land falling in Regions IV and V (Wels, 2000).

The five agro-ecological zones of generalized land use potential are based primarily on the amount and reliability of rainfall (Figure 5.7).



Source: ACF (2006) with permission, Action Contre La Faim (ACF)

Figure 5.7 Agro-ecological Zones, Zimbabwe

About 80% of Zimbabwe averages less than 800 mm rainfall/year, mostly in Regions III, IV and V. These low rainfall areas, where the majority of black Zimbabweans are compressed, are best used for harvesting natural vegetation

from either wild or domestic herbivores, unless supplemented by irrigation. Induced by need, tradition and Government to practice rainfed agriculture (Child, 1995), and with little or no training in modern intensive agricultural practices, the soils of these marginal areas were quickly depleted by a rapidly expanding black population.

White commercial farmers received subsidies in the form of price controls, fodder in droughts, cheap labor, state investments in control of endemic livestock diseases, infrastructure such as abattoirs and fencing, while communal lands were subjected to compulsory destocking, providing livestock to white commercial farmers at below-market prices (Phimister, 1978 *In:* Bond, *et al.*, 2004 *In:* Child, B. 2004a).

At independence in 1980, Zimbabwe inherited a dual agrarian structure of 6,500 predominantly commercial “white” farmers producing 90% of the maize and cotton and 99% of the tobacco, while 700,000 black smallholders produced the remainder. Before the structural adjustment programs of the second half of the 1980s and the first half of the 1990s, the Government developed rural feeder roads and depots to provide reliable market access, subsidized farm credit programs, subsidized fertilizer and seed inputs, and expanded extension services to smallholders - conditions that in the early 1980s, provided the incentive and capacity for smallholders to adopt long-available hybrid maize varieties. Using hybrid maize varieties developed in Zimbabwe, from 1979-1985, Zimbabwean smallholders were producing 30% of the marketed surplus maize (tripling their maize production), up from 10% in 1980. They sold 60% of this increase in maize output. However, 70% of this increase came from only 10% of the smallholders who had the best watered land in higher rainfall areas (Eicher, 1990 *In:* Eicher & Staatz, 1990). Many Zimbabweans also feel that the collapse of industrialization, strongly linked to World Bank and International Monetary Fund (IMF) structural adjustment policies, resulted in massive retrenchments in urban centers, forcing

people back onto the land (Murphree, 2001), exasperating an already existing land hunger in the over-crowded homelands, and the end of government support to many of these farmers.

The white farmers controlled 40% of the country's total land area, including 67% of the country's high potential land, while 700,000 smallholder households were crowded into marginal and degraded TTLs, most of which lay in semi-arid parts of the country or in areas with poor soils. The TTLs were explicitly regarded as labor reservoirs from which the formal agricultural, manufacturing and mining sectors would draw their manpower (IFAD, 2002). On the positive side in 1986, Zimbabwe alone could have made up the 1.6 million ton shortfall in grain needed by 18 Sub-Saharan African countries (Rosenblum & Williamson, 1987). With commercial agriculture and the development of regional infrastructure and markets, Africa can potentially feed itself. Unfortunately, as will be seen, this capability has been destroyed in Zimbabwe due to internal politics and cronyism.

Fighting over Fences

A major issue facing land reform in Zimbabwe and the rest of Southern Africa is the significant difference in how black and white Zimbabweans relate to the land. Traditionally for the black Zimbabwean land belongs to the ancestors and through the lineage group is allocated by the village head/chief to a head of household. It is returned to the lineage group for redistribution when the household stops farming the plot of land and/or the head of the household dies. No individual can own a piece of land. For the white Zimbabwean, based upon his/her European ancestry, land is owned with a title deed, demarcated and fenced by an individual; a commodity which can be bought and sold. The black Zimbabwean relates to land as something sacred tied to his/her ancestors, whereas the white Zimbabwean relates to the landscape - nature, the wildlife and the products that he/she can obtain from the land, but which the black Zimbabwean feels must be returned to

his/her ancestors (Wels, 2000). The liberation war of Zimbabwe or “Chimurenga” was fought over rectifying the brutal injustices with regards to land and the liberation fighters were known as *Vana Vevhu* or “children of the soil” (Lan, 1990; Murombedzi, 2003 *In:* Adams & Mulligan, 2003).

One way of protesting the loss of land is by hunting, which is deemed “poaching” by whites, landowners and Government. The black African traditionally hunted to live as a form of subsistence. Hunting by black Africans continued for subsistence, cultural and religious purposes, but also as a means of protesting against the confiscation of their land by private individuals and by Government. Breaking the law by poaching created a distorted Western media image of traditional hunters destroying their and humankind’s heritage – wildlife. The struggle about land can be described as a “war over fences” in which the black African is stereotyped as a potential poacher and every white man is a land robber. It has led to a fundamental distrust between black and white in southern Africa when it concerns land and hunting (Wels, 2000)! The politics of the issue center on broad support for an end to the existence of what are essentially white pockets of prosperity surrounded by black poverty (Carney & DeGeorges, 2000). It is thus no wonder that during the Zimbabwe land invasions, one of the first things that happened was the elimination of wildlife by the invaders – a form of eco-retribution!

The fence signifies the general paradox and dilemma of a white wildlife utilization scheme in southern Africa. The fence is necessary to make economic profit through sport hunting, and to make wildlife utilization economically viable. Thus, without a fence, there would be no attractive hunting packages, profit, sustainable business, conservancies, or community investments. At the same time, the fence blocks community relations because it symbolizes the type of domination, which black Africans have protested about and fought against ever

since the advance of the whites in southern Africa: the latter's domination of the land (Wels, 2000).

Lancaster House Agreement, a Hindrance to Radical Land Reform

The Lancaster House Agreement of 1979, which was signed between Great Britain and Zimbabwe at independence made a radical approach towards land redistribution impossible. This new constitution, negotiated with the British, saw to it that designated national parks boundaries were maintained. The constitution only recognized farmland that had boundaries demarcated by beacons, placed by the Surveyor General's Office, and written title deeds. African-owned land based on oral tradition, without such qualities, was not recognized. The Lancaster House Agreement was valid until 1990. It hindered radical land reform because: 1) Government purchased land must be acquired on a willing buyer, willing seller basis, and 2) Government must compensate owners of the purchased land in foreign currency. This solidified the economic strength of the white commercial farmers through freehold land tenure (Wels, 2000; Meredith, 2002).

Attempts to convert rural villages into trust companies, which could manage commercially viable plots of agricultural land, were stopped by President Mugabe, even after adoption by all 55-district councils. Mugabe feared anything that allowed rural communities an effective degree of autonomy, particularly financial, as this might reduce his ability to play patronage politics (Meredith, 2002).

The Beginning of Land Reform

By 1990, the black elite, [e.g., ministers, MPs (Members of Parliament), senior civil servants, police and defense officials, etc.] had acquired 8% of commercial farmland, though little was put into production (Meredith, 2002). This takeover of land by the black elite significantly increased in the 1990s and appears to be part of the agenda for Zimbabwean land reform in the 21st century.

Even though land reform from the early 1980s to the mid-1990s did not take place to the advantage of the rural poor, legislation was in place that completely reformed the constitutional constraints under the Lancaster House Agreement. The Land Acquisition Act of 1992 was enacted to speed up the land reform process, empowering the president and other authorities to compulsorily acquire land: 1) paying in local currency, 2) acquiring fully utilized land and 3) not requiring a willing seller-willing buyer principle.

The State already possessed vast quantities of land, once owned by white farmers, which it did not have the capacity to redistribute. As noted above, resettlement on the best land was delegitimised by cronyism, nepotism and corruption. The government controlled 80% of the land in Zimbabwe including 55% of the most productive farmland and had yet to use productively the majority of the 4 million ha purchased from commercial farmers since 1980 using foreign funds donated for this purpose (Ngwenya, 2001 *In:* Bond & Manyanya, 2003). Of this land in 1997, 12.8% was in protected areas climbing to 14.2% by 2004 (UNEP-WCMC, 2004).

Opposition by white landowners increased throughout the period of 1992-1997. This resulted in Britain withdrawing aid to the land reform program, as it had accused President Mugabe of giving purchased land to his “cronies” (New

African, 2000; Godwin, 2003). Whitehall now claims to have contributed ≈US\$ 70.4 million (£44 million), but Timothy Stamp, Zimbabwe's former (white) finance minister claims it was actually ≈US\$ 27.2 million (£17 million) (New African, 2000). It is claimed that land reform at independence in Kenya was similar. While the Government bought some land from departing Britons and divided it among Kenyan farmers, most of the farms were bought by wealthy Kenyans and politicians (Rosenblum & Williamson, 1987). Parker (2007a) disputes this explaining that

“While some (a few) white owned farms went to black politicians, by far the greater majority did go to small-holders. The country has over 4 million title deed holders and the buy out of white farms is far more a story of considerable success than failure”.

In November 1997, President Mugabe, due to campaign promises, designated up to 5 million ha (13.7 million acres) of farmlands for the resettlement of 100,000 families (The Chronicle, 1997), which amounted to 1,503 white owned farms.⁷⁰ This was estimated to be 45% of the total land held by Zimbabwe's “white” commercial farmers (Meredith, 2002). Initial estimates by the Commercial Farmers Union were that farm worker employment would drop from 327,000 to 180,000 on large scale commercial farms, if the earmarked farms were taken out of commercial production (The Herald, 1997). The majority of these farms were highly productive growing huge hectarages of wheat and maize, as well as high value foreign currency crops such as tobacco (Buckle, 2001). In fact, Zimbabwe's commercial farmers, if allowed to produce, could have fed Zimbabwe and many of the millions of people risking starvation in Angola, Lesotho, Malawi, Mozambique and Swaziland, due to regional conflicts and the drought. What was at risk was one of the “bread baskets” of southern Africa to feed the region, and

⁷⁰ GOZ (1997). This was published as a supplement in the local Zimbabwean newspapers on November 28, 1997 in “General Notice, LAND ACQUISITION ACT (Chapter 20:10), Preliminary Notice to Compulsorily Acquire Land”.

foreign exchange to drive the Zimbabwean economy. Landowners were given 30 days (as the 1992 Act demanded) to submit written objections (New African, 2000).

By September 1998, the Government called a donors conference in Harare on land reform (LRRP II); 48 countries and international organizations attended. The donors unanimously endorsed the land program, saying it was essential for poverty reduction, political stability and economic growth (New African, 2000). Twelve international donors agreed to help fund the purchase of 118 farms of 283,401 ha (700,000 acres) on a willing seller basis by white farmers, with a Technical Support Unit to assure transparency in the implementation of the program over a two-year period to assure that the land went to the poorest of the poor. Nothing happened and then in November 1998, President Mugabe announced the seizure of 841 white-owned farms (Meredith, 2002).

In 1999, the Commercial Farmers Union freely offered for sale to the Government 1.5 million ha for redistribution. As frustration set in on both sides, the Government drafted a new constitution with a clause to compulsorily acquire land for redistribution without paying compensation. The drafting stage of the constitution was largely boycotted by the opposition (supported by the landowners), claiming that Mugabe only wanted a new constitution to entrench himself politically (New African, 2000).

By the beginning of 2000, after 20 years of land reform, only 75,000 black families had been resettled on 3.6 million ha (9 million acres) of land, while whites, making up 1% of the population still owned 28% of all land and 60% of the best farmland on which crops were raised that accounted for 60% of Zimbabwe's exports. Meanwhile, since the early 1980s the black population had

increased by 60% (Godwin, 2003) to about 12 million compounding the problem of land compression, degradation and hence land hunger.

Radicalization of Land Reform

By February 2000, the Government organized a referendum on the new constitution. The country's powerful landed gentry (mostly white, who also controlled the economy) threw its weight and money behind the disparate opposition and human rights groups who formed a united front to fight against the new constitution. Calling themselves the Movement for Democratic Change (MDC), the united front won 55% of the votes as against the ruling Zimbabwe African National Union – Patriotic Front (ZANU-PF)'s 45% (New African, 2000) defeating the referendum; while gaining 57 to ZANU-PF's 62 seats plus 32 seats appointed by the executive in the June 2000 parliamentary elections (Human Rights Watch, 2002). The MDC had promised to purchase for resettlement six to seven million ha of underutilized, derelict and multiple owned land, land already identified and designated for the purpose and corruptly acquired land (Human Rights Watch, 2002). Two weeks after the February 2000 referendum, the land invasions began as the pro-Mugabe War Veterans Association organized people of like mind (not necessary war veterans as many of them were too young to have fought in the Liberation War) to march on white-owned farmlands (New African, 2000). Robert Mugabe excluded whites and their farm workers, mostly of Mozambican and Malawian extraction, from any legitimate place in the landscape (Beinart & McGregor, 2003). However, Sachikonye (2003) dispels this myth. He argues that until the 1960s, the bulk of farm workers were migrants imported from the neighboring countries of Mozambique, Malawi and Zambia since indigenous Zimbabweans shunned farm labor due to poor wages and working conditions. However, by 2000, indigenous Zimbabweans constituted about 75% of the labor force whilst migrants and their descendants made up the remainder. He estimates

a displacement of 200,000 out of 320,000 farm workers and their families totaling 1.8 to 2 million people, with less than 5% being granted land.

Since the land-expropriation campaign started in 2000, the government has seized more than 11 million ha of white-owned land (Thornycroft, 2004a). By 2003, only 200 of the 4,500 white-owned farms remained fully functional (Godwin, 2003). Under the fast track land reform program, model A1 is for 160,000 beneficiaries among the poor to decongest communal areas, with 20% of the resettlement plots reserved for war veterans, while model A2 makes land available with the goal of creating 51,000 small- to medium-scale black indigenous commercial farmers (Human Rights Watch, 2002). By mid-2003, 4.2 million ha (33 ha/household) had been allocated to 127,192 households under the A1 scheme and 1,672 farms totaling 2.1 million ha (276 ha/applicant) had been allocated to 7,620 applicants under the A2 scheme (IRIN, 2004). By 2007, the government estimated redistribution of land to over 150,000 A1 farmers and to 14,000 A2 farmers (All Africa, 2007). Due to a lack of expertise, capital and the cost of inputs, many of the A2 farms lay idle (IRIN, 2004). An estimated 90% of the 300,000 Zimbabweans who were given land by the government under the current land reform program still lacked farm inputs and some 94% did not have seeds for the upcoming season (Clover, 2003). The situation was further aggravated by the uncertainty of tenure, as it appeared that the government still owned the land, making it difficult for farmers to access credit from financial institutions (Roman, 2003). By the end of 2002, Zimbabwe's average farming output was down by about 75% from the previous year (Roman, 2003).

In June 2004, Zimbabwe announced that land would no longer be privately owned, while 99 year leases would be given out to land occupiers (Thornycroft, 2004a). Security of tenure is an issue affecting investment and production (IRIN, 2004) with only 546 out of a target of 8,000 A2 farmers being given 99 year

leases, while A1 resettled farmers will be given permits (All Africa, 2007) to “provide better security to new settlers and instill a sense of ownership and commitment to the land and natural resources” (MET, 2004). Much of the best land has ended in the hands of ZANU-PF leaders and Government officials, military officers and many leading judges (Human Rights Watch, 2002; Thornycroft, 2004a). Godwin (2003) saw tenure as a similar issue, believing many of the title deeds to have been retained by commercial farmers. This has resulted in many farmers reverting to subsistence practices (Godwin, 2003). In 2006, Zimbabwe still cannot afford to import inputs, especially nitrogen fertilizer, while 90% of the land taken from white farmers 6 years ago lay fallow, the new farmers lacking technical support and finances (Thornycroft, 2006a). By the 2006/07 season the total area under maize was 1.2 million ha, or 200,000 ha less than the previous season. This is due to drought and extensive crop failure in the south of the country, and less planted on A2 farms (averaging 80-200 ha/farm). Many A2 farms, with the most productive soils in the country, remain in fallow since “farmers” lack experience, an unwillingness to invest in agriculture under conditions of hyperinflation, costs of inputs (fertilizers and diesel), limited machinery, and experienced farm managers leaving for higher wages in other sectors (USDA, 2007). The devastating toll of HIV/AIDS, with 25% of the population ages 15-49 infected by 2003 (Goliber, 2004) is placing additional burdens on those available to continue with food production feeding those who are incapable of working, with the risk of developing a skewed population of young and old with few available workers.

Impacts of Land Reform on Wildlife and the Environment

While the Zimbabwean Government purports to support wildlife as a land use especially in Regions IV and V (MET, 2004), the reality on the ground indicates otherwise. Key wildlife habitat, forests, are being destroyed at an estimated

400,000 ha/year as people turn to wood for cooking throughout the country due to major power outages (Thornycroft, 2007a). The net result of the politicization of land reform in Zimbabwe has meant destruction of a model conservation program in which hunting grossed US\$ 22.3 million/year at its peak in 1998 (Khumalo, 2005) and ecotourism about US\$ 30 million/year (African Advisory Board, 2000). Originally, an estimated US\$ 15.9 million had gone to rural impoverished communities over an 11 year period of which an average of about 90% was derived from trophy hunting. However, this amounted to only about 7-10% of the annual gross turnover of which 49.7% went to communities or an average gross of US\$ 18.60/household/year for about 95,000 households. Because of the small amount per household, most community income was used for common property benefits (e.g., wells, schools, clinics). Some question whether limited benefits from such a narrowly focused use of resources can justify the maintenance of these vast natural areas without moving to a multiple resource use model. At the same time, conservation must fit into a bigger plan for the urbanization and industrialization of Zimbabwe and the subcontinent, if such land uses are to survive the first half of the 21st century. In addition to habitat degradation from farm invasions, a conservative estimate is a 50% loss in wildlife numbers, a 65% loss of tourism, and a loss of up to 90% of safari hunting on commercial farms (Herbst, 2002; Zimbabwe Independent, 2002) from poaching and habitat destruction. Unti (2007) estimates by 2007, an 80% decline in wildlife in conservancies and game ranches, and 60% in national parks. Zorn (2006) estimates no more than 20 of the 100+ game ranch operations remain. This is believed to be an error in the publication; “200 of 1,000+ game ranch operations remain” being correct. Heath (2006) estimates over 1,000 game ranches prior to the radical land reform, in 2006 reduced to about four functional conservancies of 120 properties, many invaded, plus an additional 60 game ranches scattered around the country. A 2005 constitutional amendment reverted ownership of all white-owned land to the State, but the State lacking the power of eviction without

lengthy court battles. In late 2006, a law was passed giving farmers 90 days to depart once given an eviction notice by the Mugabe Government, but without recourse to the courts (Thornycroft, 2006b). In April 2007, another 226 farmers were given eviction notices (All Africa, 2007) a portion of which would have been game ranches, leaving about 100 functional white farmers in the country – 98% of the white commercial farmers gone (Heath, 2007).

Linked to radical land reform, a collapse of food production and destruction of a once vibrant economy, is what appears to be sanctioned Government poaching in national parks. Although culling elephant in Zimbabwe's national parks as a means of habitat management is not new, Mugabe's ability to stay in power by assuring that his rural constituency is fed has resulted in "Operation Nyama (Meat)" resulting in elephant and other game being shot in national parks and along their borders to feed starving villagers, some accusing this as a front for illegal ivory poaching (Unti, 2007) to China in exchange for weapons. This is indicative of China's rapacious scramble for Africa's natural resources such as oil, minerals and timber. In the first half of 2006, 30 tons of ivory from Zimbabwe's Department of National Parks and Wildlife Management (DNPWM), representing tusks from 2,250 elephants were sold to China, some accusing Zimbabwe of mixing illegal with legally stockpiled ivory (Johnson, 2006) that amounts to 24,000 kg (Unti, 2007). This occurs through non-commercial trade under Convention on International Trade in Endangered Species (CITES) definition, in this case considered export of five items or less of a value of US\$ 500 or less. CITES export permits are issued by the Zimbabwean authorities for each shipment but are not recorded as commercial trade (Johnson, 2006) (see Chapter 10, Section 10.4.6.4, Zimbabwe). CITES, normally very vocal is quiet on this issue. In 2000, Zimbabwe had the world's largest single herd of CITES Appendix I black rhino, numbering about 500, but which was reduced to 200 from poaching by 2004 (Unti, 2007) and a further 80 from poaching in the first

three months of 2007 (VOA, 2007). In addition, trophy hunting is allegedly being allowed to take place within the world renowned Hwange and other national parks (Hammer, 2006). Ironically, Zimbabwe has just been elected to head the United Nation's Commission on Sustainable Development (CSD) that will be chaired by Zimbabwe's Environment Minister Francis Nhema (BBC, 2007a).

Land Reform and Food Shortages

Prior to 2000, extracting data from the USDA (2000), including the El Niño years of 1991 and 1994, total grain harvests of maize and wheat averaged 1.9 million tons/yr of which about 1.7 million tons/year was maize. WRI (2003) estimated total cereal production (maize, wheat, sorghum and millet) averaged 2.2 million tons (1,221 kg/ha/yr) from 1998 to 2001, a 4% decline from the 1979-81 seasons.

By 2002, Zimbabwe faced a severe food shortage projected for 6 million of its 13 million people caused by the farm disruptions coupled with drought. Stocks of maize meal, the staple diet of its 13 million people, had already run out (ZIC, 2002). By 2002, commercial wheat production was down 52% from the year before and the commercial cattle herd fell from 1.3 million head in 1999 to 200,000 by 2002 (Godwin, 2003). In December 2003, the World Food Program (WFP) was forced to cut food aid to 2.6 million Zimbabweans after donors came up with less than half (US\$ 161.3 million) of the US\$ 311 million requested funds to feed 6 million people in southern Africa through June 2004. Of the total amount of food aid, 67% was meant for more than 4 million Zimbabweans who would need assistance by January 2004 when the “lean season”⁷¹ begins with traditional grain shortages among rural households. People did not have the energy to cultivate crops for 2004, and few had the income to purchase staple

⁷¹ In the Sahel of Francophone Africa, this hungry season is called *soudure* beginning around June and ending sometime in the fall (e.g. October/November) at the next harvest (Rosenblum & Williamson, 1987).

food, with prices jumping 50% in the last weeks of December 2003 (Washington Times, 2003). Due to drought conditions and Zimbabwe's deteriorated economic situation, in 2005/06 "10 million people in the region needed food aid – 4 million in Zimbabwe, 4 million in Malawi, 1 million in Zambia, 500,000 in Lesotho, 400,000 in Mozambique, and 200,000 in Swaziland" (Rusere, 2005).

The 2006 season produced the worst ever yield of 700,000 tons of maize - Zimbabwe's staple crop - less than half the amount needed to feed the nation, despite more than adequate rains (Sithole, 2006; Thornycroft, 2006a), while 2007 has been declared a drought year with estimated harvests of 600,000 tons, 25% of the annual national requirement of 2.4 million tons (IRIN, 2007a; USDA, 2007). Extracting information from USDA (2007), maize yields since 2002 are at an all time low, about equal to those of the El Niño years of 1991 and 1994 at around 500-700 kg/ha/year compared to pre-land reform yields of 1,100-1,700 kg/ha/year. FAOSTAT (2007) data indicates an average maize production/yield of 1.7 million tons/1,290 kg/ha/yr from 1990-2000 versus 720,000 tons/543 kg/ha/yr from 2002-2005. The average yield for 2007 will be around 500 kg/ha below the average for the last five years. By the peak hungry (dry) season of December 2006 and January 2007, maize, sorghum and millet stocks for many rural households had run out, while the availability of maize meal in the market became erratic or beyond the purchasing power of the average family due to inflation. Although full statistics were not yet available, as of January 2007 it was determined that the 2006 winter wheat harvest was unlikely to surpass 135,000 tons, a 265,000 shortfall of the 400,000 ton demand until the next harvest (USAID, 2007). FAOSTAT (2007) data indicates average wheat production/yield of 243,000 tons/4,235 kg/ha/yr from 1990-2000 versus 161,000 tons/3,942 kg/ha/yr from 2002-2005. In 2007/08, only 8,000 ha of the projected 76,000 ha had been planted in wheat ahead of the May 31st deadline needed to assure a harvest (The Herald, 2007). Continuing into 2007, last year was the 6th year in a

row of failed crops in Zimbabwe in which 3 million people, 25% of Zimbabwe's population depended on UN food aid (Thornycroft, 2006a). Unfortunately, food aid has been used as a political tool, going preferentially to Mugabe's ZANU-PF supporters. A 2005 letter from a former Zimbabwean student at Tshwane University of Technology living in Chiredzi, southeastern Zimbabwe and a former school teacher summed up Zimbabwe's dilemma in just a few words, "we're starving to death" (Steyn, *pers comm.*).⁷²

In addition to Mugabe's policies helping to create famine by destroying one of the breadbaskets of southern Africa, his 2005 urban campaign, officially named Operation *Murambatsvina* that translates into "clean out the filth", in the majority Shona language is propagating famine. It has displaced 700,000 people from their homes and businesses in urban slums to rural areas (Thornycroft, 2005), where many of the people have neither the know-how nor the implements to farm and is not considering that the region is facing a major drought cycle. There is strong possibility that this incident will be referred to the International Criminal Court (ICC) in The Hague (BBC, 2007b).

Impacts of Land Reform on the Economy

The announcement of this nationalization of farms sent the economy into a tailspin from which it never recovered. The Zimbabwe dollar went from ZD\$ 10/US\$ officially in the mid-1990s to about ZD\$ 6,000/US\$ on the black market by November 2003. "Widespread food insecurity, massive unemployment and economic decline fuel the country's instability. Inflation reached a record high of 135% in the summer of 2002. Three-quarters (75%) of Zimbabweans are living in poverty, and up to half of the population was reported likely to need emergency

⁷² Simon Steyn, former school teacher from Chiredzi Communal area, and former Project Noah scholarship student, Dept. of Nature Conservation, Tshwane University of Technology (TUT).

food aid in 2002/03" (Africa Action, 2003). On August 2, 2005, the Zimbabwe dollar fell to an all time low against the U.S. dollar at ZD\$ 45,000/US\$ (Mutomba, 2005) on the parallel market and by the end of August to around ZD\$ 24,000/US\$ on the official market (Brown & Muleya, 2005). By early 2006 this amounted to ZD\$ 80,000/US\$ on the black market and 26,000/US\$ on the official market (Zorn, 2006). According to the BBC (2007c), in March 2007 the Central Bank's official exchange rate was ZD\$ 250/US\$, and ZD\$ 15,000 for some exporters, international organizations, gold miners, tobacco farmers and remittances from expatriates, while on the black market the rate was ZD\$ 25,000/US\$. Meanwhile inflation had soared to 2,200% by March 2007 (BBC, 2007; Zim Observer, 2007) amounting to an increase in prices of 50.5% (Zulu, 2007), 3,714% by April with prices increasing by 100.7% since March (Zulu, 2007). The IMF projects inflation could climb as high as 5,000% (Thornycroft, 2007b) and Zimbabwe's Labor and Economic Development Research Institute predicts inflation to 10,000% by early 2008 (Zulu, 2007). Hyperinflation is defined as growth in inflation of over 50% month on month (Thornycroft, 2007b). Interest rates on loans were at 500% (Zim Observer, 2007). By December 2006 a loaf of bread cost ZD\$ 800 (USAID, 2007), in reality ZD\$ 800,000 as the government issued new notes in August 2006, slashing three zeros off the currency (Thornycroft, 2006c) and "well beyond the reach of poor households for whom bread traditionally constituted a significant part of their diet" USAID (2007). In May 2007, a small bag of essential goods from the supermarket cost nearly one million Zimbabwe dollars, or US\$ 33 on the black market, and US\$ 4,000 at the official rate of exchange (Thornycroft, 2007b). Making it virtually unaffordable to the average consumer, by May 2007, the official retail price of a 5 kg bag of maize meal soared from ZD\$ 3,200 (US\$ 0.12) to ZD\$ 21,874 (US\$ 0.87), an increase of 583% due to the monopolized Grain Marketing Board increasing payments to farmers as a means of stimulating maize production to achieve national food security. For a family of six with a monthly salary of

between ZD\$ 200,000 (US\$ 8) and ZD\$ 500,000 (US\$ 20), a 20 kg bag of maize meal/month will now cost ZD\$ 78,988.57 (US\$ 3.15), or 16-39% of their salary instead of the previous cost of ZD\$ 11,800 (US\$ 0.47), or 2-6% of their salary (IRIN, 2007a). For the 80% unemployed (IRIN, 2007b; U.K., 2007) this implies malnourishment and living off the land to survive, including the country's wildlife (Unti, 2007).

In addition, Zimbabwe will produce only 50 million kg of tobacco in 2006, where 6 years ago it produced nearly 5 times that amount, earning 40% of the total foreign exchange (Thornycroft, 2006a), at that time the second largest tobacco producer in the world after Brazil (Machipisa, 2000).

Ultimately, Zimbabwe's politicization of land reform failed to address the needs of both the rural and urban poor majority, simply replacing a tiny white elite with an equally small black one.

Impact of Land Reform on Regional Economies

This has had major impacts on regional economies, especially South Africa's. While the G8 committed US\$ 6 billion to development assistance in Africa, South Africa alone lost US \$7.7 billion because of Zimbabwe's economic breakdown (ZIMNEWS, 2002) between the beginning of radical land reform and 2002. Between 2000 and 2003, Zimbabwe's crisis cost the region about US\$ 2.5 billion in investments, and shaved around 1.3% off South Africa's Gross Domestic Product (IRIN, 2006). By the end of 2002, an estimated US\$ 8.9 million was owed to Telkom, South Africa's telecommunications utility; US\$ 11.9 million to ESKOM, the state electricity supplier; US\$ 11.2 million to the Reserve Bank; \$8.2 million to Transnet, the state-run transport company; more than US\$ 11.2

million to the fuel sector, and about US\$ 17.9 million to other companies (IRIN, 2006).

While 500 to 1,000 illegal Zimbabwean immigrants are arrested per week trying to cross the 272 km border, another 10,000/week successfully make it into South Africa (Chibaya, 2006). An estimated 2.5 – 3 million Zimbabweans are living in South Africa, the majority unskilled migrants willing to work for US\$ 5/day or less, negatively impacting the job market for South Africans. Even Zimbabwean professionals such as teachers are employed for as little as US\$ 90/month below the stipulated minimum of US\$ 300/month. Many professionals, who do not find jobs, beg or work as unskilled laborers such as waiters (IRIN, 2006) or security guards. This is putting pressure on South Africa's 27% (official) to 40% (outside analysts) unemployment, adding to the xenophobia that accuses migrants of increasing crime, stealing local jobs, houses, women and children's places in schools (IRIN, 2006) and placing further strain on South Africa's overburdened infrastructure. In neighboring Botswana, daily an estimated 1,000 Zimbabweans cross the border post of Ramokgwebana, the majority looking for work (IRIN, 2007b), with the likelihood that those crossing illegally are many times greater in number.

Conclusions

At the July 2004 summit of the African Union in Addis Ababa, a report was circulated on Zimbabwe produced by the African Union's Commission on Human and Peoples Rights. "It described Zimbabwe as a deeply-divided society, suffering from police abuses, a compromised judicial system, and a stifled media...the report confirmed what many Zimbabwean rights activists had long said, that the abuses had nothing to do with race or land reform or black empowerment" (Thornycroft, 2004b). This implies that what has happened is

linked to a struggle between various factions for political power. Unfortunately, the AU has put off dealing with this issue for at least another year (Majtenyi, 2004b).

The reality of the matter is that regardless of whether land reform is undertaken properly or not, care must be taken that within one generation these farms do not become subdivided into uneconomical units that result in further mining of the soils, as is occurring across the Continent, resulting in renewed land hunger. This will require establishing legal limits on minimal farm sizes to assure economically viable units. Some claim that such limits on minimal farm size exist based upon the productivity in the agro-ecological zones. They also claim that the “master farmer training program” in existence since the Ian Smith era and “farmer field schools” (Heinrich, 2004; CGIAR. 2006) can continue to provide a nucleus of small-scale commercial farmers who can bring back Zimbabwe’s food production if given credit to purchase inputs. One can only hope that this comes to fruition. It also implies that if ecological/economic minimal land sizes per farm are respected, the ratio of the available number of farms, to population that grew 4.3x from 2.9 to 12.2 million between 1950 and 2000 (USBC, 2004) and is expected to increase to 14.6 million in 50 years (Goliber, 2004), is likely to be so small that the future for the majority of sons and daughters of today’s small and medium farmers in Zimbabwe will be in off-farm pursuits.

Furthermore, the current climate created in Zimbabwe has negated that country’s contribution to the global conservation effort with the immediate extinction of wildlife a reality and that followed by an ecological disaster as millions of people scratch a living off the land. What has happened in Zimbabwe should be a wake-up call to Southern Africans, especially South Africa. While the authors recognize the injustices of colonialism, two wrongs do not make a right. If land reform in Namibia and South Africa take similar paths, not only could it mean an

ecological catastrophe, but destruction of the agro-industrial complex critical to fueling the subcontinent's economic engine, South Africa. South Africa is the "life raft" that can help save the rest of the subcontinent. However, poorly thought out internal and regional policies that result in economic ruin and uncontrollable immigration by the poor, hopeless disenfranchised masses could end any hope for an "African Renaissance", and end any hope for Africa's people to benefit from the technological solutions to development that this country may offer.

5.7.4.2 Land reform and South Africa

Zimbabwe's next door neighbor, South Africa has similar land inequities (see Section 5.6.1.7, Impacts of colonialism on traditional agriculture in South Africa). However, South Africa appears to be undertaking land reform in a methodical manner in order to avoid disrupting the economy and food production (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003). So far the South African government has stayed firmly within the constitutional framework on land issues, thereby respecting property rights. By December 2004, about 70% of some 80,000 land restitution claims had been quietly settled and 812,315 ha of land had been transferred amounting to less than 1% of the commercial land. There are 9,000 rural claims involving millions of people that are still outstanding. "By December 2004, total land delivered under land reform amounted to 3.5 million ha (i.e., land delivered under the redistribution, restitution and tenure reform programs, and including state land)" (Bernstein, 2005). Land claims had been reduced down to 7,000 by early 2006 (Sapa-AFP, 2006).

It is important to note that South Africa is the last country in Africa that can feed itself and in normal years provides a surplus to feed much of Southern Africa. With Zimbabwe, the other surplus food producer out of action, it becomes critical

that land reform take into account the need to maintain current levels of commercial agricultural production. Many would argue that land reform is too slow and that there is not an adequate plan to train black South Africans in commercial farming to the point that they can run these farms on their own. Such a plan would assure that properly trained individuals/groups are given these commercial farms to run as opposed to non-farmers. South Africa's original goal of redistributing 30% of the white-owned land to landless blacks by 1999 has not been achieved, with estimations running from less than 5% (Godwin, 2003) to less than 2% (Bond, 2002) having been redistributed, and the target date having been moved to 2015 (Godwin, 2003). In early 2006, it was announced that "willing seller willing buyer" would no longer apply to land restitution cases. The government is willing to pay, but not at what it considers inflated prices (Sapa-AFP, 2006). The draft AgriBEE (2004) released in July 2004 sets goals of:

- 30% of agricultural land owned by black South Africans by 2014;
- 20% of high potential/unique agricultural land for lease by black South Africans by 2014;
- 15% of high potential/unique agricultural land for acquisition by 2010; and
- 10% of agricultural land available to farm workers for animals and plant production.

Achieving this target will not be easy. By December 2004 only 4.3% of commercial agricultural land (3.5 million ha mentioned above) had been transferred to blacks; 3.4% discounting transferred state land (Bernstein, 2005). In July 2005 "at a national land summit in Johannesburg, Deputy President Phumzile Mlambo-Ngcuka said the current market-based approach was not working", where the whites, making up 10% of the population, control 80% of the agricultural land (BBC, 2005). South Africa must approach land reform cautiously as the current agro-industrial complex employs hundreds of thousands

of farm and factory workers (see Chapter 12, Section 12.2.4.2, Agricultural subsidies) and South Africa is the last country on the subcontinent that can feed itself. Taking the wrong path could see land handed over to people who are incapable of commercially farming this land, the collapse of a once viable agro-industrial complex that is a net exporter of food, grocery shelves, as on most of the subcontinent, with a sparse variety of goods often of poor quality and urban centers that will be fed by handouts from the West turning South Africa into another puppet state. The protection of the South African farmer from subsidized food emanating from the West will be critical if this important sector is to continue playing an important role nutritionally and economically in the region (see Chapter 12, Section 12.2.4.2, Agricultural subsidies).

The record to date of commercial farms being turned over to rural communities in South Africa has been abysmal, because of a lack of skills, capital, and inadequate extension services (DuToit, 2004). The realization of the goals set out in the Agricultural Black Economic Empowerment (AgriBEE) document needs to be undertaken in a partnership between government and the private sector so as to assure an orderly transition, while maintaining food production for the region (National Department of Agriculture, 2003). Realizing that the key to moving black South Africans into commercial agriculture is education, the following goals have been set, including the introduction of mentoring programs [implying the establishment of relationships between white commercial farmers as mentors to small-scale/small black commercial farmers and aspiring black farmers (e.g., young black university/agricultural college graduates)] (AgriBEE, 2004) (see Section 5.12.6.1, South Africa, an emerging model in public private partnerships):

- 75% literacy rate within farming communities by 2008;
- Complete literacy by 2010 within farming communities;

- All workers in secondary and tertiary sectors of agriculture literate by 2010;
- Training programs for farm and enterprise workers in appropriate technical and management skills by 2005 including use of private sector agro-industries in-house capabilities for training; and
- Young professionals' employment and mentoring program targeting 5,000 unemployed and underemployed graduates/year over the next five years starting in 2005.

According to Bernstein (2005), additional targets set by AgriBEE include:

- 30% representation of black people in executive management by 2006 in the agricultural sector;
- 50% representation of black people in senior management by 2008;
- 60% representation of black people in middle management by 2008;
- 10% representation of black women in executive management by 2006;
- 25% representation of black women in senior management by 2008;
- 30% representation of black women in middle management by 2008;
- 45% representation of black women in junior management by 2008; and
- Source 50% of all procurements from BEE companies by 2010 and 70% by 2014.

While all of this is laudable, one must realize that farming is not all that it is cracked up to be. It is hard work, long hours and very competitive. Due to globalization, elimination of farm subsidies and resulting increases in costs, farming has gone from 23% of the GDP in 1920 to 3.4% in 2002 (Bernstein, 2005) to 4% (OECD, 2006), as the number of white commercial farmers has contracted over the last 15 years from 78,000 to 45,000 (Bernstein, 2005).

However, the value of farming to the overall economy, considering linkages to other sectors such as agro-industry could be as high as 20-30% of the GDP, employing 10% of the work force or 814,000 people (Nieuwoudt & Groenewald, 2003; OECD, 2006) and 33% of total production exported (OECD, 2006). Thus, land reform must be undertaken with great caution so as to maintain the economic viability of the agricultural sector, without which the country could be thrown into an economic tailspin.

Furthermore, the Center For Development Enterprise in South Africa believes that too much emphasis is being placed on rural land reform, while South Africa has evolved into an urban/peri-urban society (60% urbanized by 2005, 70% before 2014) with an increasing need for urban land redistribution where the majority of the populace lives and is in need of basic infrastructure and shelter. It is also recognized that while people have socio-political ties to the land of their ancestors as in Zimbabwe, this does not necessarily equate with the desire to farm (Bernstein, 2005).

There is a general tendency that once a person becomes urbanized, it is rare that they will return to rural areas of their own volition during the productive portion of the lives, other than for short-term interventions such as planting/harvesting, unless out of desperation, “politics of despair” (see Chapter 9, Section 9.6.1.2, Kifluku Farm, Laikipia, Kenya, Section 9.7.8, Lack Of Adequate Alternative Livelihoods, Section 9.7.8.1, Politics of despair, Zambia and Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem” and Section 9.7.8.3, Need for non-rural livelihood alternatives through industrialization). Those children raised in an urban environment will likely never become farmers, nor will they have a desire to farm. “Based upon national surveys, only 9% of black people who are currently not farmers have clear farming aspirations. Other surveys suggest that only about 15% of farm workers have aspirations to farm on

their own, or to farm full-time" (Bernstein, 2005) with rural land being a priority issue for only 2% of those surveyed versus unemployment (57%) and urban land/housing (35%) (Bernstein, 2005).

The private sector is playing an important role in rural transformation. Programs are underway by Cotton SA to increase production and the numbers of the currently 3,000 small-scale farmers (Louw, *pers. comm.*).

"...the sugar industry has created almost 48,000 small (mainly black) farmers over the past three decades. In 2004, the South African Sugar Association set up the Inkezo Land Company, a section 21 company which aims to transfer 78,000 ha of land to emergent growers by 2014...The timber industry has established outgrower arrangements with more than 10,000 emerging producers...South African Breweries has promised some 180 emergent farmers in the Taung area, near Kimberley, that it will buy their crop, thus providing security for the farmers..." (Bernstein, 2005),

while similar initiatives are being undertaken by the Land for Peace Initiative, the Red Meat Producers Organization, the Grain Producers Organization, Boeresake, The Coastal Farmers Cooperative in KwaZulu Natal, MKTV-Tobacco, SOK and Senwes, The Northern Cape Agricultural Union and the North West Agricultural Union, etc. (Bernstein, 2005). Further discussion in transformation is contained in Section 5.12.6.1, South Africa, an emerging model in public private partnerships on mentoring.

It is believed that deracialization of commercial agricultural land "will not benefit primarily poor black South Africans; the benefits will mainly accrue to a small number of relatively better-off black land owners and potential farmers" (Bernstein, 2005). In fact,

“...President Thabo Mbeki are among many South Africans who have become increasingly critical of black empowerment deals over recent years, charging that the same small group of individuals benefit over and over again. They say this has resulted in a small super-rich black elite, and add that the deals rarely benefit the poor” (Robertson, 2005). In South Africa, some call these elite “black diamonds”.

The feeling is that land reform must be brought up to date with much more of an emphasis on urban issues (Bernstein, 2005).

“Rural land reform (alone – See Chapter 9 discussing the concept of resource/population ratios in rural Africa) is not the answer to rural poverty. South Africa’s national development strategy needs to encompass a suite of programs to effectively lift millions of South Africans out of poverty (the majority living in urban areas). The keys here are quality education, employment, urbanization, and a new strategic vision of the role of the rural sector in economic development. South Africa has never had a rural development strategy; it is time we developed and implemented one that is relevant to Africa’s most urbanized and industrial economy...if land issues are not successfully handled, they have the potential to destabilize the country politically, and derail other national development goals and priorities” (Bernstein, 2005).

The announcement by President Mbeki in his State of the Nation address to Parliament indicated the “state would review the ‘willing buyer, willing seller policy’ as well as ‘land acquisition models and possible manipulation of land prices,’ ” the feeling being the current situation is counter productive to achieving the 2014 goal (Sapa-AFP, 2006). The process in which this is implemented could determine the future of food sovereignty, the economy and Foreign Direct Investment (FDI). The future in how land reform is undertaken may also be critical to the future of the hunting and game ranching industry in South Africa. The majority of game ranches are owned by wealthy urbanites who do not depend on these farms for a livelihood, often serving as weekend retreats, and often not operated to make a profit. Even though many of these farms are on land that is

marginal for agriculture, how the land reform process views these areas (e.g., under-utilized), as in Zimbabwe, could have a major impact on the long-term viability of this industry.

In addition, the South Africa's safari industry composed of game ranchers, safari operators and professional hunters is 99% white. Provincial nature conservation authorities have increased the number of black (previously disadvantaged) staff, their biggest challenge being to find qualified personnel, though this should improve over the next decade as more black South Africans have access to a university education. Realizing, the safari industry could be in jeopardy if seen purely as a "white man's game," the Professional Hunters Association of South Africa (PHASA) raised US\$ 98,000 (R680,000) on May 2007 towards bursaries for black students to the South African Wildlife College (SAWC) (ASG, 2007). Though laudable, this would seem to be directing students towards being trained to work in provincial nature conservation authorities as opposed to going to professional hunting schools, the road to becoming a safari operator. If the professional hunting/safari operator and game ranching industry remains lily white, while the only opportunities for blacks are in government, there is a strong risk, game ranching in South Africa could go the way of Zimbabwe; taken over by black communities that convert it to other land uses, as they see little or no value in maintaining natural systems and game. The Professional Hunters Association of South Africa (PHASA) and the game ranching industry must throw their doors open to black South Africans, acting as mentors (see, Namibian professional hunting model, Chapter 9, Section 9.7.5.6, LIFE, Namibia, Nyae Nyae Conservancy.

5.7.4.3 Land reform around the corner in Namibia

Although slow, to date, Namibia has had open dialogue between various stakeholders through the Land Reform Advisory Commission including: 1) white Namibians comprising about 5-8% of the Namibia's population of +/- 2 million, who own about 95% of the farms consisting of 4,000 commercial mostly white ranches 2) 240,000 blacks awaiting resettlement and 3) the government, with land being given over supposedly on a willing buyer, willing seller basis (Shiner, 2004; Thibodeaux, 2005). Today, between 50-80% of Namibia's farmable land belongs to white farmers, while black farmers own about 16%, mostly in over-grazed communal areas (Shiner, 2004; Thibodeaux, 2005). In the early 1900s between 60,000 (Hochschild, 1998) and 80,000 black people lost their lives to German colonization (Shiner, 2004) and the confiscation of their land.

The black Namibian Farmworkers Union has threatened Zimbabwe-like land invasions because of a land reform process being allegedly slowed by commercial farmers. This includes unreasonably high prices being asked for white farms and only the poorer lands being made available for purchase by black farmers/government. Because of this, the Ministry of Lands is embarking on expropriations, bringing about concern of a Zimbabwe-like fast track program (Shiner, 2004). In 2004, Namibia announced an ambitious campaign to acquire land earmarking about US\$ 170 million, less than US\$ 20/ha, well below market value, to buy about 9 million ha of white-owned farms and ranches by 2010. The strategy consists of expropriating white-owned farms, in essence threatening to confiscate farms if their owners refuse to sell at prices set by government assessors. Namibia's land ministry sent out expropriation notices to about 17 white Namibian farmers, most of whom are reported to have had labor disputes with black Namibian farm workers (Thibodeaux, 2005). The predominantly white commercial farmers' Namibian Agricultural Union denies concern

explaining that the delay is about the selling of property that must be based not only on a fair price for the property but the loss of income over a certain period, thus making compensation equal to market value plus a percentage. “The pace of reform is expected to accelerate one way or another after presidential elections this year (2004). Hifikepunye Pohamba, the then Lands Minister and Southwest Africa People’s Organization (SWAPO)’s presidential candidate was expected to (Shiner, 2004) and did win.

In mid-2005, the first white-owned farm of 4,000 ha belonging to the Wiese family was sold to the Namibian government for resettlement. This farm was purchased by the family from the German government in 1903. According to the Wiese family, they were set up in a labor dispute staged by the farm workers to embolden the government to expropriate the farm. After a two-year battle with the lands ministry, they were coerced into the sale of their property for less than 50% of the asking price, US\$ 1.4 million (9 million Namibian dollars) versus US\$ 575,428 (3.7 million Namibian dollars) (SUNTIMES, 2005), after government threatened seizure of the property. Namibia’s “land reform policies, like nearby Zimbabwe's, look better on paper than in practice” (Thibodeaux, 2005).

Well known African ecologist, writer and policy advisor, Ian Parker feels that land reform in Southern Africa is inevitable (Parker, 2007b):

“When one plotted (human) population density against rainfall in all sub-Saharan countries, unsurprisingly, the highest densities were at the higher end of the (annual rainfall) rainfall distribution (except where it exceeded 2,000 mm p.a. (per year) when densities fell sharply - but this affected <3% of the total area). Two exceptions were Zim and SA (South Africa), where there were anomalous upward bulges below the 750 mm p.a. isohyet. They existed due to the segregated racial policies. On purely biological grounds I and Richard Bell predicted that such distributions could only be temporary and that in due course the bulges would redistribute themselves up the rainfall gradients. The biological

forces would undoubtedly be expressed as political policies that could take any of several options, but make no mistake, the inevitability of redistributed densities would be biologically driven. Politics were merely the expression in terms of human behavior. What Bell and I said was that the best option open to white Zimbos (Zimbabweans) given the inevitability of what would happen, was to initiate the process of redistribution themselves while they had the latitude to do so. If they resisted, the consequences for them would be the least pleasant. As I recall, Rowan Martin objected with intellectual elegance. However, history has proved us right in Zim and it will be RSA's turn next!"

One can only hope that land reform in South Africa and Namibia is undertaken in a constructive manner that improves the lives of the people and economies. Zimbabwe is certainly not the model to follow.

5.7.4.4 Land reform and civil war in the Ivory Coast

Although religion and ethnicity may also be playing a role, the current civil war in Ivory Coast is believed largely due to the migration of Muslim Burkinabé from an over-populated and degraded Burkina Faso/Sahel southward into a largely Christian Ivory Coast. "Between a third (33%) and a half (50%) of the country's population is now non-Ivorian, and the figure could be as high as 75% in Abidjan" (Kaplan, 1994). The civil war between the north and the south is as much about natural resources, which is access to the country's rich agricultural land. According to Pavy (*pers. comm.*), the civil war in the Ivory Coast is all about land that is now a scarce resource. As fallow periods decreased and soils began playing themselves out over the past 20-25 years, small-scale farmers began immigrating to the Ivory Coast from Sahelian countries such as Burkina Faso, Senegal and Mali, where human densities may be as high as 90 to 120 persons/ km². Many of the rebel fighters from northern Ivory Coast are traditional Dozo hunters/warriors, as described in Chapter 2, whose history dates back to the 1236 A.D. under the Mandingo Empire of Sundjata (Sundiata) Keita. Likewise,

because of the droughts of 1969-74 and 1980-84, Fulani herders have moved into the Ivory Coast. By cross-breeding with trypano-tolerant cattle (e.g., N'Dama and West African Short-horned [See Chapter 1, Section 1.1.4, Origins of Domestic Livestock and Pastoralism in Africa], through inoculations and skilled movement of their herds to avoid tsetse flies, their herds increased from 38,000 in 1966 to 255,000 by 1984, allowing Ivory Coast to meet 56% of its beef demand (Smith, 1992). Such increases in cattle numbers would also certainly have caused conflict between herders and small-scale farmers?

“One of the main sticking points of the stalled peace deal in Ivory Coast relates to changing nationality laws which would allow more immigrants to become landowners. The question divides both populations in the forested interior of the country and in the southern commercial capital, Abidjan. Over the past several decades, northern migrant farmers turned dense forestland in central and western Ivory Coast into profitable cocoa, coffee and palm oil plantations. But a 1998 law stipulated that only Ivorians can be landowners” (Colombant, 2004b).

Since 2004, village chiefs with the support of government security forces have started taking over land from “foreign farmers”, which they say is rightfully theirs. There never were any formal agreements on the immigrants’ exploitation of forest land and even though foreigners bought the land doesn’t mean that they own it, as usually there are no clear legally binding contracts. “The Ivorian peace deal calls for nationality requirements to be eased, allowing up to 3 million foreigners to become Ivorians - meaning they could also become landowners....Many Ivorians fear the change could spark more instability” (Colombant, 2004b). In some areas, chased out foreigners and immigrants are allowed to return if they start paying rent. This model is now being repeated elsewhere, but if naturalized Ivorians start laying claim to land, it could derail the fragile process. The power-sharing peace accord calls on parliament to swiftly change the nationality law. However, lawmakers from President Laurent Gbagbo’s party have so far managed to prevent it from being passed, fearing it

would mean a loss of economic power for indigenous Ivory Coast farmers (Colombant, 2004b). In October 2005, Ivory Coast's opposition bloc, known as the G7, threatened to withdraw its ministers from the country's unity government if President Laurent Gbagbo's did not step down at the expiration of his elected five-year mandate ending October 26. Gbagbo has the backing of a U.N. Security Council resolution supporting his continuing in office for a maximum of one year (Bavier, 2005). A fragile peace exists from the civil war that broke out five years ago that could go into remittance if the unity government collapses. In March 2007, a peace accord was signed between government and the New Forces rebel army, making former rebel leader Guillaume Soro the prime minister. Though the twice delayed presidential elections may occur by December 2007 (postponed until June/July 2008), there are concerns over issuance of national identity cards and transparency of such elections (Tran, 2007a; 2007b). In August 2007, disarmament of militias and integration of rebel forces into the Ivorian army had yet to take place. In early 2008, progress in ending the 5 year conflict remains stagnant, with a government run south and rebel held north. Periodic attempts at rebel integration and disarmament, as well as issuing identity documents to several million northerners have failed to reach fruition. National elections will likely be put off again.

5.7.5 Food Security and Urbanization in Sub-Saharan Africa

In the future, urbanization will pose the most dramatic challenges to food security. As rural areas become over-populated (see below), and limited opportunities exist to earn a viable living from the land, as more people receive Western education and as modern communications show what else there is besides a hoe, the youth of Africa are flocking out of the rural areas in search of a better life.

This is placing tremendous pressure on the most productive agricultural lands in the countryside, contributing to deforestation and desertification, as well as massive emigration towards major urban centers, producing “urban jungles” in growing “mega-cities”, which are ill-prepared for this onslaught – “the Lomé-Abidjan coastal corridor--indeed, the entire stretch of coast from Abidjan eastward to Lagos--is one burgeoning megalopolis that by any rational economic and geographical standard should constitute a single sovereignty, rather than the five (the Ivory Coast, Ghana, Togo, Benin, and Nigeria) into which it is currently divided” (Kaplan, 1994). Unfortunately, adequate urban infrastructure (water, sewage and housing, etc.), and job opportunities do not yet exist. This poses a major problem for African governments, to feed these urban masses, to find socio-economic solutions to poverty and crime and ultimately to assure political stability.

The proportion of Sub-Saharan Africa’s population living in cities has doubled from 15% in the 1960s to over 30% today and had the highest urbanization rate in the world of 4.3% in 1995 (Ruel, Garrett, Morris, Maxwell, Oshaug, Engle, Menon, Slack & Haddad, 1998 *In:* Swift & Hamilton, 2001 *In:* Devereux & Maxwell, 2001a). This urban migration has created mega-cities such as Lagos, Kinshasa, Brazzaville, Douala, Abidjan, Accra and Dakar in West and Central Africa; Nairobi, Kampala and Addis Ababa in East Africa, and the Pretoria/Johannesburg complex in South Africa. Yet the pull of many secondary cities such as Bouaké, Ibadan, Kaolack and Kumasi is also important. While there are signs that growth rates of 6% (4.3% above) will probably not continue, the trend towards continued swelling of the mega-cities and rising numbers of large secondary cities undoubtedly will. It is projected that that the number of cities in the region with more than 100,000 inhabitants will grow from 90 in 1990 to more than 300 in 2020. Increased urban densities will be the most pronounced, by a wide margin, in Nigeria, which will have more than half of these cities. Lagos

alone will have roughly 12-15 million inhabitants (IFAD, 2001). Some models predict that by 2020 that there will be one continuous coastal city between Lagos and Abidjan (*Pavy, pers. comm.*).

It is estimated that the urban population in Sub-Saharan Africa will overtake the rural population by 2020 with more than 50% living in urban settings. This will require that agricultural production and security strategies look beyond subsistence production in rural areas to supplying cheap, safe food to the cities (Ruel, *et al.*, 1998 *In: Swift & Hamilton, 2001 In: Devereux & Maxwell, 2001a*).

It is estimated that 40% of African urban dwellers farm to some degree (Ruel, *et al.*, 1998 *In: Swift & Hamilton, 2001 In: Devereux & Maxwell, 2001a*).

“Huge slum cities of Africa are growing apace, day by day, unplanned, and in ways which threaten serious social tensions in years to come...On present trends Africa will be, by 2030, an urban continent. Already 166 million people live in slums. Living conditions there are made worse by the lack of access to water, sewage, electricity, refuse collection or other municipal services by local authorities ill-equipped, or unwilling, to address them. In cities like Nairobi 60% of the people live on just 5% of the land. And these slums are filled with an increasingly youthful population, unemployed and disaffected. Africa’s cities are becoming a powder keg of potential instability and discontent” (Commission for Africa, 2005).

Who is going to feed these urban masses? This urbanization process has implications for policies relating to international trade, internal food marketing and subsidy programs (Devereux & Maxwell, 2001a). As the rural poor flee over-populated marginal areas which can no longer assure them a decent quality of life, they leave behind women, children and old people to do the farming, maybe returning for a couple of weeks/year to help cultivate. In Africa, often, too much research and extension is directed towards increasing land productivity (higher yields, improved fallow management) when labor is the real constraint (IFAD, 2001).

Ultimately, as the population in Sub-Saharan Africa, of which 44% is under the age of 15 (Pop. Ref. Bur., 2004), comes into the work force, they will live out their most productive years in economies ill prepared to provide them with opportunities. The effects of over-population, prolonged drought, inappropriate and unsustainable agricultural practices, failing economies, and sub-standard education and health-care systems have major political and social ramifications creating an atmosphere ripe for civil strife, and one of the largest refugee populations in the world. The combination of population, environmental degradation and politics has contributed to civil unrest and bloody conflicts blanketing the continent.

5.7.6 Weakness of Entrepreneurship and the Private Sector, Constraint to Food Production

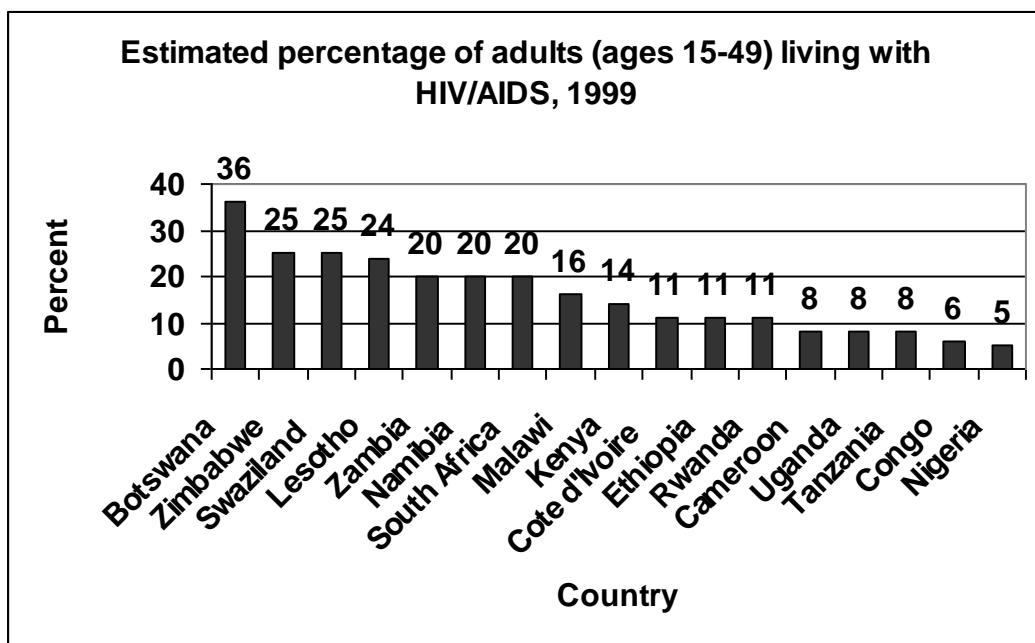
Many African countries have no local private sector to speak of in the agricultural and agro-industry sectors. While it is now fashionable to speak of the African “smallholder” as the region's true private sector, the reality gives cause for great concern. The African smallholder of today may be private but: 1) lacks education, 2) has severely limited access to communications or physical infrastructure, 3) suffers poor health and nutrition, 4) lacks remunerative markets and access to yield-enhancing inputs (e.g., fertilizers and pesticides) and technologies (e.g. genetically modified crops, tractors, latest irrigation technologies), and 5) faces competition with products from abroad that have been subsidized by more money than he/she can ever dream of (NEPAD, 2002).

“This farmer may constitute a ‘private sector’ but cannot stand alongside and compete with multinational farming and agro-industrial giants that trade with Africa. Whether labeled as private sector or otherwise, the smallholder farmer class also often suffers marginalization, with no voice to influence policy and to secure support services that are tailored to his needs. Africa cannot afford to be lured into complacency by references to a large smallholder

private sector. It needs to develop a true rural entrepreneurial capacity. Successful entrepreneurship requires fair prospects for competitive access to markets both at home and internationally and the information to enable the farmer to get the best from such markets, along with overcoming the above constraints" (NEPAD, 2002).

5.8 HIV/AIDS DECLINING AGRICULTURAL PRODUCTION AND FOOD SECURITY IN SUB-SAHARAN AFRICA

Each day 10,000 people are infected with HIV/AIDS in Sub-Saharan Africa, turning this from a health to a development problem integrally linked to the current food crisis (Figure 5.8) (IFPRI, 2000) (see Chapter 12, Section 12.6.1.1, Increase in poverty and decline in health from structural adjustment).



Note: Highest rates from other regions Haiti (5.2%), Bahamas (4.13%), Thailand (2.2%), USA (0.6%)

Source: IFAD, 2002, with permission, UN & International Fund for Agricultural Development of the United Nations (IFAD).

Figure 5.8: Estimated percentage of adults (15-49 years) living with HIV/AIDS, 1999

In Africa, 6,300 people/day die from HIV/AIDS. Of the 5 million new infections globally in 2003, about 3.2 million came from Africa and of the total of 40 million infected globally 26.6 million lived in Africa in 2003 (ICG, 2004a). It is estimated that of the 36 million people worldwide currently infected with HIV/AIDS, 95% live in the developing world, 70% (25.2 million) in Sub-Saharan Africa (IFPRI, 2000). Sub-Saharan Africa has already lost nearly 14 million to AIDS, and is projected to lose another 23 million by 2020. Similarly, the U.S. Department of Agriculture (USDA) estimated that Sub-Saharan Africa, with 11% of the global population, has an estimated 73% of global HIV/AIDS related infections (Shapouri & Rosen, 2001). It is estimated that nearly one in ten Africans infected with HIV/AIDS will die in 2004, or 2.5 million people, with a doubling of this figure expected by the end of the decade (ICG, 2004a).

The latest figures for HIV/AIDS in Africa are given in Table 5.11. The apparent declines do not indicate a decline in HIV/AIDS in Africa but in how the statistics were derived. HIV/AIDS is still on the rise in Africa (ICG, 2004a).

Table 5.11: HIV/AIDS infections in Africa (millions of people)

Figures for Africa in:	2002	2003
New Infections	3.5 million	3.2 million
Living with AIDS	29.4 million	26.6 million
Died of AIDS	2.4 million	2.3 million

Source: UNAIDS (2003) *In:* ICG (2004a), with permission International Crisis Group (ICG) & public domain.

“Food production, already lagging behind population growth in most countries in Sub-Saharan Africa, is now falling fast as the number of field workers shrinks. As food production falls, hunger intensifies among the dependent groups of children and elderly. Malnutrition weakens the immune systems of some, the virus weakens the immune systems of others, and some have immune

systems weakened by both. The downward spiral in family welfare typically begins when the first adult falls victim to the illness—a development that is doubly disruptive because for each person who is sick and unable to work, others must devote at least part of their time caring for that family member” (Brown, 2003a).

Households caring for an AIDS patient turn to a number of different coping strategies, most of which lead to less income and less food security. AIDS decreases income and agricultural production by removing from the labor force not only the sick person, but also other members of the household who must care for the patient (IFPRI, 2000; Roman, 2003).

Women, the mainstay in much of traditional Africa’s food production and food security at the household level are among the hardest hit with AIDS. It is estimated that women produce from 70% (Commission for Africa, 2005) to 80% of the staple food in Sub-Saharan Africa (Madeley, 2002) plus

“half of the animal husbandry in addition to food preparation, gathering firewood, fetching water, childcare and the care of the sick and the elderly. Women spend most of the earnings they control on household needs, particularly for the children, whilst men spend a significantly higher amount on themselves” (Commission for Africa, 2005).

Alemayehu (2000) estimates in Sub-Saharan Africa women contribute 60-80% of the field hands and 50% of the cattle tenders.

An estimated 7 million farmers have died from HIV/AIDS in Africa and these are mostly women, who make up 80% of the agricultural work force (Morris, 2004). Shapouri and Rosen (2001) estimate that 55% of all HIV infections in Sub-Saharan Africa are among women.

“In the 10 most affected African countries, labor force decreases ranging from 10-26% are anticipated. The UN estimated that 9.6% of Zimbabwe’s agricultural labor force was lost in 2000, Malawi losing 5.8%. What we are seeing in Southern Africa is that the food shortages are now exacerbating the downward spiral of health, both of those suffering from HIV/AIDS and children suffering malnourishment” (Roman, 2003).

Grandparents are often burdened with raising and feeding orphans. Food is believed to be the first line of defense against HIV/AIDS, prolonging the lives of infected parents enabling them to raise their children (Morris, 2004). Life expectancies are dropping and nearly 13 million children have been orphaned by the epidemic in Sub-Saharan Africa (IFAD, 2002).

Food insecurity caused by AIDS can extend beyond individual households. When a large enough number of people are ill or have died because of AIDS, food production for an entire region or country could be compromised. For instance in 1999, Ugandan farmers in the region around Kampala traditionally grew *matooke* (green banana) and supplied it to other regions of the country. Because of the loss of labor caused by AIDS related illnesses and deaths, the production of *matooke* has fallen, and this decrease in production has affected not only people growing *matooke* for their own uses, but also the availability of the crop for people in other parts of the country (IFPRI, 2000).

Loss of labor and income can also cause survivors to abandon agricultural practices that raise yields and protect soil fertility, like fallowing and use of fertilizers (IFPRI, 2000). Ultimately, HIV/AIDS means, “an ever smaller number of young adults (many of whom will be living with AIDS) will have to support large numbers of young and old people” (IFAD, 2002).

“The projected population decline from HIV/AIDS, coupled with a reduction in the number of agricultural laborers, will reduce labor productivity by 12%/year for the region (Sub-Saharan Africa).

Because of the decline in labor productivity, grain output fell 3.3% relative to the base-level projections, causing food gaps to grow. The region's food gap to maintain per capita consumption levels jumped 15%, while the nutrition gap rose an estimated 13%" (Shapouri & Rosen, 2001).

5.8.1 Linking HIV/AIDS to the Bushmeat Trade

Some of the most recent research seems to link HIV and the risk of similar viral infections to non-human primates and the bushmeat trade (BCTF, 2003; Wolfe, Switzer, Carr, Bhullar, Shanmugam, Tamoufe, Prosser, Torimiro, Wright, Mpoudi-Ngole, McCutchan, Birx, Folks, Burke & Heneine, 2004). Bushmeat constitutes 80% of all animal-based protein consumed in Central Africa, and represents as much as 50% of the daily protein intake for rural and urban families in that part of Sub-Saharan Africa. In the forest region, as the numbers of duikers decline (most commonly hunted antelope) from over-hunting (mostly by snaring) and habitat degradation, hunters shift to crossbows and poisoned arrows, or more expensive shotguns to harvest primates (BCTF, 2003) (see Chapter 2, Figure 2.3: *Arbalete* (crossbow), Baka Pygmies, Southeastern, Cameroon).

Hunting and butchering of wild non-human primates infected with Simian Immunodeficiency Virus (SIV) is thought to have sparked the HIV pandemic (Peterson, 2003; Wolfe, *et. al.*, 2004). HIV-2 and the sooty mangabey [*Cercocebus (torquatus) atys*] SIV are nearly indistinguishable, with distribution being the same from the West African Coast south from the Casamance River of Senegal to east of the Sassandraq River of the Ivory Coast (Côte d'Ivoire). However, the current HIV/AIDS global pandemic is 99% linked to HIV-I of which 99% of the infected people have HIV-1 group "M" linked to SIV in chimpanzees. Group "M" and HIV-1 groups "N" and "O", which appeared locally only, seem to have their foci in Central Africa (Cameroon, Gabon, Congo

Brazzaville and the western part of the DRC) and are all associated with the subspecies of chimpanzee (*Pan troglodytes troglodytes*) found in western Central Africa. The 30 SIVs and the two HIVs evolved out of non-human primate lentiviruses (*lentus* meaning slow – acting slowly). The common ancestral virus was introduced into primates hundreds of thousands of years ago. SIV is a misnomer because in primates there is no immunodeficiency, as the virus has lived in non-human primates for a long time. It is, however, virulent in humans where exposure is relatively recent (Peterson, 2003).

Bushmeat, as a major source of animal protein for much of Africa's rural poor and culturally preferred by the urban elite with rural roots, has the potential to be the source of more pandemic global outbreaks. Zoonotic infections with Simian Foamy Virus (SFV), a retrovirus endemic in most Old World primates, were identified in people living in Central African forests who reported direct contact with blood and body fluids of wild non-human primates. Contact with non-human primates, such as happens during hunting and butchering, can play a part in the emergence of human retroviruses (Wolfe, *et al.*, 2004). Ten of 1,099 individuals (1%) had antibodies to SFV. Sequence analysis from these individuals revealed three geographically-independent human SFV infections, each of which was acquired from a distinct non-human primate lineage: De Brazza's guenon (*Cercopithecus neglectus*), mandrill (*Mandrillus sphinx*), and gorilla (*Gorilla gorilla*), two of which (De Brazza's guenon and mandrill) are naturally infected with Simian Immunodeficiency Virus (SIV). This study indicates that simian retroviruses are actively crossing into human populations, and demonstrates that people in Central Africa are currently infected with SFV (Wolfe, *et al.*, 2004).

According to Peterson (2003), a 2002 study of 788 monkeys in Central Africa found that more than 20% of the blood samples tested positive for SIVs in 13 out of 16 primate species. This indicates that humans who hunt bushmeat are

exposed to a plethora of genetically highly divergent viruses, which can possibly jump to humans, thereby resulting in new epidemic outbreaks. Additional discussions on the bushmeat trade and its links to commercial logging concessions, as well as attempts to address this issue are contained in Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade and Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks And Protected Areas.

5.9 OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY

“World War III has already started, between Africa and its environment, and it will claim more causalities than the first two wars and the exterminated Jews combined”, (C. Payne Lucas past director of the NGO AFRICARE In: Rosenblum & William, 1990).

In 1990, about 76% of the world’s population lived in Less Developed Countries (LDCs) generating 19% of the world’s Gross Domestic Product (GDP), while 40% of the LDC population was 15 years or younger. The Developed Countries represented 16% of the world’s population and generated 69% of the world’s GDP. By 2025, it is estimated that the median age in developed countries will be 32, while in developing countries it will be 15 years of age. Some call the developed countries’ populations the “old millions” and the developing countries the “young billions” (Huntley, *et al.*, 1989).

Based upon United Nations (1999) statistics, Africa’s human populations increased 6.0-6.8 times (1.9-2.0% annual growth rate) between 1900 and 2000 from about 117-133 million to 767 million people (Table. 5.12). Even with HIV/AIDS, Africa’s populations are projected to increase 2.3-2.7 times by 2050 to from +-2.2 billion people, reaching 2 billion people or more by 2100. This will

place tremendous pressures on land for agricultural purposes, especially if the majority of the population lives in a subsistence mode.

More precisely, Sub-Saharan Africa's population increased 5.5-6.5 times from 95.9-114 million⁷³ to 622 million, a 1.9% annual growth rate between 1900 and 2000. Sub-Saharan Africa's human population is expected to increase from 622 million in the year 2000 to between 1,497-1,753 million by the year 2050 and to between 1,944-2,750 million by the year 2100. By 2050, this is an increase of 2.4-2.8 times (1.8-2.1% annual growth rate) over the year 2000 population and by the year 2100 an increase of 3.1-4.4 times over the year 2000 population (Table 5.12) (United Nations 2004). A country by country profile is provided in Table 5.13, depicting the tremendous increase in population by country between 1950 and 2000. FAO (2002a) estimates that by 2030 "Sub-Saharan Africa will still be growing at 2.1%. By 2030, every third person added to the world's population will be a Sub-Saharan African. By 2050, this will rise to every second person".

It is believed that European populations once grew as fast as Africa's, but were stabilized through massive emigration to the New World, Africa, Australia and New Zealand, as well as through education (Rosenblum & Williamson, 1987). Few Africans have the option of emigration off the continent, though there is a large internal migration from areas with depleted resources (e.g., Sahel) to areas that possibly offer a better life (e.g., urban centers, coastal countries, South Africa).

With high infant mortality rates and no social security, large families assure that enough infants survive adulthood to take care of their parents in old age. Since

⁷³ Latest data provided by Kees Klein Goldewijk (Kees.Klein.Goldewijk@mnp.nl) of the Netherlands Environmental Assessment Agency (MNP) now independent from the National Institute of Public Health and the Environment of the Netherlands at <http://www.mnp.nl/hyde>. for 1900 an estimated population of 140,596 million for Africa, and 114,263 million or an increase of 5.5 times for Sub-Saharan Africa.

60-70% of the labor force is involved in subsistence agriculture, traditionally in a rural setting large families meant free/cheap labor to weed the fields and tend the livestock. They cannot control the weather, but they can control the labor supply (Rosenblum & Williamson, 1987).

Table 5.12: Existing and projected human populations in Africa and Sub-Saharan Africa

Major Area Or Region	1900	1950	Times Increase 1900-1950	2000 Population Millions (4)	Times Increase 1900-2000	2050 Population Millions (Medium/High Scenario) (4)	Times Increase 2000-2050	2100 Population Millions (Medium/High Scenario) (4)	Times Increase 2000-2100
AFRICA	117.2(1) /133 (2)	221(2) /224 (1)	1.7-1.9	796 (1.9- 2.0%) Annual Growth Rate 1900- 2000)	6.0-6.8	1,803/2,122	2.3-2.7	2,254/3,235 (0.05-1.2% Annual Growth Rate 2050-2100)	2.8-4.1
Northern Africa				174		306/368		310/485	
SUB-SAHARAN AFRICA	95.9 (1)	179.9(1) /183.4 (3)	1.9	622 (1.9%) Annual Growth Rate 1900- 2000)	6.5	1,497/1,753 (1.8-2.1%) Annual Growth Rate 2000-2050)	2.4-2.8	1,944/2,750 (0.5-1.2%) Annual Growth Rate 2050-2100)	3.1-4.4
Eastern Africa				253		614/718		2,424.8	3.2-4.5
Middle Africa				93		266/309		2,93.3	3.8-5.3
Southern Africa				50		47/59		0.9-1.2	45/75
Western Africa				226		570/667		2.5-3.0	735/1,040

Sources: (1) NIPHE (2004), (2) United Nations (1999) with permission, (3) USBC (2004) with permission & public domain, (4) United Nations (2004) with permission. Prepared by principal author

Note: Percent Annual Population Growth Rate: (Years x r) = $[\ln(N_t) - \ln(N_0)] \times 100$, Where N = Population at Time "Zero" and Time "t," and "r" = Percent annual population growth rate

Table 5.13: Population increases Sub-Saharan Africa by country, 1950-2000

Country/Area	1950	2000	Times Increase
SUB-SAHARAN AFRICA	183,413,363	650,650,228	3.6
Angola	4,117,617	10,132,376	2.5
Benin	1,672,661	6,428,396	3.8
Botswana	430,413	1,607,069	3.7
Burkina Faso	4,376,162	12,217,363	2.8
Burundi	2,362,522	5,713,711	2.4
Cameroon	4,887,591	14,791,629	3.0
Cape Verde	146,403	401,343	2.7
Central African Republic	1,259,816	3,501,489	2.8
Chad	2,607,769	8,418,864	3.2
Comoros	148,057	578,400	3.9
Congo Brazzaville	767,838	2,809,476	3.7
Congo DRC (Kinshasa)	13,568,762	51,809,830	3.8
Cote d'Ivoire (Ivory Coast)	2,860,288	15,563,387	5.4
Djibouti	60,036	430,822	7.2
Equatorial Guinea	211,204	474,214	2.3
Eritrea	1,402,510	4,243,185	3.0
Ethiopia	20,174,562	64,690,052	3.2
Gabon	415,767	1,222,938	2.9
The Gambia	271,369	1,367,124	5.0
Ghana	5,297,454	19,509,240	3.7
Guinea-Conakry	2,585,509	8,641,965	3.7
Guinea-Bissau	573,268	1,278,259	3.3
Kenya	6,121,184	29,985,839	4.9
Lesotho	726,182	1,846,827	2.5

Source: USBC (2004) with permission, U.S Bureau of the Census (USBC) + public domain.

Prepared by principal author

Table 5.13 (Cont): Population increases Sub-Saharan Africa by country, 1950-2000

Country/Area	1950	2000	Times Increase
Liberia	823,885	3,148,999	3.8
Madagascar	4,620,437	15,506,472	3.6
Malawi	2,816,600	10,873,591	3.9
Mali	3,687,654	10,665,383	2.9
Mauritania	1,005,595	2,667,859	2.7
Mauritius	481,270	1,179,368	2.5
Mayotte	21,597	155,911	7.2
Mozambique	6,250,443	17,768,457	2.8
Namibia	463,729	1,905,659	4.1
Niger	2,481,525	10,173,661	4.1
Nigeria	31,796,939	114,311,328	3.6
Reunion	243,700	720,934	3.0
Rwanda	2,439,435	7,507,056	3.1
Sao Tome and Principe	59,730	159,883	2.7
Senegal	2,653,637	9,784,325	3.7
Sierra Leone	2,087,055	5,202,659	3.5
Somalia	2,437,932	7,253,137	3.0
South Africa	13,595,840	44,066,197	3.2
Swaziland	277,384	1,120,183	4.0
Tanzania	7,934,924	33,065,142	4.2
Togo	1,171,897	5,032,783	4.3
Uganda	5,521,758	23,248,553	4.2
Zambia	2,553,000	10,116,606	4.0
Zimbabwe	2,853,151	12,185,932	4.3

Source: USBC (2004) with permission, USBC + public domain.

Prepared by principal author

Rural America was no different as late as the 1920s before the “Great Depression” and the massive rural urban exodus that changed the face of the continent. The principal author’s 93 year old mother grew up in rural America with 11 brothers and sisters. The girls helped their mother in the vegetable garden and in canning during the summer around a coal stove in order to have food for the winter, as there was no refrigeration, only a cellar to keep things cool. The boys helped their father in the orchards. The large farm family in pre-WWII America and today’s Sub-Saharan Africa was/is an economically productive unit

of inexpensive labor, room and board. However, as in Sub-Saharan Africa, America was running out of farm land. After reaching adulthood, only one brother was able to farm full time; two farmed part time – one working in a factory at night and the other delivering mail in the morning; while the remaining eight had/wanted to leave for the towns and cities to earn a living.

The principal author's mother explains that in her opinion what transformed America was rural electrification (improved infrastructure) and a massive educational program after WWII through the "GI Bill" that sent many farm boys off to university. America was urbanizing and industrializing in a manner that absorbed these youth off the farm, took pressure off the land and helped create the current setting of a majority educated middleclass and their associated characteristics (e.g., significantly smaller families, healthy and well educated children, the development of an environmental consciousness). The principal author has over 30 first cousins, of which only one works in farming. If tomorrow, Americans were forced back onto the land to live subsistence lifestyles as they did in the first half of the 20th century, the USA would experience similar land hunger and associated environmental degradation. People would likely fall back onto the extended family for survival, and the consequences of these relationships that keep most Africans in a perpetual state of poverty (see Chapter 11, Section 11.6.3.3, Corruption and the extended family). The entire subcontinent is in a trap that at times seems inescapable.

Education, linked to the introduction of appropriate technologies in both rural and urban settings may be the only hope for Sub-Saharan Africa to get a grip on this population explosion and to develop the continent. Conservation and agriculture, to be successful, must fit into a big picture plan for Sub-Saharan Africa, and must be linked to adoption of modern agricultural technologies integrated into traditional knowledge, along with urbanization that is tied to diversification and

based upon transforming Africa's raw products, agricultural and other, on the continent. There should also be a leap into the information technology age. This is discussed more in Section 5.12, THE WAY FORWARD and forthcoming chapters. Ultimately, as the subcontinent becomes more educated and urbanized, implying the development of a larger middleclass, it is likely as in Europe and North America that family sizes will decrease.

However, if Africa remains stuck in "Phase I Agriculture" and does not evolve, the continent - ecologically, agriculturally and socially, is headed for a train smash. Given the existence of extensive agricultural and pastoral systems, unless this transformation takes place and results in a curtailment of the current population growth projections, both agriculture and conservation in general are doomed to failure. There is no reason for this transformation not to take place, as it did in North America and Europe during the 20th century, on possibly the resource richest continent in the world. However, this will require massive inputs in education and technologies. The question that must be asked is whether it is in the interest of the West to see Sub-Saharan Africa begin transforming the raw products that it currently furnishes them, thus diversifying and developing its own economies. This is probably not the case as epitomized by how development works (Chapter 11), current economic policies (Chapter 12), and relationships with the West in regards to the extraction and transformation of Sub-Saharan Africa's vast natural resources off the subcontinent (Chapter 13)!

For industrialized South Africa, this is another story. The rest of Africa's youth are flocking to South Africa's doorstep as they search for a better way of life not available to them in their own countries. Unfortunately, many do not have the education and South Africa, looking at transforming its own previously disadvantaged population, is being overwhelmed by this outside influx of people, pressurizing its housing, infrastructure, health and educational systems. To stem

this wave of poverty and hopelessness on its doorstep, South Africa may be the only industrialized country, which has a vested interest in exporting commercial agriculture and other technologies to the rest of the Continent to see it develop and give its hopeless masses, now out of kilter with their environment, some hope! There is only one caveat; South Africa must be careful that it does not become the next neo-colonial power, assuring that it bases this exportation of technology on appropriate environmental controls, reasonable salaries that can help create a middleclass, given the costs of living, training host country managers, and assuring that the wealth it helps generate is not expropriated by an elite but invested in the development of the continent. Ultimately, Sub-Saharan Africa must determine its own destiny instead of letting outsiders determine its future.

5.9.1 Over-population, Land Scarcity and Decreasing Agricultural Production in Sub-Saharan Africa

In Sub-Saharan Africa, when human and livestock populations were low, shifting cultivation (fallow) and transhumance pastoralism were appropriate to circumvent declining productivity. Colonialism, which brought in modern medicines and veterinary care and decreased tribal warring, brought about population explosions of both people and their livestock, which have had a major long-term adverse impacts on traditional management systems and associated natural resources, especially soils and vegetational cover. Due to limited land availability relative to population size and/or national regulations (e.g. centralization), these traditional management practices are no longer options over much of Sub-Saharan Africa.

By 1980, human populations in West Africa were already exceeding the carrying capacity of the land to support human populations living subsistence lifestyles (Table 5.14).

Table 5.14: Sustainable human population (no/km²) in West Africa under the traditional land uses of rainfed cropping, livestock production and natural forest cover

Zone	Under crops	Under livestock	Under natural forest	Actual (1980)
Saharan	0	0.3	0	0.3
Sahelian	5	2	1	7
Sahelo-Sudanian	10	5	10	20
Sudanian	15	7	20	19

Source: Steeds and Gore (1985 *In: de Haan, et al.*, 1997) with permission, UN& FAO.

According to de Haan, *et al.* (1997) in the

“Sahel, fuelwood is the most limiting factor in meeting the subsistence requirements of its human population. For the higher rainfall areas, livestock production remains below that necessary to satisfy subsistence requirements. For all the zones, however, fulfilling food subsistence needs with a combination of livestock and crop production (which is the normal situation) exerts less pressure on the land than satisfying fuelwood requirements”.

Long fallow periods of 5-20 years or more have become impractical because of increasing human and livestock populations. Losses of mineral nutrients during the cultivation phase, through runoff, erosion, leaching and crop removal, can no longer be restored by short periods of bush fallow of 1-5 years (Chirwam, Mafongoyo, Mbewe & Chishala, 2004 *In: Bationo, 2004*) or no fallow at all.

There appears to be a relationship between growing human populations and the degree of severity of soil degradation (Table 5.15).

Table 5.15: Land degradation severity and population density by region (Population density in number of inhabitants per square kilometer (km^2))

Region	Land Degradation				
	None	Light	Moderate	Severe	Very Severe
Sub-Saharan Africa	8	20	29	34	50
North Africa & Near East	2	22	34	15	22
North Asia East of Urials	4	11	10	19	20
Asia & Pacific	19	5	13	26	8
South & Central America	10	13	15	28	58
Europe	31	74	108	101	86
North America	5	23	25	21	NA
World	17	25	34	55	67

NA = Not applicable

Source: GLASOD (1987) with permission, UN& FAO.

The 193 million ha in agriculture estimated for Africa in 1995 (Table 5.16) is mostly in subsistence fallow agriculture, implying for every ha in production anywhere from three to six times this in fallow, which is being rapidly reduced or disappearing. By 2000, it was estimated that Sub-Saharan Africa had about 5.2 million ha or 3.7 % of the arable land⁷⁴ under cultivation in irrigation (see Section 5.12.1.3, Irrigation potential). This also implies that Sub-Saharan Africa comprises about 135 million ha⁷⁵ of rainfed cropland on the continent in production at any one time. FAO (2002a) estimates that 228 million ha or about 223 million ha in rainfed agriculture in Sub-Saharan Africa were in production

⁷⁴ **Arable Land:** “land under temporary crops (double-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years). The abandoned land resulting from shifting cultivation is not included in this category. Data for “Arable land” are not meant to indicate the amount of land that is potentially cultivable” (FAO, 2003a). **Permanent Crops:** “land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee and rubber; this category includes land under flowering shrubs, fruit trees, nut trees and vines, but excludes land under trees grown for wood or timber” (FAO, 2003a). **Arable and Permanent Crops:** “The two added together” (FAO, 2003a)

⁷⁵ 5.2 million ha/0.037 = x/1; x = 140,540,000 ha – 5,200,000 ha = 135 million ha in rainfed crops

between 1997-1999. FAOSTAT (2004) indicates that there are between 166,973,000 ha in arable land and permanent crops or 146,598,000 ha in arable land (Table 5.17). If one assumes that for every hectare in production, 3-6 ha are in fallow, it can be assumed that the FAO (2003b) estimate of 596,491,000 ha of land in Sub-Saharan Africa that has no to moderate soil constraints for rainfed agriculture is likely already under some form of low-input agricultural production (e.g., in production or lying in fallow), and is likely degraded as fallow periods decline and/or disappear. A very small percentage, mainly in Southern Africa, and in 2006 mainly in South Africa (since Zimbabwe's commercial agriculture is in disarray as a result of radical land reform), is farmed commercially to produce food crop grains.

Sub-Saharan Africa has relatively little unused fertile land and much of the region is arid. By the year 2050, its population is expected to expand to the point that 812 million people (46-54% of Sub-Saharan Africa's population) will live in countries that are potentially short of fertile land and 1.1 billion (63-74% of Sub-Saharan Africa's population) in countries facing a potential scarcity of water. Modernization of agriculture and more efficient use of water will be required to avoid actual scarcity in these countries (CALTECH, 2002; Vogel, 2002).

Table 5.16: Global trends in agricultural productivity and fertilizer use, 1979-1995

Geographic Area	Cropland (Million ha)	Cropland (ha) per capita	Crop Yields (kg/ha)		Irrigated Land as % of Cropland		Fertilizer kg/ha	Cropland 1979 -1981 1995
	1995	1995	1980	1995	1979 -1981	1995 -1981	1979 -1981	
Africa	193 ¹⁾	0.27	1,124	1,128	6	6	18	18
Asia	472	0.14	2,072	3,060	29	35	67	144
Europe	135	0.19	3,655	4,316	10	12	225	156
North and Central America	227	0.61	3,260	3,918	10	11	91	89
Oceania	53	1.87	1,089	1,886	4	5	37	46
South America	121	0.38	1,710	2,606	7	8	45	54
USSR (former)	226	0.77	NA	1,301	8	9	80	19
World	1,476	0.26	2,160	2,752	15	17	81	89

NA – Not Available. 1) Actual land under crop production in 1995

Source: FAO (1997b *In:* Barbier, 1998) with permission UN, UN University & FAO.**Table 5.17: Actual land use. Arable land and permanent crops in Africa and Sub-Saharan Africa**

Land Use Arable and Permanent Crops (1,000 Ha)	Year				
	1961	1971	1981	1991	2002
Africa	155,172	168,188	178,900	191,317	210,697
Africa South of Sahara	119,470	129,980	140,663	149,778	166,979
Land Use Arable Land (1,000 Ha)	Year				
	1961	1971	1981	1991	2002
Africa	140,574	151,038	158,784	168,206	184,905
Africa South of Sahara	108,213	116,600	124,574	131,514	146,605

Source: FAOSTAT (2004) with permission, UN& FAO.

It is estimated that by 2010, Sub-Saharan Africa agricultural fallow periods will have disappeared in 20 countries and will constitute less than 25% of arable lands in another 29 countries. Increased cultivation on less productive lands is a major cause of declining yields in many parts of Sub-Saharan Africa (Naseem & Kelly, 1999). Much of the current fallow agriculture, in which periods are ever shortening, is believed to be on marginal lands, which is the estimated 47.5% of Sub-Saharan Africa considered to have medium-low potential (see Table 5.5).

Population pressure is a major factor contributing to soil degradation and decreased productivity, and it is frequently but not uniformly linked to inequitable tenure systems. When land was more plentiful, traditional shifting cultivation/fallow agriculture was both a feasible and ecologically well-balanced system. As Africa's population has increased, so has the demand for land, and the fallow period has become shorter and shorter until, in many parts of Sub-Saharan Africa today, the land is being continuously cropped. In the absence of the regular replenishment of crop nutrients through fertilizers or organic methods, fertility has steadily declined and soil structure and water-retention characteristics have deteriorated (IFAD, 2002).

Per capita arable land has now declined from about 0.5 ha/person to less than 0.3 ha/person over the last 30 years in Sub-Saharan Africa (Winterbottom & Neme, 1997; Reich, *et al.*, 2001). FAO (1997b *In:* Barbier, 1998) estimates that there is 0.27 ha of arable land per capita in Africa (Table 5.16). CIAT (2002) estimate a per capita decline/ha of available agricultural land from 0.38 to 0.25 in the last 20 years in Sub-Saharan Africa. As a result of a major rural to urban migration in the 20th century linked to industrialization, in North America decreasing land per capita is not a problem, as less than 2% of the people farm to feed the majority living in urban settings so farms are large and commercially run (Ward, 2002).

Alemayehu (2000) states that 1.4% of the U.S. population (3.4 million) were farm workers in 1995. Europe is in a similar situation.

However, in Africa, with 60-70% of the labor force living subsistence lifestyles from agriculture (Roman, 2003), this is catastrophic. The human population increases in rural Sub-Saharan Africa have resulted in small economically unviable plots of land at the level of the household, forcing people to abandon fallow, mine the soils, emigrate to urban centers in search of work to support the rural family through remittances and ultimately to begin accessing marginal agricultural lands best employed for other land uses (e.g., wildlife/livestock, forestry, watershed protection). The latter often places small-scale farmers in conflict with other resource users, as well as results in major habitat degradation. As this form of agriculture, which has not changed for the past 2000 years, results in soil exhaustion and crop failure, often the only thing left is to send children to work for someone else. Studies have shown that cultures dependent upon subsistence farming have the highest rates of child labor, in most cases these victims of this “poverty trap” being denied a formal education – condemned to an endless cycle of poverty passed on from one generation to the next (Wax, 2006).

Decreasing land per capita has occurred despite widespread conversion of forest and wetlands to cropland, the extension of farming onto marginal upland soils (Winterbottom & Neme, 1997) and expansion into traditional pastoral areas. In most countries, poverty increases among the rural population with decreasing land per capita (IFAD, 2002). Poverty tends to be concentrated in households with farm sizes under one ha, and especially under 0.5 ha. For instance, in Malawi, over 40% of smallholders cultivate less than 0.5 ha, with an average farm size of 0.28 ha. However, in drier areas, average smallholder farm size is larger, sometimes reaching 5-8 ha, but low land productivity under conditions of limited

rainfall means that these farms may not even cover household subsistence needs (IFAD, 2002).

Martin and O'Meara (1995) believe that population rather than environment (e.g., global warming, El Niño, etc.) is the most serious cause of continuing poverty in Africa. The population is outstripping the growth of economies (e.g., declining per capita GDPs), and growing population pressure on the resource base is leading to environmental degradation, and the reduction of carrying capacity of the land. Likewise, Virmani, Katyal, Eswaran and Abrol (1994 *In: Reich, et al.*, 2001) believe that land degradation in Africa is clearly human induced (e.g., over population resulting in decreasing agricultural fallow and over-grazing). They also believe that there is increasing evidence that land degradation is a driver of climate change. Reich *et al.* (2001) also concluded for Africa that:

1. Under low-input systems, the potential productivity of the soils cannot be realized and additionally stability of production will be difficult to achieve. A systematic decline in productivity is the result of degradation processes;
2. Desertification is rampant on much of the continent and will permanently destroy the agricultural production potential. Correcting the degradation effects will be more expensive and the low resilience characteristics of many of Africa's soils suggest that high levels of productivity cannot be expected even after mitigation technologies are used; and
3. Under current cultivation and land-tenure systems, most of Africa's countries will be unsustainable in agriculture and if desertification is not controlled, their ability to attain sustainable food production will be significantly reduced.

The risk of desertification is highly linked to hunger, malnutrition, land hunger and the search for new economic opportunities, resulting in political destabilization. (see Section 5.7.4.4, Land reform and civil war in the Ivory Coast and Section 5.11, CONFLICT LINKED TO OVER-POPULATION AND DESERTIFICATION).

Land scarcity as projected for 2050 (CALTECH, 2002) is already an issue in many African countries as fallow periods disappear or decline due to increasing human populations.

Rosegrant, *et al.* (2001) indicate the following Sub-Saharan countries still have significant amounts of high potential land that may be available for agriculture (Table 5.18).

Table 5.18: Countries in Sub-Saharan Africa with significant amounts of remaining high-potential arable land, 1994

Northern	Central & Western	Southern	Eastern
Chad	Benin	Angola	Tanzania
Ethiopia	Cameroon	Lesotho	Uganda
Mali	Central African Republic	Madagascar	
Sudan	Congo Republic Ivory Coast Democratic Republic of Congo Gabon Ghana Guinea-Conakry Liberia Nigeria Togo	Malawi Mozambique Swaziland Zambia Zimbabwe	

Source: FAO (1994) In: Rosegrant, Paisner, Meijer and Witcover (2001, Table 6.10), with permission, International Food Policy Research Institute (IFPRI).

More than 50% of the land that could be opened up is in just seven countries of tropical Latin America and Sub-Saharan Africa (FAO, 2002a), indicating that the majority of Sub-Saharan Africa's arable land is already in use. In Sub-Saharan Africa, this includes Angola, the DRC and Sudan. FAO (2002a) states that while there is still surplus land in these regions, expansion may involve cutting back on

long rotation and fallow periods. In other words expansion means intensification of agriculture by placing fallow land, where there are “no to moderate constraints”, into permanent use through the use of fertilizers, pesticides, genetically modified crops, double cropping, crop rotation, etc. (see Section 5.12.1, Technological Solutions to Africa Food Crisis and Land Degradation). If fertilizer use does not significantly increase, this will likely result in soil mining and stagnant or declining yields (FAO, 2002a) on lands placed in permanent agriculture without the luxury of allowing the land to recover its fertility through long fallow periods.

5.9.2 Over-Population of Prime Agricultural Land for Low Input Agriculture is also Commercially Viable Land

Much of the prime and high potential lands for low-input agriculture shown in Figure 5.4 (Eswaran, *et al.*, 1996) also appear to be the same geographical areas that have high yielding high-input commercial potential to produce food to feed large areas of Africa:

- The high yielding high altitude grasslands of South Africa, Zambia, Zimbabwe, parts of Mozambique, Tanzania (e.g. Serengeti/Maasailand) and Kenya (e.g., Mara) that respond to high-input agriculture;
- The highlands of Rwanda, Burundi, Tanzania and Kenya; and
- The Sudano-Guinean rainfall zones of West Africa (e.g., the Ivory Coast, southern Burkina Faso, southern Mali, Ghana, Togo, Benin and parts of Nigeria), as well as along major floodplains (e.g., Niger, Senegal, Gambia Rivers).

Based on this information, between 11% (Eswaran, *et al.*, 1997a; 1997b both *In:* Reich, *et al.*, 2001) and 16.3% (Eswaran, *et al.*, 1996) of the land in Africa, 27%

in Sub-Saharan Africa, if properly managed through 1) traditional low-input fallow agriculture, 2) modern commercial high-input agriculture, or 3) improved traditional agriculture linked to Integrated Nutrient Management (INM), should be considered as critical agricultural land. The remainder of land is mostly savanna (70-75% of Sub-Saharan Africa) managed as fallow agriculture, which, as discussed, appears to no longer be sustainable given low resource/population ratios that are resulting in reduced/eliminated fallow and over-grazing across the savannas of the continent. As noted by Reich, *et al.* (2001), in these marginal savanna lands, it is likely that high levels of productivity will not be achieved even after mitigation technologies are used

Unfortunately, many of these high potential lands are already over-populated with both people and livestock, diminishing their potential for high yields for a number of reasons when used for low-input agriculture (e.g., loss of fallow, nutrient mining, soil erosion, etc.), or in the case of Zimbabwe because of the internal politics linked to land reform. For instance, the civil war in the Ivory Coast, disrupting agriculture, is a land issue as land hungry outsiders from countries like Burkina Faso have flocked into this country (see Section 5.7.4.4, Land reform and civil war in the Ivory Coast). A large area of quality soils appears to be in Nigeria, which by about 2050 will have a population of from 258 million (Brown, 2003a) to 307.4 million (Pop. Ref. Bur., 2004), about the population of the USA in 2004 in a country the size of Texas, with the total population of Sub-Saharan Africa by 2050 ranging from 1.5 to 1.8 billion people (United Nations, 2004) (see Section 5.11.2, Over-population, Desertification and Instability, Nigeria). Nigeria alone will contain somewhere between 14-20% of Sub-Saharan Africa's population. Unless intensification of agriculture occurs, these high potential soils will likely be rapidly depleted, if this is not already the case. On a positive note, the Nigerian government has invited Zimbabwean white commercial farmers to settle there as long as they act as "mentors" to train traditional farmers in

commercial intensive farming techniques (BBC, 2004; Bridgland, 2004). Meanwhile all along the coast of West Africa, there is a major exodus out of the land degraded Sahel that could rapidly over-crowd and deteriorate the high potential soils from Ivory Coast to Nigeria, as indicated in Figure 5.4 (see Section 5.7.5, Food Security and Urbanization in Sub-Saharan Africa). Thus, these areas will require the application of modern agricultural practices to maintain their soil fertility and thus productivity.

5.9.2.1 Over-population of prime agricultural lands in the Highlands of East Africa

“The most productive agricultural areas of the region are in the moist sub-humid and humid climatic zones. The mountainous areas have more rainfall and are more productive. Small-scale farmers grow cereals such as wheat, barley and maize in the highlands of Ethiopia and Kenya, and these areas support relatively dense populations. Lower-altitude areas in this moister zone support root crops, plantain and coffee, while in the coastal areas, coconut, cashew, root crops and fishing are the main sources of livelihood.

The high-rainfall and potentially highly productive areas include more than half of Uganda and Rwanda, and quite large areas in Ethiopia, Kenya and Madagascar. These areas support tree crops such as coffee, palm oil and cocoa, as well as bananas, rice and sugar cane where the temperatures are suitable. About 54% of the region’s poor live in these areas” (IFAD, 2002).

There is a concentration of high quality lands in West and East Africa, including parts of the Central African Highlands, though these areas have high population densities. Population pressure and land degradation are major problems which go in tandem and both must be addressed together to continue sustainability. For instance, human population pressure and subdivided farms in the highlands of Kenya, Tanzania, Ethiopia, Rwanda, Burundi, western Kenya along Lake

Victoria, southwestern Uganda, etc. are lowering this potential considerably under current conditions.

Adams and Infield (1998) argue that in the Kisoro District of southwestern Uganda, agricultural problems include a land shortage resulting in reduced fertility from continuous cultivation, land fragmentation with one farmer having a number of distantly separated plots, no pesticides, lack of improved seeds, no money to buy or training in how to properly apply fertilizer, inadequate agricultural extension, not enough manure as fertilizer, lack of mulching grass from over-grazing, labor shortages and distant markets with inadequate transport.

In the case of Kenya (see Chapter 3, 3.11.1, Population, Kikuyu and the Mau Mau), even during the colonial days by the middle of the 20th century, land hunger was a problem from compression through confiscation of land by settlers, land subdivision and increasing human populations. Land hunger constituted one of the key reasons for the Mau Mau uprisings. Kenya is being squeezed by spreading deserts and desertification. “As elsewhere, the unholy triumvirate of over-grazing, over-plowing and over-cutting of trees is contributing to the loss of productive land” (Brown, 2003a). While land hunger is a major issue for the Kikuyu farmer, forcing him into less productive areas such as Maasailand (see Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya) and the Laikipia Highlands (see Chapter 11, Section 11.11.9.4, Human/wildlife conflicts), Ian Parker (2007a) argues that

“that fragmentation (of land) notwithstanding, production per unit area in the Kenya highlands has consistently risen since independence: i.e. more is being produced off less. At the same time prices for produce have risen...at some indeterminate date in the future ‘the wheels will come off’. The difference between Kenya and Southern Africa is that here we exist on fertile volcanic

geology with deep soils and two rains a year, while there you (Southern Africa) live on ancient, very infertile cratons and a single annual rainfall. In relative terms all the bad points will come earlier in Southern Africa" (see Section 5.5.2.3, Nutrients, pH, acidity and carrying capacity).

The major thrust of national and regional strategies must focus on maintaining the high productivity of these lands, which calls for assisting the farming community to move up to medium-input systems. These lands will be most responsive to the introduction of high yielding cultivars and modern pest and weed management techniques (Eswaran, *et al.*, 1996).

Over-Population of Prime Agricultural Land in Ethiopia

It is estimated that deforestation in Ethiopia is 1,000 km²/year, the forest having been reduced from 40% of the surface area by the 1900s to 2% by the 1990s (Alemayehu, 2000).

"The tropical highlands, as in Ethiopia, Lesotho and Cameroon (Central Africa), have rainfed agricultural systems based on small-seed cereals, pulses and oil crops. Animal power is often used for land preparation. Soil degradation is a major problem for these mountainous environments. Traditionally this is tackled by a combination of crop rotation involving legumes, the application of animal manure and allowing animals to graze harvested fields, as well as fallowing usually for one or two years...Nowhere is the lethal interaction of poverty and environmental degradation more evident than in Ethiopia. About half of the country's highland area is significantly eroded, reducing yields by between 2 and 3% a year. According to a 1986 study by the UN Food and Agricultural Organization (FAO), over 1,900 million tons of soils are lost from the highlands annually. If the trend continues, some 38,000 km² (3.8 million ha) will be eroded down to bare rock by the year 2010, and a further 60,000 km² will have a soil depth of 10 centimeters, below which the soil would be too shallow to support cropping. About 2 million ha of farmland are already estimated to be beyond recovery" (Nana-Sinkam, 1995).

Similarly Brown (2003) states that Ethiopia “is losing an estimated 1 billion tons of topsoil a year. This is one reason why Ethiopia always seems to be on the verge of famine, never able to accumulate enough grain reserves to provide a meaningful measure of food security”. Population pressures and agricultural practices also have major implications with regard to biodiversity and deforestation (see Section 5.9.4.6, Deforestation in afromontane forests - Deforestation in the Ethiopian Highlands).

Population and Conflicting Land Uses, High Altitude Grasslands of East and Southern Africa

“The dry sub-humid climate zone includes vast savannas at varying altitudes, where rainfed cereal production dominates the cropping system. At altitudes of 1,000 meters or more, the savannas provide relatively cool temperatures (for the tropics) and allow a variety of crops. In their moister areas, the savannas support a maize-based mixed farming system, giving rise to the great maize belt of the region, which takes in large tracts of Angola, Kenya, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. About 32% of the region’s rural poor live by these maize-based farming systems” (IFAD, 2002).

Many of these areas may be considered high altitude grasslands that have a high potential for commercial agriculture. “Grasslands are defined as those areas where grasses dominate the vegetation and where woody plants are absent or rare” (DEAT, 2001).

This should also include the temperate grasslands of South Africa/Lesotho, which consist of 349,174 km² of which 49% has been turned into agricultural lands producing maize, sunflowers or other crops (O’Connor & Bredenkamp, 1997 *In: Cowling, et al.*, 1997). “Grasslands cover the high central plateau of South Africa, inland areas of KwaZulu-Natal and the mountain areas of the Eastern

Cape Province". They occupy 24.1% of South Africa's surface area (DEAT, 2001). A relatively new but serious threat to these South African grasslands is tree plantations for pine (*Pinus. spp.*) and eucalyptus (*Eucalyptus spp.*) in the higher rainfall areas of the eastern plateau (O'Connor & Bredenkamp, 1997 *In: Cowling, et al., 1997*), mostly for export to the Far East. In Southern Africa, the high altitude grasslands of South Africa, Zimbabwe and to a lesser degree Zambia will be critical in the long run to helping the region achieve a level of food self-sufficiency through assuring that these areas are retained for commercial agriculture. Currently, South Africa is the only country in Sub-Saharan Africa that can feed itself. However, drought conditions in 2007 could force South Africa to import between 1.4 and 1.8 million tons of maize.

A major problem with these high altitude grasslands is that they are often prime pockets of biodiversity, and can be in conflict with conserving areas for Africa's mega-fauna and traditional pastoralists.

"For instance in South Africa: the grassland biome (24.1% of South Africa's surface area) is regarded as the third-richest area in terms of plant species diversity, with a total number of 3,788 species. The most noteworthy species with a wide distribution is, *Themeda triandra*, more commonly referred to as *rooigras*. In the past the ungulate fauna (hoofed animals) of the Highveld grasslands included vast herds of blesbok (*Damaliscus dorcas phillipsi*), black wildebeest (*Connochaetes gnou*) and the springbok (*Antidorcas marsupialis*). A surprisingly rich variety of birds are found in the grasslands, including the blue crane (*Anthropoides paradiseus*), black korhaan (*Eupodotis afra*) and helmeted guineafowl (*Numida meleagris*)" (DEAT, 2001).

As noted, long ago, South Africa made a decision that much of this land would be devoted to food production.

Southern Maasailand of Tanzania and Maasai Mara, Kenya, are facing increasing threats from both an invasion by small-scale farmers moving into more marginal areas as the highly productive highlands become over-populated, and from commercial wheat and seed-crop schemes as well as winter vegetables and cut flowers for European markets. The trade off is the loss of critical wildlife habitat – in many cases rainy season dispersal areas for game from national parks, the bottleneck to carrying capacity for these parks (Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya and Chapter 9, Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”). Also, see Chapter 3, Section 3.11.1, Population, Kikuyu and the Mau Mau.

Also, while human populations may be comparatively low/km², the increase in humans in the 21st century, changes in land tenure, and land compression from the creation of parks and protected areas (see Chapter 3, Section 3.8.4, Land Compression and the Maasai of Kenya and Tanzania and Chapter 11, Section 11.10.6, Eco-Colonialism-Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers), and increased livestock numbers are resulting in over-grazing and major habitat degradation in these areas as well as the loss of prime wildlife habitat. This applies to both dry and rainy season grazing areas.

5.9.3 Fallow Agriculture, Over-Population and Agricultural Production

The following image of “slash and burn” agriculture, primarily in the Democratic Republic of Congo, visually depicts the problem with traditional fallow agriculture in Sub-Saharan Africa as discussed above; too many people, not enough land, decreasing fallow periods, soil degradation, decreased crop yields, deforestation and adverse impacts on climate from decreased vegetational cover,

decreased transpiration and clouds of smoke pouring into the atmosphere all over the continent (Figure 5.9).

5.9.3.1 The Sahel, over-population and declining fallow periods

“The most salient impact is the increase in human and animal population that followed the application of Western medicine. The people of the Sahel are increasing at a rate of 2.5% a year, one of the highest rates of population increase in the world” (Hardin, 1977).

“Over the past 25 years, both human and animal populations have grown rapidly at average annual rates of 2.6 and 1%, respectively” (FEWS, 1997).

“Between 1960 and 1990, the region's total population grew from 85 to 193 million people...The rural population affected by the activities of rural development was, in 1990, a little over 30 million. Today (1996) the figure is approximately 35 million, distributed among some 50,000 villages or encampments” (Snrech, 1996).

In the Sahel portion of Sub-Saharan Africa, it is estimated that only 8% of the land area is suitable for agriculture, and irrigated agriculture (traditional recession, and modern) currently occupies only about 5% of this land (5% of 8% or 0.4% of the land suitable for irrigation)(Moore, *et al.*, 2000). Similarly, FAO estimates that only 4% (212,000 ha) of the Sahel's 5.3 million km² is suitable for agriculture; while at the other extreme, 64% of the Sahel's land mass is completely unsuitable for agriculture. Most of the population lives between the two extremes on the 32% of the land considered marginal for rain-fed agriculture, using it for crops, pasture, and fuelwood (FEWS, 1997).

Fallow has been reduced from 10-15 years to one to two years or has disappeared altogether, resulting in declining food and cash crop yields and pushing farmers onto marginal lands. This often results in conflicts with traditional herders who

use these areas as rainy season grazing lands. Despite the semi-arid zone's low theoretical support capacity, population density is often higher than in sub-humid and humid agro-climatic zones of Sub-Saharan Africa (Moore, Kabore, Gnoumou & Bertelsen, 1999; Moore, *et al.*, 2000).

Traditional Knowledge and Fallow Agriculture

The savanna farmers have a comprehensive knowledge of their environment. Over centuries, through a system of trial and error, they determined how to balance their demands on the natural resources and the ability of the resources to satisfy their basic needs. They can relate the fertility status of the land and its suitability for one or another crop to the vegetation which covers it and the physical characteristics of the soil. They can also assess the staying power of the soil i.e. the number of seasons for which it must be rested before good crop yields can be obtained again. Traditionally, peasant farmers have coped with Africa's fragile ecology by leaving soils fallow for long periods and developing complex inter-cropping systems, designed to minimize risk and maximize sustainability (see Chapter 2, Section 2.3.2, Pasture and Water and Section 2.3.3, Fallow Agriculture in Low Productive Areas). Today, these systems are breaking down in the face of a range of mutually reinforcing local, regional and international pressures. In the savanna, one of the best ways of maintaining soil organic matter is by fallowing. First, a variety of short-lived herbs appear. These early colonizers tolerate the daily extremes in temperature and water stress and provide the conditions for the establishment of other plants including legumes. Once legumes appear in the system, both nitrogen and organic matter increase. Left alone, the sequence of plant appearances would continue until stable climax vegetation is established. It is mainly population pressure that has caused this system to break down, resulting in devastating soil degradation given the terrifying name of desertification (Nana-Sinkam, 1995).

Fallow Periods Disappearing in the Gambia

With the exception of irrigated rice fields and domestic gardens, agricultural land use is generally extensive, in the meaning of low/few inputs and low returns. “Slash and burn” of bush or fallow land subsistence agriculture is the norm. The traditional means of keeping soil fertility at satisfactory levels are shifting cultivation and inter-cropping. Shifting cultivation includes using fallow periods and crop rotation. In the Gambia, traditionally the soil was subject to a fallow period of over 20 years after four years of cropping (Fyhri, 1998; Hennig, 2000).

“A typical cycle of crop rotation in The Gambia featured groundnuts in the first year, thereafter late millet, early millet or sorghum and finally groundnuts again. Finally, inter-cropping is common in The Gambia. Inter-cropping of different crops, with differing demands of water and nutrients, is an effective way to postpone soil exhaustion. In The Gambia, inter-cropping of groundnuts with millet and maize, early millet with late millet and maize or sorghum with late millet are somewhat common. Single cropping, with the exception of sorghum, is however getting more and more the norm. While crop rotation, and to some extent inter-cropping, still is widely practiced throughout The Gambia, long fallow periods are coming to an end. From a traditionally fallow period of over 20 years, they had dropped to one or two years in 1983, having severe effects on soil fertility. Now, many fields do not experience fallow periods at all” (Hennig, 2000).

Decreasing fallow and expansion into marginal areas has had a major impact on forest cover (Table 5.19).

“Applying organic fertilizers (manure) has been a traditional means of upgrading soil fertility. Almost 50% of farmers used this method in 1982, but numbers are probably higher today. The use of chemical fertilizers is not widespread in The Gambia” (Hennig, 2000).

**Table 5.19: Changes in vegetation types over time, The Gambia
Land use classes: Coverage of The Gambia (%)**

Closed forest	Open forest	Savanna	Cultivated areas	Other areas
1980 2,64	7,60	42,35	25,81	21,60
1988 1,53	4,92	40,20	31,34	21,71

Source: Ridder (1991) In: Hennig (2000) with permission, AFROL.

Fallow Land Management Compromised by “Subsistence Ethic” in Two Senegalese Villages

In this case study (Grigsby, 2001), which was undertaken in two villages near Tambacounda, the control and management of the fallow period by the household is made difficult due to increasing population pressures, and the “subsistence ethic” under common property management to “lend” your fallow land to a needy neighbor in the community, even if this land has not completely recovered. Thus, as populations increase, control over fallow becomes more difficult.

Bush fallow agriculture is the principal land use, with fallow periods ranging from 3-25 years and three to four years of cultivation. The area is part of an ecological belt of dry woodland, and natural and derived savanna that stretches across the continent, and the portion in Mali and Senegal comprises many ethnic groups practicing variants of sedentary bush fallow. Rainfall ranges from 500 - 1500 mm during a three to five month growing season, arranged along a north-south gradient, placing it in the Sudano-Sahelian Zone.

The cultivation cycle's principal yields are millet and peanuts. During a fallow succession from grass species to woody vegetation, accumulation of biomass and greater nutrient retention in trees and shrubs represent the principal means of restoring soil fertility. The fallow cycle yields a wealth of "secondary" resources (e.g., fodder, fuel, food, construction materials) exploited both for local

consumption and market sale. Bush fallow as a land use is complemented by other land uses important to the productive enterprise, such as forestland, fenced gardens, “backyard fields” (*sokofeforow*) and low-lying rainfed draw areas.

Land inheritance is patrilineal. Male household heads, who allocate land first and foremost to the cultivation of household grains, largely control land, labor and equipment. Household heads hold many tenure rights, including rights to control or transfer customary fallow or create tenure (clearing forestland), and the right to control access to claims made by household members and others on bush fallow lands, which comprise the vast majority of land devoted to household grain production. Transferring land outside a lineage is only reported in instances where land-rich households are helping a newly immigrated household settle into the village. The village chief may also designate livestock corridors in an effort to protect household grain fields during the growing season. Important but relatively low-impact uses may include sacred forests and cemeteries.

Villagers reported increasing pressure on land, for three reasons: more people are participating in household subsistence activities, village populations are growing, and some households have increased hectarage via animal traction and plow farming. The head of household “A” can clear and cultivate his own fallow claims. He can also make a valid claim to clear and cultivate fallow (presumably in some stage of recovery) claimed by household “B”. However, household “A’s” exclusive rights to that fallow are limited seasonally to the growing period and ultimately by declining soil fertility. The head of household “B” retains long-term rights to the fallow, but may find it difficult to refuse access to would-be tenants so long as the parcel is not currently under cultivation. Thus, long-term tenure security may be punctuated by tenancies and crop rotations of varying frequencies. This would seemingly complicate any efforts to actively manage fallow.

While the subsistence ethic may discourage many economic-based innovations in resource and agricultural production and accommodate ecologically unsustainable resource use, it is an important concept linking access to resources with cultural and material survival. At the household level, the subsistence ethic appears to discourage an overt strategy of accumulation, exerting subtle pressures to make land and resources that are not currently used available to others, presumably for subsistence (Grigsby, 2001). However, given today's human populations in Senegal, there is apparently not enough land to allow everyone to farm without greatly reducing fallow, resulting in soil mining and ultimately reduced yields and degradation. In 2003, the Senegalese National Shooting Team (*pers. comm.*) was in South Africa for the African championships. The principal author, who had been a member of the *Association Darkois du Tir* (ADT), met with the team and they explained that the rural to urban exodus had accelerated to the point that Dakar was maybe 10 times the size in human numbers compared to the 1980s when the principal author lived there. During the week, the only way to get around Dakar is via môtô scooter or to walk, as the traffic is so jammed. They explained that there was little future for most people in rural Senegal.

Impacts of Over-Population on Agriculture in Southern Burkina Faso

Once the land constraint becomes binding, however, as in the case of the Mossi Plateau region in the Sahelian portion of Burkina Faso, yields and production decline contributing to urban migration (Vlek, 1993 *In: Gruhn, et al., 2000*). René Dumont (1966) believed that in the Sahel, outside of areas with irrigation potential (e.g., floodplains), efforts to intensify agriculture would be of very limited value. He states, as is occurring, that stepping up of massive agricultural migration would be necessary to “decongest” the Sahel by moving populations towards plantations in the forest zone. The question is at what cost would this be

to these higher rainfall areas south of the Sahel, if their carrying capacities are also exceeded by this influx, while continually practicing low input cultivation?

In the Mossi plateau region, population densities range from 90 – 120 persons/km². This pushes people from over-populated areas to less populated areas, accelerating land degradation. For instance, around the Comoé-Leraba Game Reserve of southern Burkina Faso on the edge of the Sudanian and Guinean rainfall zones, “slash and burn” low-input agriculture of *igname* (yam) provides one-year of production followed by 10-years of fallow. This area is being inundated by small-scale farmers from the north, placing tremendous pressure on the “land chiefs” to allow people to cultivate in the game reserve (Pavy, *pers. comm.*) (see Chapter 9, Section 9.8.9.1, Management of Comé-Leraba Game Reserve, southern Burkina Faso). It is also believed that a large portion of the Ivory Coast’s civil war can be linked to the heavy migration of Burkinabé from the overpopulated north, placing tremendous pressure on the Ivorian economy, natural resource base and infrastructure (see Section 5.7.4.4, Land reform and civil war in the Ivory Coast).

5.9.3.2 Loss of fallow turning wildlife into a short-term resource, Fouta Djallon Mountains, Guinea-Conakry

By the mid-1980s, 25 years of Sekou Touré’s repressive regime had flirted with communism, run off or killed most intellectuals, and run the country into the ground economically. People were trying to survive and in doing so auctioning off their future. The Fouta Djallon Mountains were over-populated. Only small plots *tapades* or *sunture* near the home using “green manure” to produce vegetables by women were viable. Twenty-year fallow periods of extensive agriculture were disappearing, not allowing the lateritic soils to recover from acidification, nutrient leaching and aluminum/iron toxicities. Yields from *tapades*

were more important for household provisioning than from other fields. Most land would no longer support the traditional crops of sorghum and millet, requiring cultivation of the lower yielding wild grass cereal called *fonio*, *Digitaria exilis*. In the prefectures (districts) of Labé, Koubia and Mali (borders Senegal), through inter-cropping, *fonio* was grown on 95% of the fields (outside of *tapades*), groundnuts on 37%, rainfed rice on 17% and sorghum on 8%, indicating the likelihood of massive degradation in these areas. *Fonio* was second only to rice as a food crop. The 55% increase projected in land cultivated between 1984 and 2000, necessary to maintain the population increase at the 1984 per capita food output would likely occur only by a drastic reduction in fallow periods. At the time, per capita land under cultivation was only between 0.18 ha in the high population density area around Labé and 0.37 ha in the region of Koundara, Guinea-Conakry, averaging 0.24 ha/per capita for the entire Gambia River Basin. People were slashing and burning into virgin forests that served as important cover for the watersheds supporting major dams being planned/existing on the Senegal and Gambia Rivers (University of Michigan, 1985a) (see Chapter 7). Cereal demands in the Gambia River Basin portion of the Fouta Djallon, Guinea-Conakry were projected to climb to 116,000 metric tons by 2000, whereas they were only producing 78,000 tons at the time of the study (University of Michigan, 1985b). Neighboring “*Haut Guinea*”, the watershed for the Niger River, is believed to be in a similar situation. Revenga, Murray, Abramovitz and Hammond (1998) estimate that 96% of the original forest⁷⁶ in the Niger River Basin is gone and that deforestation is taking place at 6%/year. Fairhead and Leach (1996 *In: McCann, 1999*) argue that what many consider forest is fallow land and not virgin forest. The real question arises, virgin or secondary forest on fallow land, to what degree are fallow periods declining? Declining fallow implies more land in

⁷⁶ Original forest cover refers to an estimate of the extent of closed canopy forest in existence 8,000 years ago, assuming current climate conditions. Current forest cover refers to amount of closed canopy forest in existence today (Revenga, Murray, Abramovitz & Hammond, 1998).

agriculture and less in forests at any one time and in the long-term soil mining and decreasing agricultural productivity under traditional low-input systems.

Due to increasing populations, decreasing agricultural production and increasing desires to enter into a moneyed economy, among others, wildlife was also being mined as a short-term resource and was more valuable than agriculture. As one Fulani Marabout lion hunter in the Guinea-Conakry highlands explained to the principal author in the mid-1980s,

“You may think it wrong of me to hunt lion for a living. You get paid every two weeks down in the big city in your air-conditioned office. For one lion skin, I get what I make out of the ground in a year. You can put me in jail but when I get out, I will do it again. I have a wife and children to feed. You have one of two choices if you wish me to stop. You can shoot me now or find me another way of life” (DeGeorges, 1992).

5.9.3.3 Over-population and loss of fallow putting pressure on Park “W”, Niger

“Conflicts exist between indigenous livestock husbandry and nature-conservation areas, as evidenced in the case of “W” National Park” (Lycklama à Nijeholt, *et al.*, 2001). “In this instance, herders want to go inside the park because of the scarcity of pastures outside (due to increasing agricultural surfaces). The park is the only grassy place at the end of the dry season. As a matter of fact, the presence of livestock in the park reduces herder-farmer conflicts outside. The prohibition on clearing fields in the park has increased or saved the availability of grass. While officially this grass is not accessible to herders, it is in practice (Benoit, 1999 *In:* Bourgeot, 1999)” (*In:* Lycklama à Nijeholt, *et al.*, 2001).

On the downside, it is believed that the tens of thousands of cattle enter the park, since expanding agriculture excludes herders from former dry season grazing on the park’s periphery (East, 2005).

5.9.3.4 Over-population and livestock, a threat to wildlife in Northern Cameroon

People were relocated from the over-populated Extreme North Province to the Northern Province of Cameroon. Their implication in cotton production for the French/Cameroonian government SODICOTON Company is slowly encroaching on 28 hunting blocks that serve as a buffer for three national parks. It is estimated that areas covered by cotton increased from about 14,000 ha in 1988 to nearly 30,000 ha in 1996 (Saidou, 1998).

This is an important pocket of biodiversity in Northern Cameroon. This Western Africa forested savanna preserves a typical woodland fauna including game species such as large ungulates Lord Derby Eland (*Taurotragus derbianus gigas*), Western Roan/antelope *cheval/koba* (*Hippotragus equinus koba*), sing-sing waterbuck/*kob defassa* (*Kobus defassa unctuosus/Kobus defassa defassa/Kobus ellipsiprymnus unctuosus*), western hartebeest/*bubale* (*Alcelaphus buselaphus major*), *cob du buffon* (*Kobus kob kob*) and harnessed bushbuck/*guib harnaché* (*Tragelaphus scriptus scriptus*), as well as the West African savanna buffalo (*Syncerus caffer planiceros*), hippopotamus (*Hippopotamus amphibius*), lion (*Panthera leo*), a few remaining western black rhino (*Diceros bicornis longipes* – may be extinct by now??), savanna elephants (*Loxodonta africana africana*) and the wild dog (*Lycaon pictus*). The key protected areas include the Faro (330,000 ha), Bénoué (>180,000 ha) and Bouba-Njida (220,000 ha) National Parks.

As human populations grow, demand for land grows, while rural communities see little or no long-term value in wildlife. As all over Sub-Saharan Africa, the combination of turning 44% of Cameroon's Northern Province into parks and protected areas (Gomse, 2003), resulted in compression of human and livestock populations. At the same time artificially increasing the human and livestock

populations through relocation programs from an over-populated Extreme North Province (Province d'Extrême Nord) in the 1970s (Saidou, 1998) has been a recipe for disaster. This has resulted in habitat degradation outside protected areas and encroachment into these areas by an ever-expanding population, especially by small cotton farmers.

Currently, uncontrolled immigration is resulting in the Northern Province having the highest population growth rate in Cameroon at 4.3% (Saidou, 1998). Poaching and illegal firewood collection is a major problem in both the parks and hunting areas (Saidou, 1998). East (1998) raises concern that land fragmentation resulting from this relocation is a major risk to the Lord Derby eland and other populations of wildlife in the three parks and their hunting blocks. Inadequate grazing land, especially in the dry season, exists for Fulani herders. Though, not officially sanctioned, the head of Bénoué National Parks allows herders in to graze during times of extreme drought (Gomse, *pers. comm.*). The recent development of co-management agreements between peripheral communities and MINEF is facilitating the negotiation for access to natural resources inside these protected areas (Tarla & Bachirou, 2004).

Thus over-population, commercial cotton farming and increasing livestock populations, combined with a loss of traditional controls (see Chapter 11, Section, 11.11.6.1, Introduction), threaten wildlife in the Northern Province unless these areas and associated wildlife become economically and culturally important to the future of rural communities. Currently, this is not the case. Such issues are discussed in more detail in Chapters 9 and 11. A 2004 wildlife census by Donfack and Tsakam (2005) indicated a major decline in key species within Benoué National Park and hunting blocks 1 and 4, though no confidence limits were provided:

	<u>1975</u>	<u>YEARS</u>	<u>2004</u>
Number of Lord Derby Eland	375		50
Number of Buffalo	2,060		72
Elephant	-		100

5.9.3.5 Decreased fallow associated with over-population, decreased mobility and land use changes, Sangha Basin, French Equatorial Africa/Afrique Équatoriale Francaise (AEF)

Loss of mobility as a soil management tool from French colonial policies of *regroupement* into villages along roads (see Chapter 3, Section 3.1, COLONIAL STATE IN AFRICA), increasing populations, creation of concessions leased to Europeans, and eventually parks and protected areas resulted in fallows of seven to eight years being reduced to two to three years. Gaining control of the Sangha Basin following WWI, the French required villages to clear and cultivate land for 500 meters around villages to eliminate tsetse fly habitat as the result of epidemics of human sleeping sickness. Previously the average plot had been one ha. They were required to cultivate these larger areas with potatoes, peanuts, maize and soy near houses; cassava and bananas further away. The French agricultural policies at the time dictated what was cultivated and the amount of land under cultivation, but not land management practices. However, as the French vision grew of Ubangi-Shari-Chad (of which the Sangha became a part) becoming an agricultural powerhouse, larger areas of forest were cleared. Forest clearing increased following WWII, as local people were pushed into cultivating coffee and cacao. This resulted in decreased cultivation of food crops and a corresponding decline in the nutritional status of local residents. Peasant production of cash crops was resisted by private European concessionaire plantations. Slowly maize was abandoned as a primary crop in favor of less

nutritious cassava that required far less planting and weeding time than maize. Cassava also became a cash crop to feed workers employed by the administration and artificial populations associated with concessions such as logging camps. Both fallow and crop diversity declined while field sizes increased (Giles-Vernick, 2002).

5.9.3.6 East and Central Africa, loss of fallow periods

In countries with limited cultivable land and high population-growth rates - such as Kenya, Ethiopia, Malawi, Burundi and Rwanda - fallow periods are no longer sufficient to allow soil fertility to be restored, so that crop yields have fallen. In response, farmers have been forced, either to bring increasingly marginal lands into cultivation, or to migrate into tropical forest areas, exacerbating problems of land degradation and deforestation (Nana-Sinkam, 1995).

Over-population, loss of fallow, Malawi

One of the causes of degradation is that population pressure is forcing farmers to cultivate increasingly marginal land. In Malawi, for instance, escarpment land that has a slope of more than 12% - and that should therefore be forested - is being cultivated, causing erosion, the flooding of fertile crop land below, and the siltation of stream beds and irrigation canals. Thus erosion is threatening the future of one of the few countries in Africa that was successfully feeding itself (Nana-Sinkam, 1995). Malawi is no longer feeding itself (see Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife).

5.9.4 Forest Losses Linked to Over-Population, Agricultural and Land Scarcity

As discussed, human population pressures and decreasing fallow are forcing poor people to expand cultivation into marginal and fragile areas. To survive, the landless are clearing forests, eking out a living on poor quality land or moving to the cities. Barbier (1998) found a positive correlation between rural population density and forest clearance across Africa, reflecting the critical role played by rural poverty combined with population growth in land degradation and conversion processes.

Forests cover approximately 33% of the world's land area, excluding Greenland and Antarctica. Recent estimates of forest coverage indicate that up to 50% of the world's original forest cover has been destroyed, and that deforestation continues to be a problem. The two principal land uses that contribute to the degradation of forestlands are commercial logging and land conversion to agriculture (GEF, 2002). Much of the “original” closed canopy forest cover⁷⁷ in Africa that is much of the forest loss appears to be in what is today called savanna or forested savanna (see Figure 5.1: African ecosystems). The loss of closed canopy forest would have been due to both anthropogenic changes and climatic changes from the gradual drying of the continent that began around 8,000 years ago. Humans would have accelerated this process (see Chapter 1, Section 1.7, BANTU AFRICA). Based on the resource maps provided by Revenga, *et al.* (1998), it would appear that the Sahelian and Sudano-Sahelian zones along with the southern tip of the African

⁷⁷ “This percentage was calculated by dividing the extent of current forest cover in square kilometers by the extent of original forest cover in square kilometers for each basin. Current forest refers to closed canopy forest in existence today. Original forest cover refers to an estimate of the extent of closed canopy forest in existence 8,000 years ago, assuming current climate conditions” (Revenga, *et al.*, 1998).

continent have less than 25% of their original closed canopy forests remaining, while that of the Congo Basin remains relatively intact.

5.9.4.1 Current forest cover, Sub-Saharan Africa

It is estimated that in the year 2000, forests covered about 27% of Sub-Saharan Africa or about 6.3 million km² in 2000 (Figure 5.1 and Tables 5.20 and 5.21) (FAO, 2000a & FAOSTAT, 2004). This estimation includes forested savannas such as the *Acacia* spp./*Combretum* spp. woodlands of West Africa, as well as the miombo (*Brachystegia* spp.) and mopane (*Colophospermum mopane*) forests of Southern Africa (Figure 5.1). The remainder include dense humid (lowland hardwood or tropical rain) forests (Figure 5.1), afromontane forests, mangrove forests, etc. Many of these forests are only conducive to sustainable agriculture based upon tree crops such as natural hardwoods, coffee and cacao, and wildlife along with “slash and burn” agriculture with long fallow periods.

Table 5.20: Sub-Saharan Africa forest cover in 2000

Country/area	Land area 000 Ha	Total forest 2000 Area 000 Ha	Total forest 2000 Percentage of land area
Africa South Of Sahara	2 306 626	628,157	27.2
Total Africa	2 978 394	649 866	21.8

Source: FAO (2000a), with permission, UN& FAO.

Table 5.21: Forest and woodland cover in Africa and Sub-Saharan Africa 1961-1994⁷⁸

Land Use Forests & Woodland (1,000 Ha)	Year						
	1961	1971	1981	1991	1992	1993	1994
Africa	735,015	731,528	726,767	714,950	713,778	713,554	712,676
Africa South of Sahara	715,589	710,831	705,188	693,226	692,232	690,863	690,006

Source: FAOSTAT (2004) with permission, UN & FAO.

Tropical Rain Forests/Dense Humid Forests

Tropical rain forests/dense humid forests in West Africa have been reduced to patches (FAO, 1995). More specifically,

“much of the West African tropical humid forests, located mainly in lowlands and accessible to the coast, have already undergone substantial commercial harvesting. In many areas, these forests have been converted to agricultural use. Nigeria and Cote d'Ivoire are cases in point. Most of the primary forests of these countries had been heavily logged by the 1970s. Expansion of agriculture onto forest lands has occurred in both countries: in the more densely populated Nigeria, clearing for subsistence agriculture has predominated, while in Cote d'Ivoire, large areas of forest have been replaced with agricultural plantation crops” (FAO 1995).

⁷⁸ Forests and Woodland: “Land under natural or planted stands of trees, whether productive or not. This category includes land from which forests have been cleared but that will be reforested in the foreseeable future, but it excludes woodland or forest used only for recreation purposes. The question of shrub land, savannah, etc. raises the same problem as in the category ‘Permanent meadows and pastures.’ In the year 1995 and onward there will be no data for this element, data relating to forest area can be obtained from the FAO Forest Resources Division...The dividing line between this category (Permanent meadows and pastures) and the category "Forests and woodland"; is rather indefinite, especially in the case of shrubs, savannah, etc., which may have been reported under either of these two categories” (FAOSTAT 2004).

Ivory Coast's 11.7 million ha (29 million acres) of forests were reduced to 1.4 million ha (3.4 million acres) by 1980 (Meredith, 2004). In 1995, only 0.46 million km² (463,240 km²/46 million ha) of "West Moist Africa" forests remained (FAO, 1995). "West African rainforests are already highly fragmented. The only large forest blocks remaining are in the border zone between Liberia and Ivory Coast. In Ghana, small remnant rainforest patches are restricted to protected areas" (WWF, 2001). "In West Africa, most of the dense humid forest has been converted to agriculture, causing a fragmentation of chimpanzee habitat" (Woods Hole, 2005).

"Except for the Congo Basin, Africa's frontier forests have largely been destroyed, primarily by loggers and by farmers clearing land for agriculture. In West Africa, nearly 90 percent of the original moist forest is gone, and what remains is heavily fragmented and degraded. Today, West African unspoiled forests are restricted to one patch in Côte d'Ivoire and another along the border between Nigeria and Cameroon" (Hennig, 2006).

Since most of the dense humid forest in West and East Africa has disappeared, this leaves about 2.0 million km² of dense humid forests primarily from the Congo Basin (Vande weghe, 2004) and about 3.8-4 million km² of savanna forests. This also assumes that the remaining afromontane forest make up less than 1% of total forest cover and have been virtually eliminated by agricultural expansion in Uganda, Kenya, Tanzania, Ethiopia, Rwanda and Burundi.

5.9.4.2 Original versus today's forest cover in Sub-Saharan Africa

The World Economic Forum (2004) depicts that Africa originally had about 6.7 million km² (670 million ha) in forest cover and today is left with about 2.1 million km² (210 million ha) or a net loss of 4.6 million km² (460 million ha). The 210 million ha forest cover for Africa compares to an estimate of 527.6 million ha in 1990 (FAO, 1993 *In: Barbier, 1998*) (Table 5.22) (appears to be

Sub-Saharan Africa plus Madagascar), 712.6 million ha in 1994 in Table 5.21 (FAOSTAT, 2004) and 649.9 million ha in 2000 (Table 5.20) (FAO, 2000a). However, the World Economic Forum estimate correlates well with the 2-2.5 million km² of dense humid forests, most of which are found in Central Africa's Congo Basin, as described by Vande weghe (2004), that remain after a combination of continental warming beginning about 8,000 years ago and the loss of dense humid forests between Cameroon and Guinea-Conakry largely depleted by humans. How does one define forest? It must be assumed that the World Economic Forum classified only closed canopy forests while ignoring the evolution of savanna forests that are included in FAO calculations.

Table 5.22: Forest cover loss in Africa, 1980–90

Geographic al Region	Number of Countries	Land Area (Million ha)	Forest Cover (Million ha)		Annual Deforestation 1980 to 1990	
			1980	1990	Million ha	% Per Annum
Africa	40	2,236.1	568.6	527.6	4.1	0.7
West Sahelian Africa	6	528.0	43.7	40.8	0.3	0.7
East Sahelian Africa	9	489.7	71.4	65.5	0.6	0.9
West Africa	8	203.8	61.5	55.6	0.6	1.0
Central Africa	6	398.3	215.5	204.1	1.1	0.5
Tropical Southern Africa	10	558.1	159.3	145.9	1.3	0.9
Insular Africa	1	58.2	17.1	15.8	0.1	0.8

Extracted From: FAO (1993) In: Barbier (1998), with permission UN & UN University.

5.9.4.3 Deforestation in Sub-Saharan Africa's dense humid forests today compared to the Amazon of South America

In Sub-Saharan Africa's tropical lowland hardwood forests (dense humid forests) of Central Africa most commercial logging is selective with one to two trees

harvested/ha, as opposed to South America where land is being clear-cut on a large scale for farming and livestock.

Comparing Deforestation in the Congo Basin to the Amazon Basin of South America

The Amazon supports approximately 300 million ha (3 million km²) of tropical forest (dense humid forests), the largest single area of tropical forest communities in the world (Camill, 1999). From one to three million ha (10-30,000 km²/year) are being cleared annually in the Amazon Basin (Laurence, 1997 In: Camill, 1999), or 0.3-1.0% of total forest cover. Similar to West African dense humid forests that have been heavily impacted by agricultural clearing, but unlike the Congo Basin, according to Ford (2005),⁷⁹

“there has been extensive change in land use from forest to non-forest cover in the Amazonian Basin, not only in Brazil, but also in Peru, Bolivia, and Ecuador, and to some degree Colombia. This has generally been for cattle ranching and agriculture. In the case of Brazil, subsidies were given for many years to promote cattle ranching, with the result that land use change was accelerated. Brazil has also supported development of roads through the Amazon and in other states for the purpose of supporting colonization of forested areas, in part to relieve stress of population growth. Road construction is also a subsidy for change in land use”⁸⁰.

⁷⁹ Dr. Loren B. Ford. - State and Private Forestry Program Coordinator, USDA Forest Service Strategic Planning & Resource Assessment Staff, 1621 N. Kent Street, Room 602, Arlington, VA. 22209. Former USAID Caribbean Regional Forestry Advisor/Biological Scientist, U.S. Government 22209, lbford@fs.fed.us, (703) 605-4478 fax (703) 605-4199.

⁸⁰ I don't have ready access to statistics, but I'm sure that a disgracefully small percentage of the timber that is felled during conversion from forest to non-forest land use (in the Amazon) is actually put to good use for buildings or other products. The branches and smaller trunks are burned, and the larger trunks (which are too large to efficiently burn) slowly rot, with grazing and cropping carried out among the logs. Agricultural settlers use different species for specific purposes, poles and pit-sawn lumber for home and out-building construction, palms for thatch, etc. In some cases, logging concessions are granted (in all of these countries), but in the vast majority of these cases only the most valuable species are actually logged (such as mahogany, Spanish cedar, and a few other species), while poorly planned logging damages much of the

A recent study in the top five timber producing states of the Brazilian Amazon using satellite imagery indicates that selective logging adds 60⁸¹ to 123% ⁸² more forest area damage/year than has been reported for deforestation alone, while nearly doubling the amount of forest impacted by humans over a three year period

remaining forest cover. The companies granted the concessions (frequently through corruption-affected practices) seldom have a long-term interest in management under which they would benefit from better-planned logging and measures to improve the forest stand for future harvests. The roads used to extract the timber are then used by agricultural colonists, who actually carry out the conversion in land use. Without these farmers, forest would always return, although not necessary with the same distribution of species. Mining and petrochemical exploration and development also create roads, with the same effect. Workers in these extractive industries harvest game animals for personal consumption in their field camps and capture animals for illegal sale to the international pet trade, usually with an extremely high mortality of animals because of inadequate handling" (Ford, 2005.).

de Haan, et al. (1997) estimate that once forest is converted to pasture in the Amazon Basin, these pastures last no more than 10 years, their productivity being significantly reduced from loss of soils and nutrients. There are between 20 and 35 million ha of abandoned pasture in the Amazon basin (Serrao & Toledo, 1990 *In:* Cajas-Giron, Jones & Sinclair, 2002). The other major cause for deforestation is imported "slash and burn" agriculture, with three years of farming and then often abandonment, soils being similar to many of those in Sub-Saharan Africa, with "highly weathered aluminum and iron oxide clays that are acidic and deficient in plant nutrients, especially phosphorus. Tropical ecosystems are adapted to nutrient-poor soils as evidenced by the relatively large fraction of ecosystem nutrients stored in vegetation (compared to soils) and widespread plant adaptations like evergreen leaves that conserve nutrient loss (Vitousek & Sanford, 1986 *In:* Camill, 1999)...Cattle numbers decline from an average of two healthy head/ha following clearing to less than 0.3 head/ha 20 years following clearing (Serrão and Homma 1993 *In:* Camill, 1999). After just two years of grazing, some cattle exhibited 20% mortality and complete reproductive failure due to a lack of phosphorus in pasture grasses (Buschbacher, 1987 *In:* Camill, 1999)...land grabbing followed the appropriation of the Amazon frontier, leading to many bloody clashes between cattle owners and peasant farmers. A recent estimate suggested that of the 4 million residents of the Amazon, 150,000 or 4% are forcibly evicted from their land each year (Hall, 1989 *In:* Camill, 1999). From the perspective of cattle ranching, it is cheaper to appropriate pasture by the forced removal of farmers than to clear forest" (Camill, 1999). Of course, this pushes the evicted residents to clear more forests in order to survive. Logging tends to be selective, but appears to be unsustainable. Oversupplies of beef and timber from the Amazon Basin have led to price deflation and debt with banks in industrialized nations, exacerbating timber exports (Camill, 1999). Likewise, Mongabay (2005) gives an example of how devaluation of Brazil's currency, which would likely have been part of an IMF/World Bank structural adjustment program, increased exports of beef from Brazil from 40-70% between 1990 and 2001. By 2003 for the first time, growth in cattle production was largely export driven and which 80% of this came from the Amazon Basin – thus exasperating deforestation.

⁸¹ 12,075 km²/year selective logged versus 19,963 km²/year deforested from 2001-2002.

⁸² 19,823 km²/year selective logged versus 16,112 km²/year deforested 1999-2000.

from 1999-2002 from 52,253 km² for deforestation alone to 98,403 km² when selective logging is taken into account (Asner, Knapp, Broadbent, Oliveira, Keller & Silva, 2005). The environmental and social impacts of selective logging would likely be similar to those described in the Congo Basin in this chapter and in Chapter 11. The next step will be to determine how widespread this is throughout the Amazon Basin.

Retaining Structural Integrity While Losing Biodiversity in the Congo Basin From Logging

Presently, Sub-Saharan Africa's dense humid forests of Central Africa may not be as structurally endangered as in the Amazon Basin of South America but, as is discussed elsewhere, biodiversity is threatened by logging practices and the related bushmeat trade [Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks and Protected Areas and Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)]. Forest fragmentation by logging roads is a major problem, allowing easy penetration by outsiders, with the net result that bushmeat and other non-timber resources are being mined for short-term gain, even though the forest remains essentially intact. When logging roads are overlain, on the dense humid forests of the Congo Basin (Central African Republic, Congo, Democratic Republic of Congo, Cameroon, Equatorial Guinea, and Gabon) large unfragmented blocks of forest decline from 83% to 49%, with 42% of forest area in the six countries within 10 km of a road and more than 90% within 50 km of a road. "Only 7% of forest area is closer than 1 km or further than 50 km from a road" (WRI, 2000).

"In Sub-Saharan Africa, crop production, and especially the expansion of permanent plantation crops, such as oil palm and rubber, have been major causes of deforestation (in

dense humid forests). Very little tropical rainforest (dense humid forests) has been converted into ranches (e.g., as in South America) on this continent” (Sharma, Rietbergen, Heimo & Patel., 1993 *In: de Haan, et al., 1997*) (Table 5.23).

Sharma *et al.* (1993 *In: de Haan, et al., 1997*) argue that over-exploitation of forests and logging roads contribute to deforestation by allowing access by itinerant farmers. The principal author has not seen this in Southeastern Cameroon nor in adjacent Congo Brazzaville. During the colonial times, villagers were moved along the edges of the main roads, a policy known as *regroupement* (see Chapter 3, Section 3.1, COLONIAL STATE IN AFRICA and Chapter 5, Section 5.9.3.5, Decreased fallow associated with over-population, decreased mobility and land use changes, Sangha Basin, French Equatorial Africa). Most people are not going to go further from their village than would enable them to farm during the day and return by nightfall (Biko'o, *pers. comm.*).

**Table 5.23: Some estimates of the main causes of deforestation
(percent of total deforestation)**

Region	Crops	Livestock	Forest exploitation
South America	25	44 (70 in Brazil)	10
Asia	50-60	Negligible (Philippines and Indonesia to some extent)	20
Africa	70	Negligible	20

Source: Bruenig (1991 *In: de Haan, et al., 1997*) with permission, UN& FAO.

With more than half the population living in urban centers (30-80% depending on the country) and low human population densities in Central Africa's dense humid forest massif (Congo Basin) of less than two inhabitants/km², “slash and burn” agriculture still represents a danger to these forests (Vande weghe, 2004).

NASA (1996) estimates a total of dense humid forest of 1.7 million km² in Central Africa at the end of 1985, with a loss of at 350,000 ha/year from the end of 1980 until the end of 1985, basically in the Congo Basin.⁸³ The approximately 2 million km² (Vande weghe, 2004; Musa, 2006) of Central Africa's dense humid forests (Congo Basin) in 2004 are between 67-75% of what they were 8,000 years ago (2.7-3.0 million km²), and are experiencing a rate of deforestation averaging 0.35%/year (7,000 km² or 700,000 ha/year) (Vande weghe, 2004) up to 1.5 million ha/year (Musa, 2006). Nadine Laporte, of the Woods Hole Research Centre in Falmouth, Massachusetts, estimates that 30% (1.3 million ha) of the more than 3.9 million km² of the Congo Basin are being logged (Connor, 2007), while from 6% (Wilkie, Carpenter & Zhang, 2001) to 12% (Connor, 2007) are protected. This deforestation is serious but on the order of 1.4 to 4 times less than the maximum area cleared/year of Amazon Basin forests. WWF estimates that 66% of the Congo Basin could disappear (maybe better to say become degraded) within the next 50 years from logging and mineral exploration (Musa, 2006).

Interestingly enough, Vande weghe (2004) argues that given the Congo Basin's current low human densities in the dense humid forest massif, "slash and burn" agriculture may be one of the few areas in Sub-Saharan Africa that is both sustainable and good for biodiversity, creating mosaics of landscapes. Similarly, Chapter 11 (see Section 11.11.4.3, Impacts on Bwindi's natural system from excluding people) discusses the positive role man's manipulation of forests can play, creating gorilla habitat in the afromontane forests of Bwindi, Uganda. However, given today's human populations and the pressure for resources, regardless of lowland or afromontane forests, more intensive management will be required, implying controlled access, to assure sustainable exploitation of these resources. Given the dependence of rural Africans on these resources, trying to exclude them as a means of conserving biodiversity through parks and hunting

⁸³ From Cameroon, CAR, Congo Brazzaville, Equatorial Guinea, Gabon, DRC (Zaire) and Angola

blocks risks creating poverty and may result in clandestine harvesting and thus loss of an ability to manage them on a sustained yield scientific basis.

Revenga, *et al.* (1998) estimates that the Congo Basin has lost more than 1 million km² of original forest cover compared to 8,000 years ago. de Vos (1975) also estimates that closed tropical forests in Africa have shrunk by at least 100 million ha (1 million km²). In some cases, loss can also mean degraded secondary forests from “slash and burn”, charcoal production, unsustainable logging, etc. Between 8,000 and 6,000 years ago (BP) the dense humid forests of Central Africa reached their maximum area, but 2,500 to 2,000 years ago they were much less than today corresponding to a world-wide climatological phenomenon (low rainfall period) (Vande weghe, 2004) indicating an expansion and shrinking of the forests linked to climate. Given modern man’s impact on the environment (e.g., declining fallow periods, reduced soil fertility, expansion onto new lands) with populations more than doubling in 50 years, one must ask if the Congo Basin’s forests will ever expand again in the presence of man unless lifestyles change.

5.9.4.4 Population, Commercial Maize and Forest Loss in Ghana, 1908-1996

Due to concern over the loss of forest, by 1939, 1.5 million ha or 20% of the land in the moist forest zone was placed under government protection as forest reserves. Much of this conversion was due to movement away from cocoa to maize (see Chapter 12, Section 12.4.4.2, Impacts of structural adjustment on peasant production systems, Impacts of structural adjustment on central Ghana cash crop economies, fallow and virgin forests). McCann (1999) believes that the World Bank and others have made a major error in estimating a loss of 75,000 ha/year of forest since 1900, with the assumption that these forest reserves were primary forests when in fact: 1) many were secondary forests, former oil palm fields or canopy-covered cocoa estates, and 2) populations declined or dispersed

from this area in the mid-19th century leaving many formerly cultivated fields and settlements to regenerate into secondary forests (Fairhead & Leach, 1996 *In: McCann, 1999*). In 2004/2005, with the massive displacement of people from the Sahel to coastal countries and the apparent reduction in fallow across this region, is this still the case?

5.9.4.5 Deforestation in the Ivory Coast

The cost of growing cocoa, coffee, palm oil and bananas, uncontrolled logging, along with the large influx of immigrants from the Sahel has been massive deforestation. Hardwood forests, which covered 70% of the country in 1900, by 1986 had been reduced to 5% of the territory (Rosenblum & Williamson, 1987). The tropical forest area in Ghana, the Ivory Coast, Liberia, Guinea-Conakry, and Sierra Leone has been reduced originally (around the year 1900) from 313,000 km² to 87,000 km² (in the 1980s) (Parren & De Graaf, 1995 *In: Lycklama à Nijeholt, et al, 2001*) compared to an estimated 463,240 km² of “West Moist Africa” forests remaining in 1995 (FAO, 1995) that may also include forests in Guinea-Bissau, The Gambia, southern Senegal, Togo, Benin, Nigeria and southwestern Cameroon (see Section 5.9.4.1, Current forest cover, Sub-Saharan Africa).

5.9.4.6 Deforestation in afromontane forests

“To compensate for the falling yields caused by soil erosion, farmers in the highlands of Sub-Saharan Africa have cleared forests on steeper slopes, accelerating land degradation in the process. With population growing at around 3% a year, and the population density in some of the most vulnerable rural areas increasing even faster, the dangers posed by this cycle of increasing poverty, deforestation, and accelerating land degradation are readily apparent” (Nana-Sinkam, 1995).

The afromontane forests [e.g., Rwanda, Burundi, eastern DRC and western Uganda (Albertine Rift); Tanzania, Kenya, Ethiopia, and the highlands of Cameroon] are also being impacted by agricultural expansion. However, much of this deforestation occurred prior to the arrival of the Europeans (see Chapter 2, Section 2.3.4.2, Traditional irrigated agriculture). By the time the first Europeans arrived in Rwanda and Burundi, 90% of the forests were already gone, while in the highlands of Cameroon (e.g., Bamileke Plateau and Adamoua Plateau) grass fields had largely replaced forests 2,000 to 3,000 years ago (BP) (1,000 BC to 0 A.D.), one of the reasons for the Bantu migrations (Chapter 1, Section 1.7, BANTU AFRICA). Today in the uplands of Rwanda, Burundi and Uganda no more than 5% of the original forest cover remains and no tract exceeds 100,000 ha, yet they manage to preserve 90% of the original biodiversity (Vande weghe, 2004).

Over-Population, Land Degradation and Hunger Linked to Deforestation for Agriculture in the Highlands of East Africa

“Kenya has 8.5% of its original forest cover, Tanzania between 22-43% (depending on whether miombo woodland is included), and Uganda 7.2%. The countries continue to lose their forest cover at a rate of 1.7% per annum (Kenya), 1.3% for Uganda, and 0.3% for Tanzania (FAO, 1997c *In:* Barrow, *et al.*, 2000). As human populations in high potential agriculture areas grow, the frontiers of cultivation have been pushed into forests, river valleys, and semi-arid areas” (Barrow, *et al.*, 2000).

For instance, in 1998, a total of 113,400 people lived in 54 villages of the East Usambara Mountains of Tanzania. Since the 19th century, over 50% of the forest of the East Usambara Mountains has been cleared for commercial crops (coffee and tea), commercial and individual logging, forestry plantations and agriculture. Fragmentation has resulted in just eight major patches of forest remaining (Roe, Mulliken, Milledge, Mremi, Mosha, & Grieg-Gran, 2002). If the reader goes

back to Chapter 2, it becomes evident that many of the Tanzanian highlands were already suffering from over-population in pre-colonial times.

Deforestation in the Ethiopian Highlands

Due to the farming of steep slopes, it is estimated that the Ethiopian Highlands lose 62 tons/ha/year (25 tons/acre/year) of top soil. Since 1900, it is estimated that forest cover has decreased from 50% of the highlands to just 3% (Rosenblum & Williamson, 1987), jeopardizing such unique species as the mountain nyala (*Tragelaphus buxtoni*) and the simian fox (*Canis [Simenia] simensis*).

Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Fuelwood Spawning Political Destabilization

“In 1950, Rwanda’s population was 1.9 million. By 1994, it was nearly 8 million, making it the most densely populated country in Africa. As populations grew, so did the demand for firewood. By 1989, almost half of Rwanda’s cultivated land was on slopes of 10 to 35 degrees, land that is universally considered uncultivable. By 1991, the (fuelwood) demand was more than double the sustainable yield of local forests. As a result, trees disappeared, forcing people to use straw and other crop residues for cooking fuel. With less organic matter in the soil, land fertility declined” (Brown, 2003a).

Mair (1977) came to similar conclusions, namely that

“one reason for the revolution in Rwanda seems to be that the Hutu were short of land for cultivation because so much was taken for grazing of Tusi (Tutsi) cattle. It may be that Tusi have suffered less than the peoples of Uganda from epidemics of rinderpest which have decimated the herds from time to time”.

Ninety-five percent (95%) of the land was under cultivation with the average family of eight living as subsistence farmers on less than 0.02 ha (0.05 acres) (Gourevitch, 1998).

“As the health of the land deteriorated, so did that of the people dependent on it. Eventually there was simply not enough food to go around. A quiet desperation developed among the people. Like a drought-afflicted countryside, it could be ignited with a single match. That match was the crash of a plane on April 6, 1994, shot down as it approached the capital of Kigali, killing President Juvénal Habyarimana. The crash unleashed an organized attack by Hutus, leading to an estimated 800,000 deaths, mostly of Tutsis. In the villages, whole families were slaughtered lest there be survivors to claim the family plot of land. Deaths were concentrated in communities where caloric intake was the lowest” (Brown, 2003a).

Population pressure contributed to the tensions and the slaughter, although it was by no means the only factor (Brown, 2003a). Gasana (2002, *In: Matthew, Halle & Switzer, 2002*) goes into great detail in explaining how population pressures and environmental scarcities (e.g., land and firewood) combined with drought, famine and civil war fueled the 1994 genocide. As Rwanda’s population increased, inherited land became increasingly fragmented as each generation subdivided that which was passed on from the previous generation to the point that a family landholding was incapable of supporting a family unit (husband, wife and children), resulting in near-landless or landless farmers. Based on a 1984 survey (Gasana, 2002 *In: Matthew, et. al., 2002*):

- 43% of the poorer families, *abakene*, owned only 15% of the cultivated land, averaging 0.25-0.75 ha/family;
- 50% of rural families had to rent land to meet subsistence needs;
- 16% of “*land-rich*” families, *abakire*, owned 40% of the cultivated land, a family landholding averaging 1 ha; and

- By 1989, 50% of the cultivated soils were on slopes greater than 18% that experienced continual soil erosion and thus decreasing production. The other movement was movement onto good pasture lands that became marginal agricultural lands, reducing available grazing lands from 34% of the territory in 1965 to 16% by 1987, increasing livestock densities and over-grazing on the remaining pasture. These *abatindi* were basically landless, with no education skills or jobs, and were pushed to cultivating marginal, rocky and often acidic soils, best managed as natural forest or cultivated in tea, as opposed to intensive cropping. Similar to the *tapades* in Guinea-Conakry (Section 5.9.3.2, Loss of fallow turning wildlife into a short-term resource, Fouta Djallon Mountains, Guinea-Conakry), only highly manured gardens around the homesteads were productive.

By 1984, approximately 15% of the land-owners owned half of the land, tending to be urban elite in commerce, government, or the aid industry, rather than full-time agriculture. By 1990, 25% of the rural population was landless, increasing to 50% in some districts. Also land was/is highly fragmented, the average Rwandan household possessing 5 plots, increasing to as many as 10 plots/household in Ruhengeri (Musahara & Huggins, 2005 *In: ACTS*, 2005).

As a result, 66% of the population was unable to meet the minimum energy requirements of 2,100 calories/person/day⁸⁴ and rural unemployment among adults reached 30%. This unequal access to the best land had been linked to political power and nepotism since the 1970s. These political elites, both Hutu and Tutsi, known as *abary* (*eaters*) initially caused the issue to be seen as rich versus poor, along with an agriculturally richer north/agriculturally poorer south highlands divide, and not Hutu versus Tutsi. These elites even used poverty as a resource, capturing foreign aid and directing it to their region and/or putting

⁸⁴ Other references use from 1,730-1,900 calories/person/day or less as indicating undernourishment in Sub-Saharan Africa

people from their group in charge (Gasana, 2002 *In: Matthew, et. al., 2002*). All of this was compounded by a shortage of firewood resulting in an estimated 8,000 ha (80 km²) of forest/year disappearing, which in turn forced farmers to use crop residues for fuelwood resulting in a loss of 1.7 tons of organic matter/ha/year. This greatly contributed to the loss of soil fertility, an equivalent loss of 65,000 tons/year of cereals (Gasana, 2002 *In: Matthew, et. al., 2002*).

By 1994, with a population of 7.5 million people, there were 290 inhabitants/km² and 843 inhabitants/km² of arable land (11,250 km² or 43% of the territory) (Gasana, 2002 *In: Matthew, et. al., 2002*). In 2005, there are 350 inhabitants/km² (Musahara & Huggins, 2005 *In: ACTS, 2005*). Diamond (2005a) places Rwanda's population density at 293/km² (760/mi²), higher than the United Kingdom of 236 inhabitants/km² and approaching that of Holland at 367 inhabitants/km².

A big difference between Rwanda and the United Kingdom/Holland is that most of Rwanda's population lives a rural subsistence lifestyle, while those of the United Kingdom and Holland are highly urbanized and industrialized. The biophysical carrying capacity of Rwanda was estimated at 5,240,000 people with 2,360,000 of its nearly 8 million people living in a situation of permanent food insecurity. This was resulting in reduced fallow and people moving up mountainous slopes on increasingly marginal land (Gasana, 2002 *In: Matthew, et. al., 2002 & Musahara & Huggins, 2005 In: ACTS, 2005*). "The resulting degradation of the ecological capital forced rural inhabitants into a vicious cycle of poverty" and thus caused friction between the haves and have-nots (Gasana, 2002 *In: Matthew, et. al., 2002*). Diamond (2005a) estimates that all arable land outside national parks was being cultivated, the entire country looking like a garden and banana plantation, with little or no soil conservation measures being implemented (e.g., terracing, plowing along contour lines instead of straight up

and down, fallow cover vegetation between fields instead of bare fields). Farmers could wake up in the morning and find their entire field of top soil and crops washed away or their neighbors field and rocks being washed down on their fields. Deforestation resulted in water-holding capacity declining and streams drying up.

“Given the current major problem of land scarcity in Rwanda, strong and urgent programs for population growth control, off-farm activities, and agriculture intensification should be introduced, nationwide, so that even the elite can learn to look for other opportunities of gaining wealth other than just grabbing and purchasing land” Kairaba-Kyambadde, 2005 *In: ACTS, 2005*).

The 2001 Poverty Reduction Strategy Paper (PRSP) addresses the land issue recommending 1) households consolidate plots so each holding is not less than 1 ha, 2) ceiling of 50 ha on land ownership, 3) all land registered to improve tenure security; 4) land titles tradable, but not in a way that fragments plots below 1 ha, and 5) communities involved in the process of allocating title (Musahara & Huggins, 2005 *In: ACTS, 2005*).

How the political elite used resource scarcity, poverty and unemployment to fuel the Rwandan genocide, which in turn played into the geopolitical power struggle between France and the United States, is discussed in Chapter 13, Section 13.8.6, Former Cold War allies vying for power in the Great Lakes Region.

Neighboring Kivu Province, DRC

This province was mainly settled by Tutsi and Hutu collectively called Banyarwanda, who arrived before the colonial era (Gasana, 2002 *In: Matthew, et. al., 2002*). Prior to colonialism, land was regulated by a hierarchical administration based on communal territorial ownership. The Belgian colonial

power pushed indigenous systems of land tenure into a new regime of customary law that “containerized” the local population. This involved the “rigidification” and in some cases a re-definition of ethnic identities and a codification of customs in addition to creating a double system of property rights; customary for local people and a modern system of private ownership by white settlers that enabled them to establish their plantations, through application to the central state. “Vacant land” was declared the property of the colonial state and expropriated for settler-owned concessions with compensation being paid to the customary leaders (*mwami*), rather than to the people. By about 1910, colonialism defined and accentuated differences between ethnic groups and their rights of access to land (e.g., Kinyarwanda speaking people considered indigenous and given customary authority over land, disputed by Banyarwanda immigrants that were mainly of Tutsi-origin (Vlassenroot & Huggins, 2005 *In: ACTS*, 2005).

Even prior to the 1994 exodus, this province was fertile but densely populated. By the end of the 1980s, 49% of the population in Kivu lived in areas with a density higher than 100 people/km², this density of people covering no more than 13.4% of DRC’s territory as a whole (Vlassenroot & Huggins, 2005 *In: ACTS*, 2005). Land tenure was a major issue.

The land rich and politically powerful Banyarwanda were pitted against an alliance of Hunde, Nande and Nyanga ethnic groups. Vlassenroot & Huggins (2005 *In: ACTS*, 2005) attribute this problem to conflict between customary law and modern law based upon individual ownership introduced in 1973 by the independent Zairian state (today’s DRC). Banyarwanda, who had purchased land with a title deed from traditional authorities refused to pay tribute to Hunde chiefs for the use of the land, while customary rules no longer had legal status. Meanwhile the average peasant became insecure over his rights of access to customary land. In North Kivu, poor Hutu farmers from Masisi had lost their land

from sale by local customary chiefs to rural capitalists of Banyarwanda origin (Vlassenroot & Huggins, 2005 *In: ACTS*, 2005). By 1993, inequitable land distribution led to ethnic clashes targeting the Banyarwanda resulting in more than 6,000 deaths and the displacement of 250,000 people (Gasana, 2002 *In: Matthew, et. al.*, 2002).

When the Rwandan Patriotic Front (RPF) of Paul Kagame defeated the Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR) on July 19, 1994, 2 million Hutu refugees fled to neighboring countries; between 1.2 million (Gasana, 2002 *In: Matthew, et. al.*, 2002) and 1.5 million (Chrétien, 2003) Hutu fleeing to northern Kivu Province, DRC.

The 1994 Hutu refugees allied themselves against the Banyarwanda Tutsi. Eventually the Hunde feared this massive number of Hutu could result in their taking political control and in the creation of a Hutu state. Competition for political influence in Kinshasa fomented animosity between indigenous groups and the Banyarwanda, resulting in thousands of deaths and the displacement of 200,000 people. Eventually under Laurent Kabil, there was a new reshuffling of alliances between the Hunde, Nande, Nyanga and Hutu, forcing the Tutsi to flee to the town of Goma and to Rwanda (see Chapter 13, Section 13.8.6.9, the French connection). More recently, land disputes developed between pastoralist Hema and Lendu peasants. Land resource conflicts in the eastern DRC, help sustain conflict in the region (Gasana, 2002 *In: Matthew, et. al.*, 2002). Conflict rages on in the southern Kivu Province and will likely not cease anytime soon.

There are four lessons that can be learned from this tragic chapter in Africa's history:

- 1) "rapid population growth is the major driving force behind the vicious circle of environmental scarcities and rural poverty (and

conflict), 2) conserving the environment is essential for long-term poverty reduction, 3) to break the links between environmental scarcities and conflict, win-win solutions—providing all sociological groups with access to natural resources—are essential, and 4) preventing conflicts of the kind that ravaged Rwanda in 1994 will require a rethinking of what national security really means” (Brown, 2003a).

These same four points are also made in Gasana (2002 *In: Matthew, et. al.*, 2002). The authors believe that a combination of introducing modern intensive farming and soil conservation measures combined with alternative livelihoods mainly in urban centers as a means of taking pressure off the land and resource base are keys to future stability and food security in Sub-Saharan Africa. Meanwhile, what little forest is left, will continue to disappear at an accelerated pace.

5.9.4.7 Deforestation in savanna environments

One must first get a hand on what is savanna. By the above calculations (Section 5.9.4.1, Current forest cover, Sub-Saharan Africa), only 17-18% of Sub-Saharan Africa would be savanna,⁸⁵ compared to the 70-75% figure that is typically used. One major problem is defining forest, for example including or discounting secondary bush from fallow agriculture or various forested savannas. Estimates vary widely on the loss of forest cover in Sub-Saharan Africa, depending on what is classified as a forest. For instance, depending on whether forested savanna is classified as forest or savanna can account for these wide variations in estimates of forest cover.

⁸⁵ If the majority of dense humid forest cover remaining is in the Congo Basin, amounting to about 2 million km², and the amount of afromontane (largely lost to agriculture) and coastal forests (e.g., mangrove) is insignificant then about 4 million km² of forest remain which would be classified as savanna, this making up about 18% (≈ 4 million km² of savanna $\div \approx 22$ million km² of land mass in Sub-Saharan Africa) of the land cover in Sub-Saharan Africa.

FAO, for example, takes into account savanna forests in its definition of forest

“a land area of more than 0.5 ha, with a tree canopy cover of more than 10%, which is not primarily under agricultural or other specific non-forest land use. In the case of young forests or regions where tree growth is climatically suppressed, the trees should be capable of reaching a height of 5 m *in situ*, and of meeting the canopy cover requirement” (CBD, 2004).

Whereas, Scholes, 1997 *In: Cowling, et al.*, 1997 define savannas as having tree cover from 5-90%. For this reason, one obtains widely varying estimates of savanna in Sub-Saharan Africa from 33% (Martin & O’Meara, 1995) to 75% Child (1995; 2004b both *In: Child, 2004a*) of the landmass. Today a large portion of the “savanna” environment/biome is under agricultural production and/or in fallow, with fallow on the decline. Where fallow occurs, it would revert to bush and could easily be classified as savannah habitat. Nevertheless, savannah, in the broadest sense when using the term 70-75% would have to include land in savannah and land in agriculture that would otherwise be a savannah environment were it not for man’s interventions. The savannah environment/biome might best be delimited by rainfall, below which intensive agriculture is not viable, somewhere between 30° North and South (a line across Africa from about Durban to Cairo) where annual rainfall is somewhere below 800 mm (Dumont, 1966) to below 700 mm (Bond, *et al.*, 2004 *In: Child, 2004*), but greater than 200 mm (see Chapter 1, Figure 1.3: The Sahel). Even some desert environments (rainfall below 200 mm/year) might be considered savanna depending on tree cover (see Section 5.1, INTRODUCTION).

It is believed that the majority of deforestation today is thus taking place in Africa’s savanna areas. With increasing human populations in Sub-Saharan Africa and greatly reduced and/or disappearing fallow periods, much of the deforestation in Sub-Saharan Africa can be attributed to agriculture, i.e., from expansion of

farmers into more and more marginal areas and to decreasing secondary forests that in the past came from fallow lands and served as a source of energy and other resources (e.g. honey, bushmeat, medicine) for rural people.

The destruction of forests, especially forested savannas is exacerbated as fallow disappears and urban demand for charcoal increases. Once cut over, today these areas rarely return to forests, and are permanently converted into farm and grazing land (Figure 5.10) (see Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal linked to charcoal making, over-population and declining fallow periods). “Asia and Africa together consume more than three-quarters (75%) of global fuelwood, mostly in domestic cooking, though cottage industries such as food drying and brick-making also consume large volumes in some countries” (FAO, 2002a). Although Africans consume 30 times less energy than North Americans do, an estimated 67% of Sub-Saharan Africa’s energy consumption depends upon traditional biomass (e.g., firewood, charcoal, manure, crop residue). Linked to clearing for agricultural purposes, deforestation is a major cause of environmental degradation such as soil erosion, floods and general habitat/environmental degradation (Davidson, Halsnaes, Hug, Kok, Metz, Sokona & Verhagen, 2003).

Loss of Forest Land in Zimbabwe from Inequitable Land Distribution and Resulting Population Pressures, the Case of Matabeleland North Province

The history of colonialization is the inequitable distribution of land between Africans and European settlers. Increased human populations, the resulting land hunger and these events as the basis for and leading to the 1970s liberation war in Zimbabwe are discussed in Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife. As noted, communal lands tend to be located in the lowest rainfall areas with the poorest

soils for agriculture, Regions IV and V where 75% of the communal lands are located. In comparison, 55% of the white commercial farms are found in Regions I and III with good soils and rainfall (Hill & Katarere 2002 *In: Matthew, et al.*, 2002). Meredith (2002) places 66% of the white commercial farms in Regions I and II, and 72.2% of the communal lands in Regions III and IV. While Wels (2000) places 75 and 66%, respectively of the land in Regions I and II in white commercial farm, and 74.2% of the communal lands in Regions III and IV, prior to radical land reform.

Inequitable land distribution forced people in communal areas to subsist through over-exploitation of resources, leading to resource degradation and livelihood insecurity. Hill and Katarere (2002 *In: Matthew, et al.*, 2002) discuss how these factors have contributed to pressure on communities to clear woodlands for short-term food production. The primary cause of deforestation in Zimbabwe is clearing land for agriculture (World Bank, 1991 *In: Hill & Katarere*, 2002). State forests were first established in 1936 and then expanded in 1941. The 1970s civil war resulted in a complete breakdown in forest administration, furthering resource depletion and illegal settlements in both forests and under-utilized commercial farms.

Even with the newly founded independence, local people were officially excluded from the forests, as opposed to being integrated into their management. Additionally, the black urban elite sought grazing leases and timber concessions in the state forests. By 1987, when the government and the Ndebele ended hostilities, the Forestry Commission attempted to re-establish management of the forests, but was unable to stem the inflow of settlers. The Forestry Commission was expected to break the white monopoly on hunting and tourism in the area, but instead has come to be seen as an extension of oppressive central government and therefore not trustworthy. Today, what had started as a national conflict against

colonial powers has turned into a conflict based on ideological and political differences, raising concerns about future economic, social and political relations between the minority Ndebele and the ruling Shona majority. Thus, the conflicts around the forest reserves have come to symbolize a broader struggle by the Ndebele against the establishment. Any attempt to evict people from the forests or to stop them from using forest resources is now seen as a direct challenge to legitimate claims by the Ndebele to use “their” resources. Forestry officials have dealt with this very complex socio-political issue purely in a legal and technical sense (Hill & Katarere 2002 *In: Matthew, et al.*, 2002), and appear to have failed to integrate the local people into the management of the area. Thus, the conflict continues and forest resources appear to be harvested in an unmanaged “open-access” manner, which risks to see them degraded in a very short time, if not disappear under the plough!

Deforestation in Senegal Linked to Charcoal Making, Over-Population and Declining Fallow Periods

During the Cold War, both the Americans and the French allegedly paid funds directly to the Government of Senegal to help cover the salaries of *functionaries* as well as to subsidize peanuts. This created the façade of a vibrant economy. Living off donor handouts allowed elites to mine Senegal’s forest resources for short-term economic gain. Local communities had been alienated since colonial times with the creation of off limits classified forests (*forêts classés*) that were still being enforced under a “fences and fines” philosophy 20 odd years after independence.

In many areas, farmers turned their backs on what they perceived as a “government’s problem” as illegal Guinean charcoal cutters clear-cut the interior of government “classified forests” while leaving a perimeter of trees untouched so

that such activities would go undetected by the understaffed *Eaux et Forêts* (forest and game department).

While local people were told that the forests were off limits, poorly paid employees from understaffed and inefficient *Eaux et Forêts*, for a cut of the action, gave cutting permits to influential businessmen, politicians or religious leaders to clear the very forests that were off-limits to local communities (see Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal). Many of these charcoal cutters began their careers in the Ferlo of central Senegal and at the time of the study, in the mid-1980s, were near the Gambian border south of Tambacounda. They were often linked to politically connected outsiders who obtained legal cutting permits.

It was estimated that 20,000 ha/year were being clear cut for charcoal⁸⁶ in the Gambia River Basin along the Koungheul/Koussanar/Tambacounda/Velingara transect with little attempt at reforestation or natural forest management (Ribot, *pers. comm. In: DeGeorges, 1987*).

Most of this charcoal was destined for the urban centers. Attempts to get people to switch from charcoal to natural gas for cooking generally failed, especially for making *thé Senegalais* the local “Chinese Gunpowder Green” tea that people believed only tasted good cooked over charcoal. Charcoal permitted them to spend hours making the tea, as opposed to gas which would be quicker but more expensive⁸⁷ and which people believed made the tea less palatable. Drinking tea is all about conversation and philosophical discussions, an important part of the

⁸⁶ Diamond (2005a) estimates a 4 to 1 ratio by weight in conversion of wood to charcoal.

⁸⁷ It can take hours to drink three cups of tea, the goal being dialogue as much as drinking. This would require enormous amounts of gas over two to three hours.

Senegalese oral culture, which cannot be ignored in getting them to adopt technologies.

Once an area was cut, small-scale farmers and livestock moved in, which meant the end of the bush. This can be linked to increased human populations and the loss of fallow pushing people into marginal areas. Hunting in these forests was common, with no one having a license. Sadly, these dry savanna forests could have been sustainably managed through rotational management and coppicing (see Chapter 9, Section 9.8.9.2, Communal natural forest management, Guesselbodi, Niger and 9.8.9.3, Community based natural forest management, “*Gestion des Terroirs*”, Burkina Faso).

An endless cycle of conflict is also being created as farmers use agricultural residue for fuel. This residue is thus no longer available as fodder for livestock in the dry season that in turn would help fertilize the land in the form of green or cow manure. Likewise, with decreasing fallow, farmers are moving onto rainy and dry season grazing areas of pastoralists resulting in a band of friction across much of the Sub-Saharan Africa as these two lifestyles collide, especially along the Sahel from Senegal to Darfur in Sudan (see Section 5.11, CONFLICT LINKED TO OVER-POPULATION AND DESERTIFICATION – SCARCE RESOURCES). Therefore, just about all causes of soil degradation and deforestation (Table 5.7) can be linked to traditional agricultural practices that are no longer viable at the beginning of the 21st century.

5.9.4.8 Carbon dioxide production and sink linked to Sub-Saharan African forests

Meanwhile, the release of carbon dioxide (CO₂) into the atmosphere from burning fuelwood and charcoal, the major source of energy for most Africans, contributes

to global warming and contributes to an important loss of biodiversity (Reich, *et al.*, 2001). However, globally, the African continent contributes less than 7% to green house gases and only about 4% to carbon dioxide emissions (Davidson, *et al.*, 2003), the onus for such pollution being on the shoulders of the industrialized West and Southeast Asia. On the contrary, it is believed that Central Africa's dense humid forests covering approximately 2 million km² provide a major carbon sink to absorb CO₂ produced by the industrialized world. While it is estimated that a hectare of tropical forest is worth US\$ 50/year through wood exploitation that may not be sustainable, it is valued at US\$ 600 to 4,400/ha/year in carbon storage. The density of carbon accumulated above the ground in old tropical forests is on the order of 120 tons/ha, reaching only half that in temporal and boreal forests (Vande weghe, 2004).

5.9.4.9 Total annual forest loss, Sub-Saharan Africa in recent times

In recent times, although estimates on annual forest cover loss in Africa vary, all agree that the loss is in the millions of ha/year. Nan-Sinkam (1995) estimates that Africa loses an estimated 5 million ha/year of tropical forest. Reich, *et. al.* (2001) estimate forest consumption in Africa to be at about 3 million ha/year. Gruhn, *et al.* (2000) estimate that in Sub-Saharan Africa, between 1973 and 1988, forest and woodland area fell by 40 million ha or 2.7 million ha/year. FAOSTAT (2004) in Table 5.21 estimates that over a 33 year period, from 1961-94, about 775,242 ha/year of forest lost, increasing to 1.2 million ha/year of forest loss in Sub-Saharan Africa over the 13 year period from 1981-1994. The FAO (1993 *In:* Barbier, 1998) estimates a loss of 4.1 million ha/year between 1980 and 1990, mainly the result of land conversion associated with agricultural expansion (Table 5.22), 99% from Sub-Saharan Africa. Most agricultural expansion is believed to be happening in the savannas of Sub-Saharan Africa. Similar estimates are provided by GESAMP and ACOPS (2001). The loss of forest cover increased to

5.3 million ha/year by 2002, one must assume 99% from Sub-Saharan Africa, since the rest of the continent and insular Africa has little forest cover by comparison (FAO, 2002a). Any discrepancies come back to defining a forest since FAO (Table 5.21) admits that there is much overlap between what one calls forest and woodland versus permanent meadow and pasture. Because of this overlap and confusion, FAOSTAT stopped publishing forest and woodland cover data after 1995 referring interested parties to the FAO Forest Resources Division (FAOSTAT, 2004).

If one looks at a breakdown of deforestation in Table 5.22, where there is an estimated 4 million ha/year ($40,000 \text{ km}^2$) of forest lost on the mainland of Sub-Saharan Africa from 1981-1990, it can be deducted that about 1.1 million ha ($11,000 \text{ km}^2$)/year of forest is being lost in Central Africa, the majority in the Congo Basin (Gabon, DRC, Congo Brazzaville, Cameroon and the Central African Republic), and about 2.8 million ha ($28,000 \text{ km}^2$)/year in the remainder of the mainland of Sub-Saharan Africa, the majority of which would be forested savanna. If one takes Vande wege's (2004) current estimate today of 7,000 km^2/year low dense humid forest loss in the Congo Basin as being accurate, then another 4,000 km^2/year from deforestation of savannas is occurring in northern DRC, northern and extreme northern Cameroon, and much of the Central African Republic – that form a portion of the Congo Basin drainage. This can be added to the estimate of deforestation in Sub-Saharan Africa's savannas. Thus one obtains about 7,000 km^2/year (18% of total annual forest losses) in the dense humid forests, mainly in the Congo Basin, and 32,000 km^2/year ($28,000 + 4,000$) of deforestation in the savannas (82% of total annual forest losses), or about 4.4 times as much deforestation in the savannas as in the dense humid forests. This increased to 5.3 million ha/year ($53,000 \text{ km}^2/\text{year}$) by 2002 (FAO, 2002a), which using the above noted percentages would respectively amount to 9,540 km^2/year cleared of dense humid forests and 43,460 km^2/year of savanna woodlands. As

noted, today, west of Cameroon, low dense humid forests appear limited by comparison, while in East Africa, afromontane forests are limited to near the mountain peaks mainly in the form of parks bordered by small-scale farmers. Though significant with regards to biodiversity, factoring in the annual loss of these latter forests would modify the above estimate, but only in a minor way.

There are those who would disagree with these figures stating that secondary forests associated with fallow agricultural lands help maintain forest cover (Fairhead & Leach, 1996 *In: McCann, 1999*). The facts as we have seen them are that secondarily forested fallow lands are disappearing as per capita land for agriculture declines and fallow periods disappear. Thus, the opportunity for a continual production of secondary forest from fallow lands is rapidly disappearing over most of Sub-Saharan Africa.

5.10 CIVIL WARS - A MAJOR CAUSE OF DECLINING AGRICULTURAL PRODUCTION AND FAMINE IN SUB-SAHARAN AFRICA

Sub-Saharan African famines have evolved from being triggered mainly by drought to primarily being caused by civil war, often “resource wars”, (FAO, 2003c; FAO, 2005) (Table 5.24). From 1997-99, 30 developing countries had average per capita food consumption of below 2,200 kcal per day (FAO, 2002a).

“War and civil strife were significant factors in no less than half of these countries. In most of them, food consumption today stands at levels below those attained in the past. Some 23 of the 30 are in Sub-Saharan Africa, while only 7 are in other regions” (FAO, 2002a). “Repeated food emergencies are concentrated in Sub-Saharan Africa, where the majority of the affected countries (61%) are hosts to civil wars” (FAO, 2005).

Although famine early warning systems are important (Eicher, 1990 *In: Eicher & Staatz, 1990*), it would seem that in most cases, one can look at a map of civil wars and near civil wars (e.g., Zimbabwe) and determine where the major food emphasis is needed in Africa.

Table 5.24: Sub-Saharan African countries facing food emergencies at the beginning of the 21st century

SUB-SAHARAN AFRICAN COUNTRIES FACING FOOD EMERGENCIES: (Total: 23 countries)

COUNTRY	REASONS FOR EMERGENCY
Angola	Returnees, IDPs
Burundi	Civil strife, IDPs
Cape Verde	Drought
Central African Republic	Civil strife, IDPs
Congo, Democratic Republic of	Civil strife, IDPs, refugees
Congo, Republic of (Brazzaville)	Civil strife, IDPs
Côte d'Ivoire (Ivory Coast)	Civil strife, IDPs
Eritrea	Drought, IDPs, returnees
Ethiopia	Drought, IDPs
Guinea-Conakry	IDPs and refugees
Kenya	Drought in parts
Lesotho	Adverse weather in parts
Liberia	Civil strife, IDPs
Madagascar	Drought in parts, economic disruption
Mauritania	Drought
Mozambique	Drought in southern parts
Sierra Leone	Civil strife, IDPs
Somalia	Civil strife, drought in parts
Sudan	Civil strife, drought in parts
Swaziland	Drought in parts
Tanzania	Drought in parts, refugees
Uganda	Civil strife, IDPs, drought in parts
Zimbabwe	Drought, economic disruption

Note: Internally Displaced Persons (IDPs), while refugees are from neighboring countries and "returnees" are returned refugees or IDPs.

Source: FAO (2003c), with permission, UN& FAO.

Poverty, environmental degradation and economic stagnation are often the symptoms that seem to breed civil war, while in turn civil wars cause poverty and economic decline. The poorest 16% (1/6th) of humanity endures 80% (4/5^{ths}) of

the world's civil wars. In 1999 in Sub-Saharan Africa, one in five (20%) people lived in a country racked by civil or cross-border wars. About 90% of the casualties were civilians, 19 million people were displaced, and 20 million landmines were waiting to take out an unsuspecting person or animal (Guest, 2004).

Based on statistics from the UN and the U.S. Committee for Refugees, in November 2000, world-wide 23.5 million people were in need of humanitarian assistance due to conflict of which 18.5 million (79%) were in Angola, Burundi, Congo (Brazzaville), DRC, Guinea-Conakry, and Côte d'Ivoire (refugees and Internally Displaced Persons/IDPs), Eritrea, Ethiopia, Kenya (refugees), Liberia, Rwanda, Sierra Leone, Somalia, Sudan, Tanzania (refugees), Uganda and Zambia (refugees). Women and children make up 70–80% of the refugees and Internally Displaced Persons (IDPs) uprooted by violence (Messer & Cohen, 2001). "There are 13 million Internally Displaced Persons (IDPs) and 3.5 million refugees, more than twice the absolute number in Asia, which has 5 times the population of Africa" (Commission for Africa, 2005).

Of 15 UN peacekeeping missions around the world, five are based in Africa: United Nations Mission in Liberia (UNMIL), United Nations Mission to the Democratic Republic of Congo/*Mission de l'Organisation des Nations Unies en République Démocratique du Congo* (MONUC) - the Great Lakes), United Nations Mission in Ethiopia and Eritrea (UNMEE), United Nations Mission In Sierra Leone (UNAMSIL) and United Nations Mission for the Organization of a Referendum to the Western Sahara/*Mission des Nations Unies Pour l'Organisation d'un référendum au Sahara Occidental* (MINURSO). Out of 48,590 soldiers and police officers under UN command, nearly 75% are on the African continent, including 10,866 with MONUC, the peacekeeping mission based in the Democratic Republic of Congo (DRC). UNMIL in Liberia is set to

become the UN's largest mission in 2004, with some 15,000 peacekeepers (ICG, 2004a). In June 2004, as unrest breaks out along the DRC/Rwanda border, the DRC requested additional UN peacekeepers.

Every major famine in Sub-Saharan Africa since 1960 has been directly or indirectly influenced by civil war and political conflict with the exception of the 1968-74 famine in the Sahel, when an estimated 100,000 people died. Since the prognosis for ending civil wars in Africa in the near future is limited, Africa will have a difficult time ending famine, as is the case in Asia (Eicher, 1990 *In: Eicher & Staatz, 1990*).

Famine may not only be a by-product of war, it may also be an instrument of war (e.g., Angola, Sudan, Horn of Africa) (Roman, 2003). African countries in conflict produce 12.4% less food per capita in war years compared to production during peacetime, and for the region as a whole, Africa's food production would have been 2 to 5% higher if there were no conflicts (Mule, 2003). According to the Food and Agriculture Organization of the United Nations, in 1990–97, conflict-induced losses of agricultural output in Africa totaled US \$22 billion, a sum equivalent to 33% of the aid received by the conflict countries and far in excess of Foreign Direct Investment (FDI) flows (Messer & Cohen, 2001).

Africans solutions to democracy have yet to found. It would be naïve to think that many of the current African governments represent the majority of citizens in their countries, the elite being in cahoots with the former colonial powers, their multi-nationals and/or donors. Meanwhile, political elites, drawing upon the desperately poor and uneducated masses, use them as pawns as they vie for access to the wealth generated from the “*mining*” of the continent’s natural resources (e.g. minerals, timber, petroleum, soil, wildlife). This has resulted in civil war and conflicts and corresponding food shortages since the end of colonialism. The

drama of it all is that one of the resource richest continents in the world is among the poorest and most backwards. Why? The reasons behind much of this violence are discussed in a Chapter 13 that looks into the background of resource wars in Sub-Saharan Africa (see Section 13.5, FAILURE TO DEVELOP GOOD GOVERNANCE IN MINERAL RICH COUNTRIES and Section 13.10, RESOURCE WARS).

5.11 CONFLICT LINKED TO OVER-POPULATION AND DESERTIFICATION – SCARCE RESOURCES

“ ‘ To continue treating conflicts in Africa as purely ethnic, tribal or religious, ignoring, in the process, the growing impact of restricting or denying access to resources and the growing ecological degradation and depletion of the renewable resource base, could ultimately, lead to a distorted understanding of the real situation and consequently, limit the possibility of a genuine conflict resolution’ ” (Suliman, 1999 *In: Koch, 2004 In: Fabricius, et al., 2004*).

Bachelor (1999 *In: Koch, 2004 In: Fabricius, et al., 2004*) describes how a degraded environment can lead to political and armed conflict.

“Tension over access to land, grazing rights, water, forests, fishing stocks, and other vital resources has also played a central role in violent conflict in Africa. Conflict between herders and cultivators over access to land creates localized violence in many parts of Africa, but can also often stretch across borders and lead to larger conflicts. For example, such disputes contributed to the current violence in Darfur, Sudan. In Côte d'Ivoire, growing local tensions over land use, linked to migration and national identity, contributed to national instability. Shared water resources can lead to tensions between countries, as in the Nile Basin” (Commission for Africa, 2005)

5.11.1 Conflict Linked to Over-Population and Desertification in Sub-Saharan Africa

“Desertification occurs whenever a non-desert area starts to exhibit the characteristics of a true desert. The term was coined by the United Nations in 1977. Over the past 50 years, at the southern edge of the Sahara, an area the size of Somalia has become desert. The same fate now threatens more than 33% of the African continent. The main cause of desertification is not drought, but mismanagement of land, including over-grazing and felling of trees and brushwood for fuel” (University of Michigan, 2002). The USDA defines desertification as “land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities” (Reich, *et al.*, 2001).

Reich, *et al.* (2001), using information from the soil and climate resources of Africa, made an assessment of land resource stresses on the continent. Twenty-five (25) stress classes⁸⁸ were defined and prioritized according to the severity of the constraint in terms of the effort required to correct it for agricultural use. The results of the spatial analysis using a Geographic Information System (GIS) to create a “GIS Desertification Vulnerability” map was coupled to an interpolated population density map to obtain estimates of the number of persons affected by desertification.

Desertification processes affect about 46% (Reich, *et al.*, 2001) (compared to 33% above - University of Michigan, 2002) of the 29.8 million (Reich, *et al.*, 2001) to 30.3 million km² of Africa (Clark, *et al.*, 1975). The significance of this large area

⁸⁸ Low organic matter, high soil temperature, seasonal excess water, minor root restrictions, short duration low temperatures, low structural stability, high anion exchange capacity, impeded drainage, seasonal moisture stress, high aluminum concentrations, calcareous/gypseous, nutrient leaching, low nutrient holding capacity, High P and N retention, acid sulphate, low moisture and nutrient status, low water holding capacity, high organic matter, salinity/alkalinity, shallow soils, steep lands, extended low temperatures, extended moisture stress, etc.

becomes evident when one considers that excluded from this analysis were areas that have a hyper-arid or a humid climate (Reich, *et al.*, 2001) (Figure 5.11):

- **Desert and Steep Areas, Only Suitable For Grazing.** About 42.7 - 55% ($12.7 - 16.4^{89}$ million km²) of the land, already desert, is unsuitable for any kind of sustainable agriculture apart from nomadic grazing. Though agriculture is considered unsustainable due to soil salinization, moisture restrictions, etc., 30% of Africa's population or about 200-250 million people are living on or are dependent on this land, a large portion of these people living on the desert margins of the Sahara and Kalahari regions and along rivers traversing these areas such as the Nile and the Okavango Delta.
- **Humid Areas.** Only about 11% (3.3 million km²) of the land mass is humid and by definition is excluded from desertification processes. This is not to say that the habitat could not be degraded by man's interventions.

Of the remaining land, 34-46.3% of the continent mostly in Sub-Saharan Africa, the following area was calculated as being prone to desertification; the very high area is along desert margins (Table 5.25) (Reich, *et al.*, 2001). Thus, the majority of the land and the people affected by desertification on the continent are those living in Sub-Saharan Africa (Figure 5.11).

As calculated by Reich, *et al.* (2001), if one subtracts off the two areas not considered (desert/steep slopes of 12.7-16.4 million km² and humid areas of 3.3 million km²), one would have to conclude that 68-93% of the remaining land is

⁸⁹ Reich, *et al.* (2001) use two different percentages in their report, though the lower percentage found in their Table 4 appears to possibly not include steep-sloped areas., which could account for the difference of 42.7 % in Table 4 and 55 % given in the text.

prone (moderate to very high) to desertification, using 29.8 million km² as the base for the area of the continent.⁹⁰ Most of this land is in Sub-Saharan Africa.

Table 5.25: Estimates of African land area belonging to vulnerability classes and corresponding number of impacted population

Vulnerability class	Area subject to desertification km²	%	Population affected	
			Millions	% of African pop.
Low	4,225,000	14.2	154.5	19.9
Moderate	4,741,000	15.9	196.1	25.3
High	3,213,000	10.8	134.8	17.4
Very high	1,466,000	4.9	22.4	2.9
TOTAL	13,645,000	45.8	508.2	65.5

Extracted From: Reich, *et al.* (2001) with permission, USDA & public domain.

It has been demonstrated around the world that low-input agriculture, particularly in the absence of appropriate conservation practices (e.g., fallowing), leads to degradation of the land. As African farming is essentially a low-input low-output system, land degradation is rampant and recent studies show a progressive decrease in the performance of the land. The situation is further constrained by the geometric increase in domestic animal populations (Reich, *et al.*, 2001), particularly goats (see Chapter 6, Table 6.2: Livestock numbers in Sub-Saharan Africa, 1961-2003).

Practically every country in Africa is prone to desertification, but the Sahelian countries at the southern fringe of the Sahara are particularly vulnerable. Only about 19% of Niger is non-desert and of this 17% belongs to high and very high

⁹⁰ (29.8 million km² - [12.7+3.3] million km² desert/humid) = 13.8 million km² prone to desertification; or [9.4 million km² (Moderate to Very High)/13.8 million km²] x 100= 68%, or (29.8-[16.4+3.3] = 10.1 million km² prone to desertification, 9.4/10.1 x 100 = 93%

vulnerability classes. The Mediterranean countries of North Africa have similar large areas subject to this land degradation process as do countries on the fringe of the Kalahari Desert (Reich, *et al.*, 2001). The lands with very high risk are mostly at the desert margins in the Sahel and along the eastern seaboard of Africa. There is also a large contiguous area in the DRC where the Kalahari sands have penetrated (Reich, *et al.*, 2001).

Eswaran, Reich and Beinroth (2003) undertook a study “to define and locate desertification tension zones around the world where the potential decline in land quality is so severe as to trigger a whole range of negative socioeconomic conditions that could threaten political stability, sustainability, and the general quality of life”. Tension zones result from:

- “Excessive and continuous soil erosion resulting from over and improper use of lands especially marginal and sloping lands;
- Nutrient depletion and/or soil acidification due to inadequate replenishment of nutrients or soil pollution from excessive use of organic and inorganic agro-chemicals;
- Reduced water holding capacity of soils due to reduced volume of soil and reduced organic matter content, both a consequence of erosion and reduced infiltration due to crusting and compaction;
- Salinization and water-logging from over-irrigation without adequate drainage; and
- Unavailability of water stemming from decreased supply of aquifers and drainage bodies” (Eswaran, *et al.*, 2003).

To evaluate the number of people affected, the map of vulnerability to desertification was superimposed on an interpolated population density map

developed by Tobler, Deichmann, Gottsegen and Maloy (1995 *In: Eswaran, et al.*, 2003). In a second analysis, classes of population density were superimposed on the desertification map. In a third step of the analysis, they looked at the relation of serious conflicts in countries to risk of desertification. A conflict as defined by the International Peace Research Institute (IPRI) is one where at least 1,000 deaths resulted from a war. IPRI (1999 *In: Eswaran, et al.*, 2003) has documented countries with conflicts from 1989 to 1998. The concept of desertification suggests some or all of the following negative effects and the probability of their occurrence is highest in the tension zones:

- Systematic reduction in crop performance even leading to failure in rainfed and irrigated systems;
- Reduction in land cover and biomass production in rangeland with an accompanying reduction in quality of feed for livestock;
- Reduction of available woody plants for fuel and increased distances to harvest them;
- Significant reduction in water from overland flows or aquifers and a concomitant reduction in water quality;
- Encroachment of sand and crop damage by sand-blasting and wind erosion; and
- Increased gully and sheet erosion by torrential rain;

As a consequence of some or all of these processes, there commonly occurs societal disruption due to reduction in life-support systems. A “burning belt” exists at the transition zone where nomadic desert life meets sedentary Sahelian life, a line of conflicts and wars from Mauritania to Sudan (Kloff & Pieterse, 2002) resulting from land scarcity and degradation, which is obvious from observing Figure 5.11.

It can be argued that part of the problem today in the DRC, site of Africa's first World War, has to do not only with a scramble for the DRC's wealth of resources, but also with over-populated, soil degraded, low land per capita Rwanda and Burundi needing to expand their territories in order to relieve population pressures (see Section 5.9.4.6, Deforestation in afromontane forests, Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization). Part of the problem in 2003/2004 in the Ivory Coast can be linked to over-population and associated desertification in countries like Burkina Faso resulting in a mass exodus south placing tremendous pressures on scarce land resources and heightening ethnic and religious tensions. This will become an increasing problem in coastal countries such as Ghana, as people flee Sahelian states incapable of feeding themselves or offering a viable lifestyle for their citizens. One would predict that Kenya and possibly Tanzania will face increasing internal conflicts over scarce land between pastoralists and small-scale farmers to an extent that could disrupt civil society.⁹¹ This is exacerbated especially in Tanzania from external pressure to maintain 40% of its territory in parks and protected areas, resulting in habitat degradation where humans and their livestock have been compressed (see Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers).

Finally, the untold ecological damage (deforestation, soil mining, poaching, and pollution) as the result of concentrating people in refugee camps flocking out of these civil wars has yet to be quantified on a continental basis, such as the 600,000 refugees in northwest Tanzania in 1994 as a result of the Rwanda crisis.

⁹¹ (see Chapter 3, Section 3.6, THE END OF COLONIALISM AND THE ACCELERATION IN PHYSICAL SEPARATION OF AFRICANS FROM THEIR RESOURCES, Section 3.6.1, Separation of Maasai From Ngorongoro Crater, Section 3.8.4, Land Compression and the Maasai of Kenya and Tanzania, Section 3.8.5, Land Compression, Wakamba and the Black Rhino of Machakos Kenya, Section 3.11.1, Population, Kikuyu and the Mau Mau and Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya.

This is believed to have resulted in massive deforestation for firewood and poaching for food.

5.11.2 Over-population, Desertification and Instability, Nigeria

Although the differences between the Moslem north and Christian south were reinforced by Britain's "divide and rule" policy (see Chapter 3, Section 3.1, COLONIAL STATE IN AFRICA) today population pressures over scarce resources exasperate these problems.

"Many other countries in Africa face a similar situation, including Nigeria, the continent's largest most populous country with 121 million people. President Olusegun Obasanjo is trying desperately in his strife-torn country to maintain peace between the Christian south and the Muslim north and among various tribes. However, as the desert claims 350,000 ha (3,500 km², 877,000 acres) of rangeland and cropland each year, people are forced southward into already densely populated areas. The same population pressures, land degradation, and hunger that ignited social tensions in Rwanda are building in Nigeria" (Brown, 2003a).

Affecting each of the 10 northern states, desertification has emerged as Nigeria's leading environmental problem. "Since its population is expected to increase from 121 million today to 258 million in 2050. With a population in 2050 approaching that in the United States today, squeezed into a country only slightly larger than Texas, the handwriting on the wall is clear" (Brown, 2003a). In 2004, over much of northern Nigeria, friction between Muslim Fulani herders and Christian farmers was/is a major issue (see Chapter 6, Section 6.1.4.7, Impacts on pastoralism and range ecology from increases of human and livestock populations in the 20th century). As a result of "localized" conflict in Nigeria, at least 10,000 people lost their lives between 1999 and 2003 and an estimated 800,000 were internally displaced in ongoing localized violence and short-lived but vicious

communal fighting (Commission for Africa, 2005). It is likely these conflicts over scarce resources will only worsen as populations increase.

5.11.3 Land and Civil War, the Ivory Coast

See Section 5.7.4.4, Land reform and civil war in the Ivory Coast.

5.11.4 Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics

“The conflict began as an ecological crisis, arising at least in part from climate change. Two decades ago, rain in southern Sudan began to fail...average precipitation declined by 40% since the early 1980s...coincided with a rise in temperatures of the Indian Ocean, disrupting seasonal monsoons...It is no accident that the violence in Darfur erupted during the drought. Until then, Arab nomadic herders had lived amicably with settled farmers...But once the rains stopped, farmers fenced their land for fear it would be ruined by the passing herds. For the first time in memory, there was no longer enough food and water for all. Fighting broke out...Any peace in Darfur must be built on solutions that go to the root causes of the conflict...involves sustained economic development...such as genetically modified grains...irrigation and water storage techniques...new roads and communications infrastructure...health, education, sanitation...violence in Somalia grows from a similarly volatile mix of food and water insecurity. So do the troubles in Ivory Coast and Burkina Faso” Ban Ki Moon (2007), secretary general of the United Nations.

The crisis in Darfur is not new, maybe already 20 years old, the only difference being that CNN and BBC are broadcasting for the world to see, while 38,000/month die in the eastern DRC (Schlein, 2006) and the world seems oblivious since this receives little publicity on international television networks. Also with increasing populations the crisis is worsening. Rosenblum and

Williamson (1987) discuss famine in Darfur back in the 1980s and the logistics of getting 360,000 tons of sorghum to the starving people in this Western province.

The Darfur region in the north-western corner of Sudan, covers approximately 500,000 km², amounting to 20% of Sudan's territory. Darfur could be divided into six ecological zones as follows (Abdul-Jalil, 2005 *In: ACTS*, 2005):

1. The **desert zone** in the north covers 28% of Darfur and consists mainly of sandy stretches and dunes, little and very low precipitation (0-100mm), nomadic pastoralists raising cattle and sheep spending part of the year in this region.
2. The **semi-desert zone** lies south of the desert with sandy stretches covered by low grass and bushes of small trees, averaging 100-225 mm of rain/year, the main activities being livestock and some cultivation of millet in good years along *wadis* (water courses). In some places wells are dug and irrigated horticulture is practiced.
3. The **Jebel Marra Plateau** in centre of Darfur reaching 3,048 m (10,000 feet) above sea level is the major watershed of Darfur with good soil and stable rainfall of up to 1,000 mm/year, allows for intensive agricultural durra, millet, vegetables, citrus fruits (mainly oranges and grapefruits) and potatoes serving urban centers as far away as Khartoum.
4. The **Central Goz** extending east of Jebel Marra into the region of Kordofan consists of sandy plains (steppes) covered with bushes and short grass, 225-400 mm/year, suitable for sheep raising, marginal for millet cultivation, and since the 1970s for commercial oil seed cultivation (peanuts, sesame and water melon) as cash crops.
5. The **Alluvial Plains West Of Jebel Marra** with fertile clay soil, rainfall of 400-600 mm/year with large tree lined wadis originating from Jebel Marra (Baare, Azoom, Kaja, and Aribu) pass through different parts of

this zone that permits perennial horticulture in addition to rainfed cultivation, as well as serving camel nomads from the north during the dry season

6. The **Southern Plains** consist of stretches of sand intermingling with clay soil, otherwise termed “Baggara repeating pattern” by ecologists, with rainfall 600-750 mm/year, soils suitable for large-scale agricultural activities, but a lack of roads and other infrastructural inputs allows for only limited mechanized commercial agriculture. Expansion of oil seeds cultivation for the last two decades, and its “Baggara Belt” in recognition of its rich savannah pastures preferred by Arab cattle nomads roaming central Sudan.

Arab and African communities in Darfur have for decades intermittently clashed over land and scarce resources. As across the Sahel, the root of much of the conflict is competition over fertile land and water (DeCapua, 2004a; Human Rights Watch, 2004; ICG, 2004b), especially during the dry season of November to April, exacerbated by desertification in northern Sudan and the drought that has affected Darfur on and off since the 1970s. Nomadic groups of all origins from the northern semi-desert belt have been pushed southward in search of grazing lands and water. The regular presence of nomads and their herds in Darfur's agriculturally rich central belt has caused friction with farmers. Ecological decline and a lack of development in the entire region have combined to impoverish Darfur people of all ethnic backgrounds (Human Rights Watch, 2004; ICG, 2004b).

There are at minimum 36 main tribes, but some sources cite as many as 90 by including subdivisions or clans. This mix is composed of two major blocks, nomadic Arab camel herders and non-Arab (blacks believed to have originated

from Chad), the latter known locally as *Zurga*, or “blacks” (Human Rights Watch, 2004; ICG, 2004b).

“Centuries of coexistence and intermarriage have reduced distinctions to the cultural identification or non-identification with the Arab world as members of both groups are dark-skinned. Except for the Zaghawa, who specialize in herding camels, the indigenous black African groups depend on subsistence farming and animal husbandry, while groups of Arab extraction live on camel herding in northern Darfur and cattle herding in southern Darfur” (ICG, 2004b).

All groups are Muslim. One observes distinctions more along divisions of clan, labor and cultural identify rather than pure racial or religious lines compared to the problems between Khartoum and southern Sudan (see Chapter 13, Section 13.10.1.6, Oil-scorched earth Sudan). Thus, the “word ‘Arab’ represents a cultural rather than a racial identity” meaning Arabic-speaking people, who have mixed with the indigenous non-Arab Sudanese and who physically bear more similarities with Africans than with the people of the Arabian Peninsula (Abdul-Jalil, 2005 *In: ACTS*, 2005).

The indigenous Darfurian tribes consist mainly of settled farmers and small-scale traditional cultivators, of whom the Fur is the largest tribe and founder of the Fur Sultanate, the traditional rulers of the region. Other non-Arab tribes include Zaghawa nomads, Tunjur, Meidob, Masalit, Berti, Tama, Mararit, Mima, Daju, and Birgid and Fallata (cattle herders). Arab tribes include the Rezeigat, Habbaniya, Bani-Halba, Taisha, Maaliya, Salamaat plus some smaller groups, all cattle nomads living in southern Darfur. In northern Darfur live the Bani Husain cattle nomads plus Zaiyadiya and northern Rezeigat (a collective name for Mahameed, Mahriya, Eraigat, Etaifat, and Awlad-Rashid) who are camel nomads. Other than the development of the rich central region, Darfur suffers from being an undeveloped region in an undeveloped country. The main contribution of

Darfur to the national economy is its livestock sector, accounting for 30% of the national livestock trade and 25% of the national livestock population. This sector is dominated by an elite merchant class, mainly from central riverian areas (commonly known as *Jellaba*), middlemen for the internal market and the international livestock trade that from 1978-1984 accounted for 20% of Sudan's GDP (Abdul-Jalil, 2005 *In: ACTS*, 2005).

Historically, the indigenous groups and earlier settled Arab migrants each had their own *dar* (tribal homeland or traditional management area) (ICG, 2004b; Abdul-Jalil, 2005 *In: ACTS*, 2005). Tribal homelands were named after the tribe (e.g., *Dar Zaghawa* or land of the Zaghawa people and *Dar Rezeigat* or land of the Rezeigat people) (Abdul-Jalil, 2005 *In: ACTS*, 2005). The major tribes voluntarily agreed to settlement of other groups and accorded them a recognized administrative status (ICG, 2004b; Abdul-Jalil, 2005 *In: ACTS*, 2005).

Until the outbreak of the current inter-ethnic civil war, many nomads kept animals for their sedentary friends, while farmers would reciprocate through gifts and giving access to the remains of agricultural produce for fodder during the dry season. While cattle-herding Arab groups occupying most of southern Darfur estate (Rezeigat, Habbania, Taisha, Beni Halba) traditionally had their own *dars*, the Arab camel nomads of northern Darfur did/do not have *dars* of their own. Communal land can be further subdivided (Abdul-Jalil, 2005 *In: ACTS*, 2005):

- “At the communal scale, each tribe has a given land as a *dar*.
- Within the tribal *dar*, there is the clan ownership with a known boundary
- At the village level, there is the village land where each villager practices his private ownership respected by all.
- Unclaimed land, used as rangeland or allotted to “strangers” (migrants) by the village head’.

Disputes between nomads and farmers were resolved through negotiation between traditional leaders on both sides, compensation for lost crops, and agreements on the timing and routes for the annual migration (Human Rights Watch, 2004).

The full scale civil war dating back to 1985 at the height of the drought,

“the nomadic ‘scramble’ from the impoverished *Dars* into the rich agricultural central heartland is the cause of the continuing conflict; it is the contest of the drought-stricken for the green oasis. The conflict is being fought primarily over the control of a thriving resource base in the middle of a zone of scarcity. It is a classical ecological conflict” (Abdul-Jalil, 2005 *In: ACTS*, 2005).

In addition, Darfur’s population has multiplied nearly 5 times since 1973 from 1,350,000 to 6,480,000. This has resulted in decreased fallow and decreased productivity, loss of dry season migratory routes (*marahil*) for nomadic pastoralists, increased livestock populations linked to entering a market economy, which along with increasing commercial agriculture all contributed to land degradation and desertification (e.g., from tree-felling, excessive cultivation and over-grazing). Over-grazing in the semi-desert and *goz* zones resulted in carrying capacity going from 40-50 animal units/km² in the 1970s to 9 animal units/km² in 2002 (Abdul-Jalil, 2005 *In: ACTS*, 2005).

However, “the fact that the central government is heavily involved as a stakeholder in the war makes it difficult to conclude that the current civil war in Darfur is only driven by competition over resources” (Abdul-Jalil, 2005 *In: ACTS*, 2005).

The Khartoum government tampering with these traditional systems has had the cumulative effect of seriously disrupting co-existence, especially by promoting ethnicity and political divisions (ICG, 2004b). In 1986, a number of Arab tribes formed what became known as the “Arab alliance” (*Tujammo al Arabi*) aimed at establishing their political dominance and control of the region (Human Rights

Watch, 2004). Government intervention involved “redrawing traditional political boundaries” and handing these politicized as opposed to management units over to “Arab” dominated groups to administer. For instance, the traditional homeland of the Massaleit (Masaalit) ethnic group was divided into 13 Amarat (principalities), of which five were allocated to Arab groups. This is believed to have been part of a broader scheme that resulted in redrawing the nine states into 26 and 18 provinces into 72, centralizing bureaucratic control by Khartoum as opposed to decentralizing and empowering the grass roots as had been promised. Some argue that this was undertaken to tighten the nationwide grip of the National Islamic Front (NIF) by placing its members and co-opted clients in position of influence (ICG, 2004b). This might be considered a form of gerrymandering. This is further complicated by a split in the Islamic movement that had taken over Sudan in 1989.

“Following a disagreement with Hassan el-Turabi, the architect and spiritual guide of the Islamist movement, the top NIF cadre in Darfur, Yahiya Ibrahim Bolad, defected to the SPLA and led its 1991-1992 offensive into the region. In response the government armed and mobilized Arab tribal warriors and portrayed the insurgency as an uprising by the Fur people. The success of the strategy cemented Khartoum's alliance with Darfur Arab fighters....Turabi, then speaker of parliament, formed the Popular National Congress (later renamed the Popular Congress, PC) following a fierce power struggle with the ruling National Congress Party. To broaden its base, PC activists reached out to Sudan's majority but marginalized African (black) population. The PC even signed an agreement with the Sudan People's Liberation Army (SPLA) in February 2001 in which the two parties undertook to pursue the ouster of the (Omar) al-Bashir government by peaceful means. The government reacted by banning PC activities and detaining many of its leaders, including the elderly Turabi, until late 2003” (ICG, 2004b).

el-Turabi was/is an ally of Osama bin Laden, having given him and his family refuge from Saudi Arabia after the 1991 Gulf War, when Saudi Arabia decided to

allow American and European soldiers to be permanently based on Saudi soils and the House of Sa'ud in essence forced bin Laden into exile (Bodansky, 2001). Government intervention, from disregard for traditional management systems and politicization of ethnic divisions, resulted in fighting for the first time from 1987-1989 between “27 allied nomadic Arabs tribes” and the sedentary Fur ethnic group over-grazing and water rights. The Fur are said to have lost 2,500 people and 40,000 cattle and had 400 villages burned, causing tens of thousands to go to Internally Displaced Persons (IDPs) camps. A thriving fruit and vegetable farming sector was crippled as nomadic raiders destroyed fruit trees and burned irrigation pumps and tractors. The Arab groups lost 500 people and had hundreds of camps burned (ICG, 2004b).

Fourteen months ago two new rebel groups emerged, the Sudan Liberation Movement/Army (SLM/A) and the Justice and Equality Movement (JEM) that demanded the Sudanese government stop arming the Arab “Janjaweed” militias in Darfur and address under-development in the region (Human Rights Watch, 2004). In early 2003, these rebel groups attacked a military installation (ICG, 2004b). Human Rights Watch (2004) estimates this militia to be at 20,000.

The Janjaweed is built on a tradition of the *Hambati* or “social bandits”, or robbers rejected by their communities for flouting established traditions but envied for their exploits. Other elements are thought to be professional criminals, some allegedly released by government to join or lead the militia.

“Building on existing ethnic tensions and a raider culture, the government armed the Janjaweed to supplement the army and gave carte blanche for looting and rape” (ICG, 2004b).

The most frequently mentioned groups of Janjaweed are the Irayqat and Ouled Zed subclans of the camel herding northern Rizeigat, the Mahariya, and the Beni

Hussein. New recruits to the Janjaweed militia received an initial fee that could range from US\$ 100 to US\$ 400 with relatives guaranteed support should a militia member be killed in battle. Many Janjaweed receive monthly stipends exceeding the salary of army soldiers (about 100,000 Sudanese pounds or \$100) as well as regular supplies of sugar and oil. They also receive arms, uniforms, communications equipment and identity cards from the Sudanese government (Human Rights Watch, 2004).

All of this was compounded by leaders of the various factions seeing this as a chance to advance themselves politically, socially and economically. They used as models, former Chadian President Hissène Habré and the man who replaced him, President Idriss Déby, a Zaghawa who trained ethnic militias in the Darfur area, launching campaigns to seize power in 1982 and 1990 respectively (Human Rights Watch, 2004; ICG, 2004b).

“Déby came to power in 1990 through a support from Zaghawa Khartoum-based insurgency that supported him in the overthrow of ex-President Hissène Habré...The Sudan Liberation Movement/Army (SLM/A) and Justice and Equality Movement (JEM) rebel groups were initially dominated by Zaghawa, and the support of the Chadian Zaghawa community and, unofficially, many Zaghawa whom Déby brought into the Chadian military, has been important for both groups. The SPLA is also alleged to have played a role in supporting the SLA in its initial stages, although its support is believed to have been minimal since the peace talks began” (Human Rights Watch, 2004).

However, in April 2004, Sudan People’s Liberation Army (SPLA)’s John Garang, left the peace talks for a few days to meet in Eritrea with SLM leader Abdulwahid Mohammed Ahmed and was accused by the Sudanese government of supporting the rebels in Darfur (Ryu, 2004). Garang died in a helicopter crash in 2005 (see Chapter 13, Section 13.10.1.6, Oil-scorched earth Sudan).

Like much of Africa and the cause of many of Africa's problems in the 20th and 21st centuries. These countries were divided along colonial lines with ethnic groups naturally traversing both borders. This offers refuge from one country to the next for dissidents who can hide among their ethnic group.

One of the major differences between the north/south fighting with the SPLA as opposed to Darfur in the west is that against the SPLA

"the Sudanese government recruited volunteers to fight in the south on the basis of '*jihad*,' or a religiously-sanctioned war against the largely non-Muslim southerners. In Darfur, in contrast, the communities under assault are Muslim, but that has not proved to protect them from the same abusive tactics...The rebels and their communities believe that the real motivation for this conflict is the 'Arabizing' (rather than Islamic or Muslim) thrust of this and previous Sudanese governments" (Human Rights Watch, 2004).

Taking advantage of the internationally regulated cease-fire in the south, the Sudanese government's response was to shift its Antov's and Mig aircraft as well as attack helicopters and other heavy weapons, purchased with oil revenue from the south, to the western region of Darfur. A massive bombing campaign in 2003 combined with the raids of the marauding militias, have forced more than 800,000 people from their homes and sent an additional 110,000 people into neighboring Chad (Human Rights Watch, 2004; ICG, 2004b; Sheridan, 2004). By July 2004, an estimated 30,000 people had been killed and 1 million had been displaced (DeCapua, 2004b; VOA, 2004a). By October 2004 these figures were raised to 70,000 killed and 1.5 million displaced (Gollust, 2004). Other estimates are of 10,000 people dieing/month (Heinlein, 2005a). By May 2005, an estimated 180,000 people had died since the outbreak of the war two years ago (Heinlein, 2005b).

In a scorched-earth campaign, government forces and Arab “Janjaweed” militias have killed several thousand civilians from the Fur, Zaghawa and Masaalit ethnic groups, routinely raped women and girls, abducted children, and looted tens of thousands of cattle and other property. In many areas of Darfur, they have deliberately burned hundreds of villages and destroyed water sources and other infrastructure, making it much harder for the former residents to return (Human Rights Watch, 2004; ICG, 2004b). Over the past months however, members of some smaller tribes such as the Jebel and Dorok peoples have also joined the rebellion following “Janjaweed” militia attacks on their communities (Human Rights Watch, 2004). ICG (2004b) believes that this is an indiscriminant attack on civilians and the widespread destruction of schools, clinics, wells and irrigation pumps is an effort to permanently displace these ethnic groups; a form of ethnic cleansing of the area. Human Rights Watch (2004) accuses the local rebel groups of similar atrocities against civilian groups.

ICG (2004b) accuses the Khartoum government of deliberately slowing down the Naivasha peace negotiations, knowing it would not be condemned by the international community, to give it time for the offensive in Darfur. In fact, in April 2004 George W. Bush recommended to Congress not to impose sanctions on either the Sudan government or the SPLA mandated by the U.S. Sudan Peace Act, accepting that although the peace process in Naivasha was moving slowly, it was moving. “The Bush administration has aggressively pursued a government-SPLA peace agreement, while its approach to the Darfur conflict has generally lacked the same urgency” (ICG, 2004b). There was also concern that by mixing the Darfur issue with the SPLA/Khartoum peace agreement process, that this process could be derailed. However, the 1997 U.S. economic embargo against Sudan was continued because its actions and policies were considered a threat to U.S. national security and foreign policy (ICG, 2004b). The priority of the

SPLA/Khartoum peace talks over Darfur, likely has much to do with access by Western interests to oil that occurs in the south.

The implications of this conflict go far beyond Darfur's borders, indirectly threatening the regimes in both Sudan and Chad with the potential to inspire insurgencies in other parts of the country. The Beja Congress, an ethnically based armed group from eastern Sudan, has already allied itself with the SLA, other groups could emerge -- east and west -- in an anti-government coalition. Even SPLA elements from the Kordofan region of the Nuba Mountains demanding a fair share in the oil wealth and Southern Blue Nile might be attracted back to the battlefield should they become dissatisfied with the Inter-Governmental Authority on Development (IGAD) talks (ICG, 2004b) in Naivasha, Kenya. Human Rights Watch (2004) reports of regular attacks of villages by Janjaweed across the border in Chad, risking to destabilize this area. This has also ignited tensions among Chadian ethnic groups that share blood ties with Darfurians, and as in Sudan, previously coexisted in Chad. Interestingly enough, Chadian military forces have conducted cross-border hot pursuit of the "Janjaweed" into Sudan with the Sudanese government's permission. "Darfur is a stark reminder that Sudan's crisis has more to do with the structural imbalances of governance and economic development that characterize the relations of the center with peripheral regions than with the north/south divide" (ICG, 2004b).

Further complicating the picture, fighting between the government and the SPLA resumed in several areas since the end of January 2004 despite the cessation of hostilities agreement. In the western Upper Nile oilfields, the trigger was defection to the SPLA of two commanders of the pro-government South Sudan Defense Forces (SSDF), Tito Biel and James Lieh Diu. Combat likewise flared up between government-aligned militias and the SPLA in the Shilluk Kingdom in the southeast where Dr Lam Akol's former government-aligned SPLM/United merged

with the SPLA in November, 2003 (ICG, 2004b). In April, a tentative peace accord was signed between the SPLA and Khartoum, (see Chapter 13, Section 13.10.1.6, Oil-scorched earth Sudan). Time will tell if this accord is lasting and if it will positively impact what is happening in troubled Darfur.

“Washington issued on 2 March 2004 its strongest public statement to date, expressing grave concern about the deepening crisis and condemning the Janjaweed and other government-supported militia, who ‘continue to attack and burn undefended villages, murdering and raping the inhabitants...’” (ICG, 2004b). By July 2004, the African Union agreed to send 300 peace keepers to the area (VOA, 2004b), while Sudan agreed under pressure from the United States and United Nation to lift restrictions on the movement of food aid and relief workers into Darfur (Nunan, 2004). While global bureaucrats argue over the nuances of whether what is happening is “genocide”, “ethnic cleansing”, or some other term, nothing is being done to stop the slaughter. By September 2004, the United States declared the Darfur crisis as genocide (VOA, 2004c) and the United Nations threatened sanctions against Sudan if the killing was not stopped. By October 2004, the U.S. provided US\$ 40 million in ground facilities and other services to African Union (AU) troops, including airlifting these troops, expected to grow from 300 to 3,000, into the area (Gollust, 2004; Heinlein, 2005b). A January 1, 2005 report by the UN International Commission of Inquiry on Darfur has refused to label what is happening as a genocide but states that this is “widespread and systematic” abuse that may constitute crimes against humanity (Lynch, 2005), following the same pattern that led to a million people being killed in Rwanda and Burundi in 1994 (see Chapter 13, Section 13.8.6, Former Cold War Allies Vying for Power in the Great Lakes Region). There is some talk of war tribunals.

By early August 2007, an estimated 200,000 Darfurians are dead and 2.5 million have fled there home. The UN Security Council has just approved a 26,000-

strong hybrid UN/African Union peacekeeping force for Darfur. With support from the African Union and the United Nations, eight rebel groups meeting in Arusha, Tanzania have agreed upon a common negotiating position for proposed peace talks with the Sudanese government. Some rebel groups have refused to participate. Of concern is the absence of Abdel Wahid Mohammed al-Nur, leader of the Sudan Liberation Movement/Army (SLM/A) and one of the founders of the Darfur uprising. He refuses to participate until UN troops are in place and there is a no-fly zone (Wadham, 2007a).

Meanwhile, at almost the same time a mega-underground aquifer has been found in Northern Darfur (Polgreen, 2007). Although not an issue at the moment in Darfur, concern exists that this may spur a form of government backed commercial agriculture (Polgreen, 2007) that elsewhere in Sudan has displaced traditional farmers and tenure systems in legalized land grabs, resulted in forced labor, and empowered external investors looking for a quick profit often resulting in abusive environmental and labor practices. Grants and interest free loans have been provided by the International Development Association (IDA), part of the World Bank (CIJ, 2006; Polgreen, 2007). This has resulted in massive deforestation as tree cover is cleared in the first year of mechanization and sold as charcoal. Conflicts with nomadic pastoralists are common as their traditional grazing areas go under the plow and are no longer available. In many instances this has resulted in soil mining and ultimately what some call “mechanized desertification”. Often local communities are left impoverished, never to recover psychologically or environmentally from exhausted land that will no longer produce agriculturally or provide vital resources (e.g., honey, wild fruits, game) once found in surrounding natural systems vital as nutritional supplements to itinerant agriculture. It is argued that over the last 15 years commercial farming has been a key military strategy to break communities considered hostile to the Sudanese government and to further the Islamization of the society (CIJ, 2006).

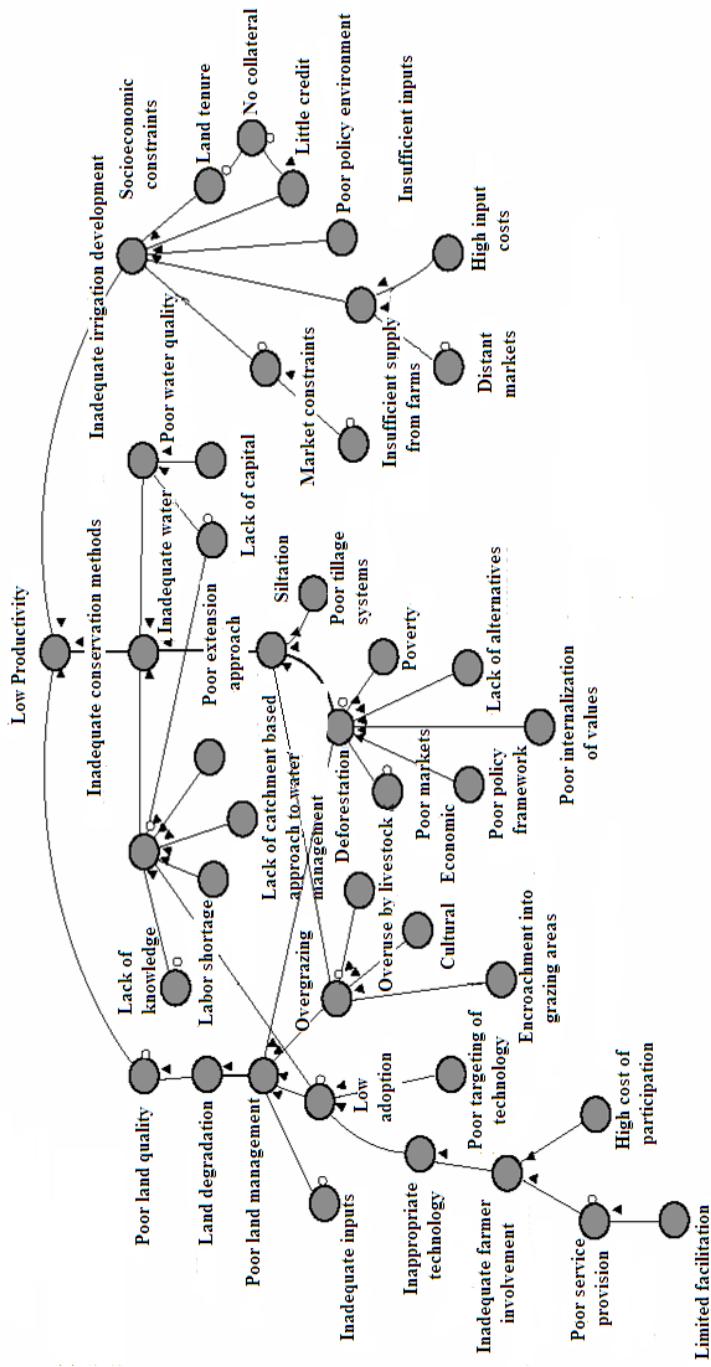
Will this underground lake be a source of continued conflict, or help solve this bloodshed? The Darfur conflict is a

“battle for control of resources and riches, but not between farmers and herders, northerners and southerners, Christians and Muslims, or Arabs and non-Arabs. It is a conflict between those at the center of the country, the elites who have controlled Sudan and its wealth for the past century and a half, and the desperately poor people who beg for scraps from the periphery” (Polgreen, 2007).

5.12 THE WAY FORWARD

Murwira (2004 *In:* Bationo, 2004) identifies key constraints to agriculture and rural development in Sub-Saharan Africa, which must be overcome (Figure 5.12). Eicher (1990 *In:* Eicher & Staatz, 1990) has identified four major classes of farmers in today’s Africa:

1. Resource poor farmers who are net buyers of food, who rent their family as laborers on other farms and who engage in rural non-farm activities as a means of generating income to purchase food;
2. Smallholders and herders relying mainly on family labor to produce food, livestock and export crops for domestic and international markets;
3. Middle “*progressive farmers*” who own and operate farms using oxen and hired labor and who are able to serve as innovator farmers to test and demonstrate new methods to poorer farmers; and
4. Large-scale farmers, a new emerging class coming out of the elite (soldiers, merchants, civil servants, and the new professional class) – often absentee farmers.



Source: Murwira (2004 *In: Bationo, 2004*) with permission, *Centro International de Agricultura Tropical* (CIAT).

Figure 5.12: Constraints to rural development and sustainable agriculture that must be overcome in Sub-Saharan Africa

He argues that different technological packages/arrangements will be needed depending on the type of farmer. Linked to these farmers are the “prime movers” necessary for African agricultural development (Eicher, 1990 *In:* Eicher & Staatz, 1990):

1. Favorable economic environment from an enabling political system – good governance, rule of law, etc.
2. Human capability and managerial skills – education;
3. New technologies and borrowing already existing technologies to improve production;
4. Rural capital formation, both physical (e.g., roads, grain storage facilities, dams, irrigation) and biological (e.g., improved livestock, and seed); and
5. Rural institutions such as those that provide credit, seed and marketing to/for the farmer.

“Food security is becoming or is already of paramount concern in many of the African nations. Traditional agriculture systems and declining 'aid' imports may not supply the needs of a region, which has some of the highest birth rates. A declining resource base will eventually contribute to civil unrest due to uncertain food supplies” (Eswaran, *et al.*, 1996) unless major steps are taken.

Africa will be faced with three major food strategies (Maxwell, 2001 *In:* Devereux & Maxwell, 2001a) (Table 5.26):

- **Growth First Strategy** – growing food on high potential lands, which may or may not be food crops.
- **Food First Strategy** – maximizing food output in high potential lands in favor of commercial crops such as coffee, tea, peanuts, wildlife and other cash crops.
- **Food Security First Strategy** helping the poor to acquire food by production, purchase or gift.

Table 5.26: Agricultural development/food strategies

Agricultural Development Strategy	Growth	Impact on Poverty Reduction	Food Import Reduction	Commercial Import Capacity	Reduction In Food Aid Need
Growth First	High	Medium	Medium	High	Medium
Food First	Medium	low	High	Medium	Low
Food Security First	Low	Low	Low	Low	High

Source: Maxwell (2001 *In: Devereux & Maxwell, 2001a*) with permission, ITDG Publishing/University of Natal Press.

The authors advocates a middle of the road approach tending towards the “Growth First Strategy”, which has the greatest potential to develop more jobs from the added value of transformation, assuming it takes place in African agro-industries, while providing people with the buying power to purchase food in both times of plenty and scarcity. It then becomes irrelevant in a global economy if food is produced locally or imported, as long as access to the food is available through local buying power by:

- Identifying high-yield lands and assuring they produce food and or transformable commercial crops depending upon the comparative advantage of the area in soils and climate. This may require “Green Revolution Technologies”. The decision to grow food or exportable produce will depend upon factors such as global grain supplies and national versus international tariffs and subsidies. The important factor is that there needs to be the wherewithal for the farmer to switch crop production, depending on supply and demand, to assure national/regional food security if global shortfalls become chronic, as some predict from a combination of factors such as population growth, global warming or declining soil fertility resulting in declining yields;

- Using transformation (agricultural, mineral, timber, wildlife, etc.) and industrialization to draw people off the land, especially marginal lands, into urban centers where these industries and eventually information technologies will provide employees with the buying power to purchase their food; and
- Working with traditional farmers in marginal areas, where the majority of Africa's population lives, to combine traditional land management with low cost soil enhancing techniques (described below) while continuing to experiment in increasing yields through improved crop varieties, inputs (fertilizers and pesticides) where they can be shown to be both economically and environmentally sustainable and other soil enhancement measures.

The authors are somewhat pessimistic about significantly increasing production on marginal lands, especially in savanna and forest areas where after spending billions of dollars over the past 40 years, no Green Revolution has taken place, and if possible, would likely only take place through subsidizing the costs of production, with costs outweighing benefits. Often soil moisture, fertility, chemistry and structure, as well as rainfall and other climatic factors are major constraints to increased production over much of Sub-Saharan Africa. Eicher (1990 *In: Eicher & Staatz, 1990*) as well as René Dumont (1966) are also pessimistic about increasing the productivity of staple foods in dry areas where there is a paucity of irrigation and a lack of profitable technology for the staple foods of sorghum and millet, as well as a lack of technical research on fruits and vegetables.

Maxwell (2001 *In: Devereux & Maxwell, 2001a*) believes that with proper national policies, the private sector will take over and run the high potential lands, while the state should work with the poor in low potential areas. At this point in

Africa's history, the private sector implies white Africans and/or foreign companies. There is a crying need to see commercial technologies transferred to black Africans. This is discussed in some detail below.

According to Nana-Sinkam (1995), the main technical options open to African governments to increase food production are:

- Land and optimal irrigation development or water policy in general;
- Increasing land and labor productivity with available technology;
- Developing additional technology to overcome production constraints that currently have no technical solutions; and
- Institutional framework including land tenure policy.

These options must be put into their proper perspective since misleading claims have been made for them. In fact, there are four myths about how these options can solve Africa's agricultural crisis. They assume, which is not the case, that Africa has (Nana-Sinkam, 1995):

- Huge areas of surplus land available, which is not true;
- Plenty of agricultural labor available, when urban migration and increasingly HIV/AIDS are creating labor shortages;
- There is a vast potential for irrigation; and that
- These can be married with the use of agricultural technologies that have been successful in Asia.

The 27% of land suitable for rainfed agriculture in Sub-Saharan Africa amounts to about 600 million ha of land; 663 million ha for all of Africa (FAO, 2003b). Soils without or having moderate constraints in Sub-Saharan Africa include:

	<u>Hectares (x 1, 000)</u>	<u>Percentage (%)</u>
West Africa:	163,843	28
Central Africa	142,059	24
East Africa	234,763	39
Southern Africa	<u>55,826</u>	<u>9</u>
	596,491	100
<u>North Africa</u>	<u>65,955</u>	
TOTAL	662,446	

Source: FAO (2003b)

Nana-Sinkam (1995) estimates that 600 million ha for the entire continent are suitable for rainfed agriculture in Africa.

As previously discussed in this chapter, much of the really good land is already under production, in fallow that is rapidly disappearing or in other land uses (see Section 5.51, Land Use Potential for Rainfed Agriculture in Africa and Section 5.9.2, Over-Population of Prime Agricultural Land for Low Input Agriculture is also Commercially Viable Land). Some is only suitable for tree crops and most is already in use for forestry or grazing (Nana-Sinkam, 1995), while some areas are over-populated by subsistence farmers. In some areas (e.g., Maasailand in Tanzania & Kenya), there are major decisions which will have to be made; will the high altitude grasslands remain as rainy season dispersal areas for wildlife and livestock, or will they be converted to cereal producing areas? Nana-Sinkam (1995) estimates that about 75% of reserve land available for crop production is located in three sub-regions (Table 5.20): Central Africa, where development will be held back by low population densities, and limited road and rail access; and East and Southern Africa, where 67% of the reserve lands have marginal soils and/or unreliable rainfall and are located mainly in four countries - Angola, Mozambique, Tanzania and Zambia. South Africa and Zimbabwe should be added to this list, though the current land reform policies have destroyed any hope in the near future of Zimbabwe serving as a breadbasket for Southern Africa. Ultimately, there is a need to identify prime agricultural land already in

production and assure that it remains so, while identifying prime land not in production and making plans to put it into production to feed the continent, unless it can be shown that other land uses (e.g., wildlife dispersal areas in East Africa) are economically and/or ecologically advantageous.

“Land frontiers are closing rapidly in the coastal zone of West Africa and in the densely populated moist and dry savannas, and to a lesser extent in Central Africa, agricultural intensification becomes a necessity in terms of higher yields per hectare, and land-use intensification in terms of shortening fallows” (IFAD 2001).

The Commission for Africa (2005) suggests that

“at present agriculture has just two focuses: growing crops for subsistence and for export to the industrialized world. If a third is added – to grow staple foodstuffs for those parts of Africa which have regular food shortages – then agriculture could bring growth to areas which could be breadbaskets. That would simultaneously redress the situation where at least 25% of the population is undernourished and close to half of African countries experience routine food crises. It would also reduce the need for food imports on the present scale – US\$ 22 billion worth of food with a food aid complement worth US\$ 1.7 billion in 2002. With an increasing population, markets in staple foods will be the fastest growing of all agricultural markets in Africa over the next 20 years”.

5.12.1 Technological Solutions to Africa Food Crisis and Land Degradation

“FAO estimates show that between 1995/7 and 2030 about 75% of the projected growth in crop production in Sub-Saharan Africa will (have to) come from intensification in the form of yield increases (62%) and higher cropping intensities (13%), with the remaining 25% coming from arable land expansion...If most of the nearly 70 million smallholder families in Sub-Saharan Africa (Sub-Saharan Africa) fail within the next decade to adopt sustainable integrated soil fertility and land and water management practices on their farms, they will seriously jeopardize their long-term food security,

productivity and incomes while environmental degradation will accelerate. Africa needs to address low farm productivity through integrated approaches combining increased use of organic matter, mineral fertilizers, hybrid seeds, irrigation or mechanization (including reduced tillage systems) rather than each in isolation” (NEPAD, 2002).

Land intensification requires more inputs/ha, particularly labor inputs. Agricultural and land-use intensification help to preserve the environment, including nature reserves, wetlands, fragile areas, game reserves and mangroves. Without intensification, such areas will be brought under extensive cultivation (IFAD, 2001). Application of the ‘*Green Revolution*’ strategy in Sub-Saharan Africa resulted only in minor achievements because of a variety of reasons. At the same time environmental degradation, resulting from massive applications of fertilizers and pesticides in Asia and Latin-America between the mid-1980s and early-1990s using Green Revolution technologies and the abolition of the fertilizer subsidies in Sub-Saharan Africa from structural adjustment policies (SAPs) led to a renewed interest in organic resources in the early 1980s. Management of soil productivity in Sub-Saharan Africa shifted from mineral inputs only to Low Mineral Input Sustainable Agriculture (LISA) where organic resources were believed to enable sustainable agricultural production. From the mid-1980s to the mid-1990s, there has been a paradigm shift towards the combined use of organic and mineral inputs (Vanlauwe, 2004 *In:* Bationo, 2004). Intensification will require improved production through adoption of Integrated Soil Fertility Management Technologies (ISFM) (CIAT, 2002):

- Integrated nutrient management (INM);
- Micro-dose use of fertilizers;
- Improved manure management;
- Inter-cropping systems;
- Integration of multi-purpose legumes;

- Improved fallow (e.g., shortened fallow with the addition of fertilizer – Dumont, 1966); and
- Biomass transfer of high quality organic inputs

Improved seed varieties will also be required. In many instances this implies integrating traditional technologies and knowledge (e.g., use of manure and traditional nitrogen fixing legumes, use of colonizing vegetation to know when fallow lands are recovered, etc.) with modern technologies.

However, for most African farmers, globalization of agricultural markets will make no significant difference to their livelihood opportunities until considerable improvements are made in infrastructure and marketing institutions. Modern, input-intensive farming is unlikely to be economically viable in much of rainfed Africa for at least another two to three decades, until rural infrastructure, markets, and agricultural input supply systems have caught up (Hazell, 2001) (see Section 5.12.1.8, Infrastructure technology as an incentive to increased agricultural production). The cost of getting nitrogen fertilizer to the farm gate in Africa is from 3-5 times higher than in North America and Europe (Hazell, 2001; Sanchez & Jama, 2002 *In: Vanlauwe, et al., 2002*) and the farmer receives only 30-60% of the market value for his/her products (Hazell, 2001). The principal author recalls being in an isolated village in the Fouta Djallon of Guinea-Conakry awash with mangoes but no way to get them to major market centers.

Agricultural intensification does not necessarily mean more external inputs, which may be damaging to the environment (IFAD, 2001). In the meantime, most of rural Africa, particularly small-scale farmers in rainfed areas, will need to look to lower cost alternatives to intensification such as Low External Input (LEI) farming technologies (Hazell, 2001; Madeley, 2002).

5.12.1.1 Integrated nutrient management (INM)

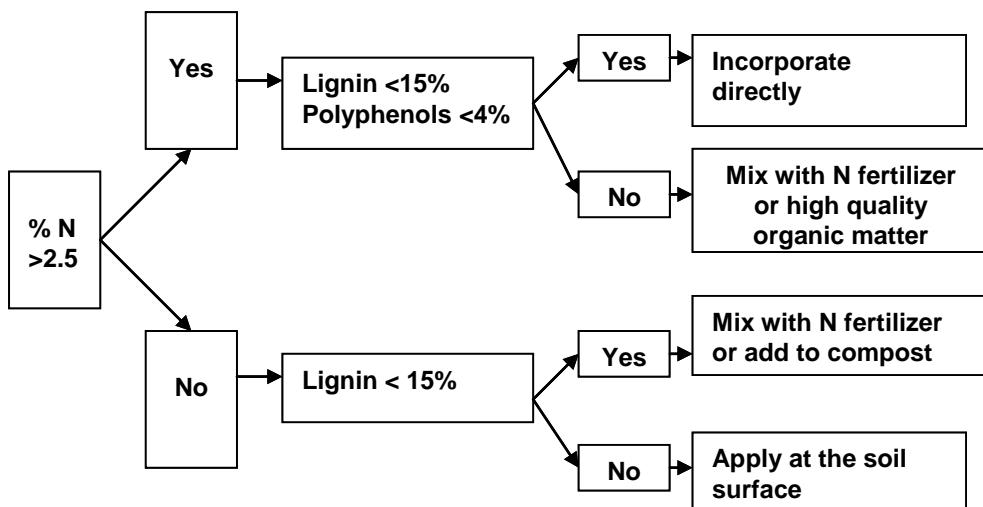
Gruhn *et al.* (2000) believe that fertilizer use in Sub-Saharan Africa is too low due to highly insecure supplies, and a high aversion to the risks by farmers with food production in marginal agro-climatic and socioeconomic conditions. As long as agriculture remains a soil-based industry, increased crop yields will require an adequate and balanced supply of nutrients. Integrated Nutrient Management (INM), a form of Low External Input (LEI) farming, maintains soils as storehouses of plant nutrients that are essential for vegetative growth. INM's goal is to integrate the use of all natural and man-made sources of plant nutrients, so that crop productivity increases without sacrificing soil productivity of future generations.

While plants have no preference of mineral versus organic fertilizers, the microorganisms needed to maintain healthy soil conditions prefer organic fertilizers (Sanchez & Jama, 2002 *In:* Vanlauwe, *et al.*, 2002). Sanchez and Jama (2002 *In:* Vanlauwe, *et al.*, 2002) argue that a combination of mineral and organic fertilizers could help to significantly improve soil fertility in certain areas of East and Southern Africa. Soil conservation technologies prevent the physical loss of soil and nutrients through leaching and erosion and fall into three general categories (Kumwenda, Waddington, Snapp, Jones & Blackie, 1996 *In:* Gruhn, *et al.*, 2000; Hazell, 2001):

- Terracing, alley cropping, and low-till farming alter the local physical environment of the field and thereby prevent soil and nutrients from being carried away;
- Mulch application, cover crops, inter-cropping, crop rotations, and biological nitrogen fixation act as physical barriers to wind and water erosion and help to improve soil characteristics and structure;

- Organic manures such as animal and green manures also aid soil conservation by improving soil structure and replenishing secondary nutrients and micronutrients; and
- Lower cost locally produced phosphate fertilizers.

Vanlauwe (2004 *In:* Bationo, 2004) provides a Decision Support System (DSS) for organic matter based upon resource quality parameters including macronutrient, lignin and polyphenol contents of fresh leaves, litter, stems and/or roots from almost 300 species found in tropical agro-ecosystems (Figure 5.13). DSS makes practical recommendations for the appropriate use of organic materials, based on their nitrogen (N), polyphenol,⁹² and lignin⁹³ contents, resulting in four categories of materials. DSS recognizes the need for certain organic resource to be applied together with mineral inputs.



Source: Palm, Gachengo, Delve, Cadisch and Giller (2001 *In:* Vanlauwe, 2004 *In:* Bationo, 2004) with permission, CIAT.

Figure 5.13: Decision support system (DSS) for organic matter management in soils

⁹² Vegetable substances with one or more phenolic group, giving plants colors, reacting to produce gelatins, alkaloids and other proteins, having anti-oxidant activity.

⁹³ Phenolic compound impregnating and strengthening cell walls in plants giving wood its stiffness

This will result in optimum management of soil resources including, organic and mineral inputs, as well as Soil Organic Matter (SOM) (Vanlauwe, 2004 *In: Bationo, 2004*).

The pros and cons of different techniques used in organic matter management, which also can enhance nutrient inputs are contained in Table 5.27 (Vanlauwe, 2004 *In: Bationo, 2004*).

Cereals grown in rotation with leguminous plants can absorb the nitrates released from the decaying roots and nodules of the leguminous plants. Experiments have shown that rice-legume rotations can result in a 30% reduction in chemical fertilizer use (Pingali & Rosegrant, 1994 *In: Gruhn, et al., 2000*). Madeley (2002) considers most of these technologies as “traditional” which can be lost within one generation of being pushed into using “modern agricultural” but not necessary cost-effective technologies for the scale of farming and physical/chemical conditions. Thus, these “traditional farming technologies” may have to be relearned. Examples of these traditional systems are briefly highlighted in Chapter 2.

Table 5.27: Pros and cons of different techniques used in organic matter management

Place and time of organic matter production – example of farming system	Advantages	Disadvantages
Same place same time -Alley cropping	-Safety net hypothesis (complimentary rooting systems) -Possible direct transfer from N ₂ fixed by legume species	-Potential competition between crop and fallow species -Reduction of available crop land
Same place different time -Crop residues -Legume-cereal rotation -Improved tree fallows -Manure, derived from livestock fed from residues collected from field	-Rotation effects (N transfer, improvement of soil P status) -Potential inclusion of dual purpose legumes -In-Situ recycling of less mobile nutrients -No competition between fallow species & crops	-Land out of crop production for a certain period -Decomposition of organic matter may start before crop growth (potential losses of mobile nutrients, e.g., N, K...) -Extra labor needed to move organic matter (manure)
Different place -Cut & carry systems -Household waste -Animal manure, not originating from same field	Utilization of land/nutrients otherwise not used -No competition between fallow	-Extra labor needed to move organic matter -No recycling of nutrients on crop land -Need for access to extra land -Manure & household waste often low quality

Alley cropping is an Agroforestry practice in which a row of crops are grown between rows of leguminous shrubs/trees in whose roots bacteria fix atmospheric nitrogen making it available to other plants as fertilizer.

Source: Vanlauwe (2004 *In:* Bationo, 2004) with permission, CIAT.

Low-Input Agriculture in Ethiopia

Ethiopia with 700,000 small scale farmers growing coffee is Africa's third largest exporter of this commodity behind the Ivory Coast and Uganda. Ethiopia exported about 2 million 60 kg bags in 2000, accounting for 65% of its Foreign Exchange (FOREX) while capturing about 2.3% of the global coffee market. About 95% of Ethiopia's coffee is grown without fertilizers or pesticides. Pests are controlled through traditional farming practices such as inter-cropping, while green mulches are used to maintain fertility. As a result, this organically grown coffee brings higher prices for those officially certified farmers (Madeley, 2002)

(see Chapter 13, Section 13.13, TRADE NOT AID and Section 13.13.2, Transform Products Unique to Sub-Saharan Africa).

Nutrients and Legumes to Increase Agricultural Production in West Africa

In West Africa, farmers traditionally use the nitrogen fixing *Acacia albida*, along with cattle manure, burning and fallow to maintain soil productivity. In pre-colonial Senegal, it was considered a grievous crime punishable by death to cut down designated *Acacia (Faidherbia) albida* trees in agricultural fields, strategically placed to improve crop production (Samba, *pers. comm.*). In tropical West Africa, nitrogen and phosphorous tend to be limiting to agricultural production. Going from arid to humid regions, the concentrations of these parameters tend to increase. N-deficiency is more important in the dry zone, while P-deficiency is more important in the wetter zones. As rainfall increases, so does the production of vegetation/organic matter and thus the availability of nitrogen. However, in the higher rainfall areas, soils become more leached, more acidic and P-availability becomes more limited by iron, aluminum or manganese toxicity (Breman & van Reuler, 2002 *In: Vanlauwe, et al., 2002*) (see Section 5.5.2.3 Nutrients, pH, acidity and carrying capacity). This concurs with Dusal (2002 *In: Vanlauwe, et al., 2002*) who states that the use of phosphate rock (PR) outside the acid soils of humid and moist sub-humid zones (where nitrogen is abundant) of Africa will have little impact due to nitrogen limitations.

N-deficiency is such a widespread problem that legumes, which fix nitrogen, could be useful almost everywhere in West Africa, nitrogen deficiency being more of a severe bottleneck/limiting factor to production than is the low availability of phosphorous in the soils. As a result, the contribution of legumes to the annual production of the herb layer of natural vegetation and rangelands is only about 5% (Breman & van Reuler, 2002 *In: Vanlauwe, et al., 2002*).

Legumes can partially satisfy the requirements of non-nitrogen fixing crops, the theoretical maximum being 50% (Breman & van Reuler, 2002 *In: Vanlauwe, et al.*, 2002).

The *tapades*⁹⁴ of Guinea-Conakry use green manure. In West and Central Africa, improved fallow management and the use of leguminous cover crops, mulches (live or dead) or agro-forestry species show a lot of promise. One major success is the use of *Mucuna* (leguminous cover plant) in southern Benin for the suppression of the pest *Imperata* (spear grass) and to improve soil fertility. Other examples are the use of pigeon peas, *Cajanus cajan*, in fallows and short rotation fallows with cowpea, *Vigna unguiculata*, in the dry savanna. Getting improved on-farm tested technology adopted by farmers is a key to productivity improvement and better NRM (Natural Resources Management) (IFAD, 2001). Leguminous groundnuts, common in West Africa are another example.

Biophysical limitations to this are 1) leguminous fallows do not work well in shallow soils and have not been adequately tested in poorly drained or Vertisols and 2) there are no leguminous fallow species or an analogue of *Tithonia rotundifolia* (Mexican sunflower)⁹⁵ that can replenish nitrogen fertility in semi-

⁹⁴ See Section 5.9.3.2, Loss of fallow turning wildlife into a short-term resource, Fouta Djallon Mountains, Guinea-Conakry, describing gardens around the house where women grow the bulk of vegetables.

⁹⁵ *Tithonia spp.* is used in the humid and sub-humid tropics of Sub-Saharan Africa at elevations of 500-2,000 m. Small-scale farmers in Kenya, Uganda, Tanzania, Zimbabwe, Malawi and Mozambique have adopted technology packages combining *Tithonia*, phosphate rock and leguminous (nitrogen fixing) fallows. The leaves are extremely high in nutrients. In western Kenya, analysis of nutrients as a % of dry matter in green leaves was found to be on the order of 3.5-4% nitrogen (N), 0.35-0.38% phosphorus (P), 0.59% calcium (Ca) and 0.27% magnesium (Mg). This richness in nutrients is believed to be due to deep roots and the secretion of citric acid to its rhizosphere (area of soil immediately around a plant's roots) solubilizing some soil nutrients. *Tithonia* is typically mixed with other hedge species along farm boundaries (Sanchez & Jama, 2002 *In: Vanlauwe, et al.*, 2002). The leaves of *Tithonia* are used as green manure (Jama, Palm, Bruesh, Niang, Gachengo, Nziguheba & Amadalo, 2000). *Tithonia* biomass has been shown to double maize yields without application of mineral fertilizers. It represents a redistribution of nutrients from within the farm as opposed to an introduction from outside, meaning that

arid areas (e.g., the Sahel) (Sanchez & Jama, 2002 *In: Vanlauwe, et al.*, 2002). Thus, these techniques are best used in the sub-humid well-drained “red soils” of East and Southern Africa and should work in the sub-humid areas of West Africa (Sanchez & Jama, 2002 *In: Vanlauwe, et al.*, 2002). However, as discussed, *Acacia albida* appears to have similar qualities (Franklin, Martin & Sherman, 1992; Winrock International, 1995) and is useful in the drier Sahelian soils.

For instance, in the savanna zone of West Africa with low rainfall (500 - 1000 mm annually), base leaching is limited; hence soils have a relatively high pH (pH 6.0 to 6.5). However, soil acidity may rapidly increase with farmers’ cultural practices, such as reduced fallow due to population growth, intensive cropping, nutrient losses by erosion and runoff, and cations Ca^{2+} and Mg^{2+} losses associated with nitrate leaching. Thus, acidification of cultivated soils and P-deficiency due to high P-fixation could adversely affect crop yields.

“Considering P deficiency and soil acidification induced by farmers’ practices, organic amendments, rock phosphates and dolomite are interesting alternatives that could be exploited to improve traditional farming system productivity in Sub-Saharan Africa” (Bado, Sedogo & Lombo, 2004 *In: Bationo, 2004*).

Experiments in Ghana and Niger have demonstrated that by increasing the longevity and productivity of suitable agricultural land, the application of inorganic and organic fertilizer reduces the need to cultivate unsustainable and fragile marginal lands (Vlek, 1993 *In: Gruhn, et al.*, 2000). The extension of LEI/INM techniques to small-scale farmers may be critical in helping to stem the tide of expansion onto marginal land such as critical wildlife and livestock habitat, and as a result may help minimize the growing conflicts between pastoralists and small-scale farmers across the subcontinent.

eventually, as crops such as maize absorb these nutrients, external inputs would be required (Sanchez & Jama, 2002 *In: Vanlauwe, et al.*, 2002).

Mitigation of Nutrient Mining in the Groundnut Basin of Senegambia, West Africa

The Groundnut Basin of Senegal (Gambia being an extension) has not benefited from the Green Revolution as much as regions well endowed with water resources. The zone occupies 65,000 km² (1/3 or 33% of the country's area) and is one the most important agricultural regions of Senegal (71% of the total crop production). At similar Sudanian (600-800 mm rainfall) sites in Kaolack, Senegal and the Gambia, the loss of nutrients through nutrient mining is continuing. Technologies that result in greater yields without being "nutrient balance positive" only exacerbate the problem. The loss of soil organic matter, a property critical to fertility, water-holding capacity, microorganism livelihood, and to the moderation of temperature extremes, continues unresolved. Possibilities of using indigenous vegetation to restore soil fertility are promising, but have not been examined in realistic situations. Virtually all studies done in West Africa have shown that the factor most commonly limiting grain production is the supply of phosphorus. A combination of animal manure and inorganic nitrogen can lead to yield increases that are sustained longer than the use of inorganic nitrogen alone. Rotation of crop legumes with cereals can also significantly increase cereal production (InterCRSP, 1997).

On a pilot farm in Senegal and believed to be typical of the region, estimates of food sufficiency (millet as the staple) for the village are that only 20% of the households are likely to be food-sufficient, the remainder relying on imports. Food can be deficient for periods as long as seven months. Decline in crop fertility over the last five years is attributed to low fertility of soils, decline in rainfall, invasion of cropland by parasitic weeds (*Striga*) and the lack of fertilizers, wind and rain erosion, and elimination of fallow. Crop responses to

inputs such as fertilizers are generally low and unprofitable for the farmer
(InterCRSP, 1997).

“In the southeastern Peanut Basin (Groundnut Basin) of Senegal millet grown with manure continues to be 12% more profitable than millet grown with recommended doses of fertilizer and 58% more profitable than millet grown without fertilizer. In the central Peanut Basin, millet grown with manure continues to be 36% more profitable than millet grown with fertilizer and 43% more profitable than millet grown with no fertilizer. Unfortunately, manure is extremely limited and the somewhat greater profitability of the fertilizer technology over the non-fertilizer technology (36% in the southeast and 5% in the center) does not appear to provide adequate incentive for farmers to use fertilizer in the risky Sahelian environment” (Diagana & Kelly, 1996).

Farmers cope through youth labor migrations to urban centers, and thus remittances. Increases in crop yields may be obtained from a sequential application with rock phosphate applied to the very acid soils (e.g., pH<5.5), and phosphogypsum - a by-product of phosphate mining also containing calcium and sulphur, applied to those soils with higher pH, to the drier soils, and to those with lesser soil P buffering capacity. Crop residues are all used for feeding animals and nothing is available to restore soil organic matter. Farmers usually leave *Cordyla pinnata* and *Piliostigma thonningii*, which are leguminous shrubs/trees in the crop fields. The density can reach 600 to 700 shoots/ha (InterCRSP, 1997).

In the Gambia, fallow land has disappeared resulting in a loss of soil structure and causing reduced infiltration and increased runoff. Harvest of groundnuts disturbs the soils, the “hay” being used for forage, leaving bare ground susceptible to wind and water erosion. More fields were observed with purple (witchweed) striga (*Striga hermonthica*) flowers in this area than anywhere on the survey, suggesting as an indicator species that these soils were exhausted and severely mined of nutrients and probably very acid. Trials are being run comparing the effects of

two sources of manure (cow and horse dung) and different levels of phosphorus, alone or combined with the cropping system (peanut/millet) (InterCRSP, 1997).

In 1996, following the World Food Summit, a consortium of seven research institutions launched a Soil Fertility Initiative (SFI) for Sub-Saharan Africa: 1) UN Food and Agricultural Organization (FAO), 2) the International Centre for Research in Agroforestry (ICRAF), 3) the International Fertilizer Industry Association (IFA), 4) the International Fertilizer Development Centre, 5) the International Food Policy Research Institute (IFPRI), 6) U.S. Agency for International Development (USAID) and 7) the World Bank. The SFI will look at not only nutrient replenishment, but the overall biological and physical characteristics which determine the ability of the soils to supply water to the plants, the interaction with soil fertility to other inputs, the economic feasibility (often the major constraint) to improved practices, and the availability and accessibility of sources of plant nutrients (Dudal, 2002 *In: Vanlauwe, et al.*, 2002).

Integrated Nutrient Management (INM)/Low External Input (LEI) Agriculture in East and Southern Africa

The combined nitrogen fixation with leguminous plants (e.g., *Sesbania sesban*, *Tephrosia spp.*, *Crotalaria spp.*, *Gliricidia sepium*, and *Cajanus cajan*/pigeon pea) during fallow periods of two to three years to supply nitrogen, combined with locally produced phosphate rock (PR – as an alternative to expensive imported super phosphate fertilizers that are only affordable to small-scale farmers if subsidized) and shrubs of the *Tithonia rotundifolia* (Mexican sunflower) and *Lantana camara*, whose leaves provided nitrogen, phosphorus, potassium, calcium and magnesium, resulted in increases from two to six times the normal 1 ton/ha yield of maize.

“Pigeon pea root exudates have been found to contain phenolic compounds (e.g. piscidic acid), which chelate Fe (iron)⁹⁶ to free P in Fe bound P in soils for crop uptake. It is also reported that pigeon pea root exudates dissolve phosphate-containing rocks (e.g. phosphate rocks) to make P available for crop use” (Yeboah, Fening & Ampontuah, 2004 *In:* Bationo, 2004).

It is estimated that tens of thousands of small-scale farmers in Kenya, Uganda, Tanzania, Zambia, Malawi, Mozambique and Zimbabwe are adapting this form of soil enrichment (Sanchez & Jama, 2002 *In:* Vanlauwe, *et al.*, 2002). In Zambia, improved fallow technology using:

“sesbania and pigeon pea have a potential to supply inorganic soil nitrogen through leafy biomass and litter. The nitrogen contribution of sesbania and pigeon pea fallows to subsequent crop was evidenced by increased maize yields after these fallows as compared to no tree treatments. Improved fallows have the potential of improving soil physical conditions as compared to maize mono-cropping systems as shown from high soil aggregation, greater water infiltration, higher soil water sorptivity and reduced resistance to penetration” (Chirwam, *et al.*, 2004 *In:* Bationo, 2004).

IFAD (2002) has identified technologies that focus on improved management of natural resources, particularly water and soil, and are, by and large, not input intensive (e.g., capital intensive):

- **Bana Grass** (*Pennisetum sp.*), grown on contour ridges, to prevent soil erosion and provide fodder for animals;

⁹⁶ Also called sequester, a process of binding heavy metals that prevents heavy metals from combining with other elements, thus freeing up nutrients such as phosphorus either in the plant and/or the soil for plant production

- **Cowpeas** (*Vigna unguiculata*), grown in association with maize, as a food-security crop, to fix nitrogen and, through improved ground coverage, reduce weed growth and soil erosion;
- **Alternative Tillage Techniques** to reduce erosion, improve water retention and, in some cases, reduce labor and draft-power requirements (tied ridging, minimum tillage, etc.);
- **Production and Utilization of Drought-Resistant Food-Security Crops** – cassava and sweet potatoes – in association with pigeon peas as a food, cash and fodder crop to increase soil fertility (none of which are widely grown in Zimbabwe);
- **Live Fencing**, to reduce deforestation, degradation of communal lands, and labor requirements and to improve livestock management;
- **Use and Appropriate Application of Manure and Ant (Termite) Heaps** to improve soil fertility and structure; and
- **Improved Dambo (Low Lying Wetlands) Management**, to reduce soil erosion, increase water retention, control grazing, and thus permit intensified and sustainable production.

5.12.1.2 Green Revolution technologies

It took nearly 1,000 years for wheat yields to increase from 0.5 to two metric tons/ha, but only 40 years to climb from two to six metric tons/ha. A 1967 report of the U.S. President's Science Advisory Committee concluded that “ ‘the scale, severity and duration of the world food problem are so great that a massive, long-range, innovative effort unprecedented in human history will be required to master it’ ” (IFPRI, 2002). The Rockefeller⁹⁷ and Ford⁹⁸ foundations established

⁹⁷ The Rockefeller Foundation, 420 Fifth Avenue New York, NY 10018, Tel: 212.869.8500, www.rockfound.org

an international agricultural research system to transfer and adapt scientific advances to developing countries. In 1968, U.S. Agency for International Development (USAID) Administrator William S. Gaud coined the term “Green Revolution” to describe this phenomenal growth in agriculture (IFPRI, 2002).

To achieve higher yields for rice and wheat, scientists needed to develop plants that were more responsive to plant nutrients, had shorter, stiffer straw to support the weight of heavier heads of grain, and that could mature quicker and grow at any time of the year permitting farmers to grow more crops each year on the same land. The International Rice Research Institute (IRRI) in the Philippines developed semi-dwarf varieties of rice, while Norman Borlaug, “father of the Green Revolution”, developed new varieties of wheat. High-Yielding Varieties (HYVs) have since been developed for sorghum, millet, maize, cassava and beans (IFPRI, 2002).

“Green Revolution” technology relies on high input/high output technologies such as irrigation, fertilizers and genetically modified seeds. This often relies on heavy subsidies, many of which have fallen away, as discussed, with World Bank IMF structural adjustment policies (SAPs). There are often major environmental costs to increasing food production through intensification (e.g., reduced fallow, double cropping, irrigation – soil salinization, intensive use of fertilizers, adverse impact on soil structure and chemistry, pesticides – pest resistance, and environmental pollution) (Maxwell, 2001 *In: Devereux & Maxwell, 2001a*).

Agricultural crossbreeding has been implemented since about 8,000 BC. Today, 34% of American corn is genetically modified (GM), as are 78% of U.S. soybeans. Some 3,500 international scientists, including 20 Nobel laureates, have

⁹⁸ Ford Foundation, Headquarters), 320 East 43rd Street, New York, NY 10017 USA,
Tel: (212) 573-5000 , fax: (212) 351-3677, www.fordfound.org, office-of-communications@fordfound.org

signed the AgBio World Foundation's "Declaration of Support for Agricultural Biotechnology" (Murdock, 2003). American researchers such as Chassy (2002) and Harlander (2002) believe that research has shown genetically modified crops to be safe, something that has not been demonstrated with traditional crops. Yet GM crops remain controversial and emotive.

Almost all of the world's major crops are now being improved using genetic engineering, although initial efforts have focused on commodity crops — primarily corn, soybeans, cotton, canola and potatoes. However, there are many other crops, including other cereal grains and a number of vegetables and fruits that have been improved using genetic engineering and are in the commercialization pipeline (Harlander, 2002).

Genetic Research

Norman Borlaug (2002) has noted a need for research to work with improving yields from indigenous crops. Borlaug (2002), working with groups like the Sasakawa Foundation, is developing improved technology for basic food crops: maize, sorghum, wheat, cassava, rice, and grain legumes. Researchers at Purdue University in the USA are working with high-yielding sorghum varieties and hybrids with resistance to the heretofore-uncontrollable parasitic weed, *Striga spp.* Cereal varieties are being developed with greater tolerance for soil alkalinity, free soluble aluminum and iron toxicities. These varieties help to ameliorate the soil degradation problems that have developed in many existing irrigation systems. They also have allowed agriculture to succeed in tens of millions of hectares with highly leached acid soils.

Genetic engineering offers the potential for plants themselves to generate some of the nutrients they require through nitrogen fixation. In this process, rhizobium

bacteria infect, invade, and draw energy from leguminous plants, and in return the bacteria convert and store atmospheric nitrogen in a form that the plant can use for growth (Rao, 1993 *In: Gruhn, et al.*, 2000).

The Downside of the Green Revolution

The negatives are many, the question being whether the benefits outweigh the costs?

A major shortcoming of the “Green Revolution”, over a large part of soil moisture and water limited Sub-Saharan Africa, is that it is heavily dependent upon irrigation (potential of 42.5 million ha for all of Africa, (see Table 5.29: Environmental impact assessment of irrigation, by basin in Africa) and high-potential rainfed areas (27% of Sub-Saharan Africa \approx 600 million ha). Sub-Saharan Africa has yet to experience a “Green Revolution” (IFPRI, 2002).

IFPRI (2002) also states that while small-scale farmers initially lagged behind large farmers in adopting “Green Revolution” technologies, many of them eventually did so.

“Many of these small-farm adopters benefited from increased production, greater employment opportunities, and higher wages in the agricultural and non-farm sectors. Moreover, most smallholders were able to keep their land and experienced significant increases in total production. In some cases, small-scale farmers and landless laborers actually ended up gaining proportionally more income than larger farmers, resulting in a net improvement in the distribution of village income...The Green Revolution has also been widely criticized for causing environmental damage. Excessive and inappropriate use of fertilizers and pesticides has polluted waterways, poisoned agricultural workers, and killed beneficial insects and other wildlife. Irrigation practices have led to salt build-up and eventual

abandonment of some of the best farming lands. Groundwater levels are retreating in areas where more water is being pumped for irrigation than can be replenished by the rains. And heavy dependence on a few major cereal varieties has led to loss of biodiversity on farms" (IFPRI, 2002).

IFPRI (2002) argues that much of this environmental degradation can be linked to inadequate agricultural extension to illiterate farmers on the appropriate use of technologies, and subsidies that encourage the overuse of "cheap" inputs. The authors would argue that subsidies to support agricultural research and extension, as well as inputs may be required to maintain productivity and competitiveness (see Chapter 12). On the positive side they, note that more intensive farming using Green Revolution technologies has helped decrease the need to expand into forested lands and other fragile environments.

Brown (2003a) questions how much additional yield increases from GM crops can be expected,

"After climbing from 1.1 tons/ha in 1950 to 2.8 tons/ha in 2002, the world grain yield has reached a level where it is becoming more difficult to sustain a continuing rapid rise...At the center of the tripling of world grain production (1950-2000) during the last century were high-yielding varieties, the dwarf wheats and rices developed originally in Japan and hybrid corn from the United States. Under favorable conditions, these varieties could double, triple, even quadruple the yields of traditional varieties. But there are no new varieties in the pipeline that can lead to similar quantum jumps in yields. Nearly two decades have passed since the first genetically modified crop varieties were released, yet biotechnologists have yet to produce a single variety of wheat, rice, or corn that can dramatically raise yields (beyond what they already have). Nor does it seem likely that they will, simply because plant breeders, using conventional breeding techniques, have already taken most of the obvious measures to get the big jumps in yields.

Helping to realize the genetic potential of the new high-yield varieties was the growth in irrigation, which expanded from 94 million ha in 1950 to 272 million (ha) in 2000, raising the share of the world's grain harvest from irrigated land to 40%. Now growth in the irrigated area is slowing as many countries lose irrigation water from aquifer depletion and its diversion to cities.

As high-yielding varieties spread and irrigated area expanded, fertilizer use climbed from 14 million tons in 1950 to 137 million tons in 2000—a tenfold gain. While irrigation was removing the moisture constraints on crop yields, fertilizer was removing nutrient constraints. Then diminishing returns set in and the growth in fertilizer use slowed markedly.

...Much of the impressive gain in yields came as scientists boosted the share of photosynthate going to seed from 20% in traditional varieties to over 50% in modern high-yielding grains, close to the theoretical limit. Efforts to raise yields further are starting to push against the physiological limits of plants. In many countries, the rise in yields is slowing and in some it is leveling off.

The rise in grain yields will likely slow further during this decade. In addition to the shrinking backlog of technology to draw upon, many farmers also must deal with a loss of irrigation water, and farmers worldwide are facing the prospect of record-high temperatures—all of which could make it difficult to sustain a steady rise in land productivity. Although the rise in yields is slowing, there are still many opportunities for increasing yields, but in most situations the potential for doing so is modest”.

Eicher (1990 *In: Eicher & Staatz, 1990*) believes that there are political, scientific, technical and economic reasons that explain why it is proving difficult to develop new Green Revolution food crop technology that is high yielding, biologically stable and profitable for smallholders in Africa. To overcome these constraints will require: 1) strengthening national agricultural research systems supplementing Consultative Group on International Agricultural Research (CGIAR), 2) becoming more efficient at borrowing already existing technologies, and 3) CGIAR and donors devoting more attention to the scientific and

managerial capacity of national agricultural research systems. FAO (2002a) suggests that for a second Green Revolution, research must give priority

“...to the needs of the poor in the marginal, rainfed areas bypassed by the first Green Revolution”, something discouraged under IMF/World Bank Structural Adjustment Policies (SAPs) (see Chapter 12, Section 12.4.5, Decline in Research and Extension as a Result of Structural Adjustment).

Another problem is that the for-profit agro-industries who develop GM seeds very often use what is called “terminator” technology meaning that F1 (first) generation seeds must be bought each year in order to maintain high yields, as opposed to the farmer saving seeds from the F2 (second) generation and re-sowing them, thus engendering strong opposition by small-scale farmers. Also, concern has been raised that widespread mono-culture production of GM crops could result in the loss of local biodiversity/genetic varieties, and even result in genetic pollution with cross-breeding and the out-crossing of undesirable traits to the wild relatives of the GM crops (Paarlberg, 1999 *In:* Moorehead & Wolmer, 2001 *In:* Devereux & Maxwell, 2001a; Eicher, 1990 *In:* Eicher & Staatz, 1990; Eswaran, Arnold, Beinroth & Reich, 1999b *In:* Eswaran, *et al.*, 2003; Madeley, 2002), (see Chapter 12, Section 12.4.4.2, Impacts of structural adjustment on peasant production systems, impacts of structural adjustment on central Ghana cash crop economies, fallow and virgin forests).

Madeley (2002) raises concern of a few Transnational Corporations (TNCs) or – multi-nationals) with their GM patents “controlling the food chain”. Four multi-national biotech companies, DuPont, Syngenta, Monsanto and Mitsui own 44% of the patents for the world’s most important staple food crops of rice (613 patents), maize (999), wheat (1,495), soybean (750), potato (81) and sorghum (17) (Madeley, 2002). Concern also exists that this GM technology, requiring the use of expensive fertilizers and pesticides does not always result in higher yields,

especially in the marginal lands over much of Sub-Saharan Africa that have other constraints (e.g., soil moisture, soil acidity, etc. – see Section 5.5.2, Physical and Environmental Constraints to Overcoming Food Production in Sub-Saharan Africa), and thus are not only unaffordable but technologically inappropriate other than on prime agricultural lands run on a commercial basis. Hans Herren, Director-General of the International Centre of Insect Physiology and Ecology in Nairobi does not see GM crops making an impact on food production in Africa for the next 15-20 years (Madeley, 2002).

Few of the packages available from other parts of the world, including those for millet and sorghum, have been immediately suited to Sahelian growing conditions (Madeley, 2002). The Green Revolution also ignored traditional crops, the staples of poor farmers, leading to a movement away from the more appropriate, drought-resistant indigenous crops such as millet and sorghum to a maize mono-culture. This resulted in the growing concentration of ownership of land and resources in the hands of an elite and a focus on cash crops (Roman, 2003).

Green Revolution, Asia

As a result of the “Green Revolution”

“yields of rice and wheat virtually doubled. Higher yields and profitability also led farmers to increase the area of rice and wheat they grew at the expense of other crops. And with faster-growing varieties and irrigation, they grew more crops on their land each year. These changes more than doubled cereal production in Asia between 1970 and 1995, while population increased by 60%. Instead of widespread famine, cereal and calorie availability per person increased by nearly 30%, and wheat and rice became cheaper” (IFPRI, 2002).

“The Green Revolution led to sizable increases in returns to land, and hence raised farmers’ incomes. Moreover, with greater income to spend, new needs for farm inputs, and milling and marketing services, farm families led a general increase in demand for goods and services. This stimulated the rural non-farm economy, which in turn grew and generated significant new income and employment of its own. Real per capita incomes almost doubled in Asia between 1970 and 1995, and poverty declined from nearly three out of every five Asians in 1975 to less than one in three by 1995. The absolute number of poor people fell from 1.15 billion in 1975 to 825 million in 1995 despite a 60% increase in population...The Green Revolution also contributed to better nutrition by raising incomes and reducing prices, which permitted people to consume more calories and a more diversified diet. Big increases occurred in per capita consumption of vegetable oils, fruits, vegetables, and livestock products in Asia” (IFPRI, 2002).

Vandana Shiva,⁹⁹ an Indian scientist and activist, claims that the Green Revolution, despite giving more grain per unit, yields only 6 units of energy for every 15 expended in its production and requires a lot more water. The Green Revolution has left behind diseased and exhausted soils, pest-infested crops, waterlogged areas, deserts and indebted and impoverished farmers (Legum, 2002).

⁹⁹ Trained as a physicist and did her Ph.D. on the subject “Hidden Variables and Non-locality in Quantum Theory” from the University of Western Ontario. She later shifted to inter-disciplinary research in science, technology and environmental policy, which she carried out at the Indian Institute of Science and the Indian Institute of Management in Bangalore. In 1982, she founded an independent institute, the Research Foundation for Science, Technology and Ecology in Dehra Dun dedicated to high quality and independent research to address the most significant ecological and social issues of our times, in close partnership with local communities and social movements. In 1991, she founded *Navdanya*, a national movement to protect the diversity and integrity of living resources, especially native seeds. Dr. Shiva has contributed in fundamental ways to changing the practice and paradigms of agriculture and food. Her books, “The Violence of Green Revolution” and “Mono-cultures of the Mind” have become basic challenges to the dominant paradigm of non-sustainable, reductionist Green Revolution agriculture. Address: Director, Research Foundation for Science, Technology and Ecology A-60, Hauz Khas, New Delhi – 110 016 Tel: 91-11-26968077 & 26853772, Fax: 91-11-26856795 and 26562093 Email: vshiva@giasdl01.vsnl.net.in. Extracted from http://www.vshiva.net/vs_cv.htm, Short Curriculum Vitae of Dr. Vandana Shiva.

“The high yields of rice and wheat in India’s and Pakistan’s 1960s “Green Revolution” is near an end. High yielding varieties of hybrid rice and wheat depended on high and dependable applications of water, and high inputs of fertilizers and pesticides. However, since the 1970s the spread of irrigation has dramatically declined because the most fertile lands, the most accessible sources of waters and the best dam sites have already been developed, substantially raising the cost per hectare of new irrigation projects, which governments can no longer afford to subsidize as world agricultural prices have fallen” (McCully 2001).

At the beginning of the 20th century, India had 30,000 varieties of rice, while today 75% of the yield comes from just ten varieties (Madeley, 2002)

Green Revolution, Philippines

“Since the 1980s the yields of ‘Green Revolution’ rice on managed test plots at the Philippines International Rice Research Institute (IRRI) have been falling from 10 tons/ha in 1966 to less than 7 tons/ha in the late 1990s. The IRRI researchers believe decline attributable to degradation of paddy soils due to the switch from seasonally flooded rice to perennial irrigation with 2-3 crops/year. Year-round flooding may be killing essential soil microbes, reducing the ability of the soils to provide nutrients to the crops. Replacement of traditional manures with modern fertilizers may also be depleting essential trace elements in soil such as zinc and sulphur” (McCully, 2001).

The costly inputs of fertilizers and pesticides, along with irrigation to grow rice have “devastated the land and ruined the livelihoods of farmers”, with 48 of 54 provinces having depleted soils (Madeley, 2002). IRRI’s research depends on expensive chemical inputs, which the small-scale farmer cannot afford. They have demonstrated that adoption of integrated pest management (IPM) can help reduce the application of pesticides without affecting yields (Madeley, 2002).

Green Revolution, Zimbabwe

Two maize varieties account for 90% of the planted maize and have displaced more traditional varieties of millet and sorghum (Madeley, 2002). However, these varieties required subsidized seed, fertilizer and pesticides that ended with the adoption of structural adjustment policies (SAPs). This had an adverse impact on both production and the environment (see Chapter 12, Section 12.4.3.3, Impacts of structural adjustment on maize production and fertilizer use in Zambia and Zimbabwe).

Green Revolution, South Africa

Legum (2002) claims that a GM cottonseed sold by Monsanto in South Africa (S.A.), which incorporated the *Bacillus thuringiensis* (Bt) gene, was the first genetically modified crop grown in that country. Bt acts as a pesticide, and in 1998, over one season, Monsanto showed a 20-30% increase in yield by the best four small-scale farmers in the Makhatini district of KwaZulu Natal. The environmental NGO, Biowatch, in a 2000 analysis found (Legum, 2002):

- Pest outbreaks they had never before encountered so they still had to be sprayed over and above the cost of paying for the Bt gene. A key pest in South Africa's GM cotton, the stinkbug, was a problem in American trials, but this information was never provided to the farmers. In some cases, a high proportion of the crop was lost.
- Small-scale farmers had to sign license agreements, which they did not understand, making it illegal to store seeds or to exchange them with neighbors.

- According to the GMO act, farmers were held liable for any environmental or other damage as a result of planting the crops including genetic pollution.

According to Louw (*pers. comm.*) of Textile S.A., who is working with the 3,000 small-scale farmers who grow cotton, the latter did not realize that the “Bt Cotton” only protected against boreworms and that spraying for other pests was required. Cotton S.A. is working with small-scale farmers to expand their numbers and production, which is currently only 5% of South Africa’s cotton production, the remainder being produced by 300-400 commercial farmers, the numbers and production varying depending on the international price largely controlled by the USA (see Chapter 12, Section 12.2.4.4, Cotton subsidies and protected markets) compared to other commodities. South Africa imports about 50% of its cotton now. Nevertheless, GM crops such as corn are a key to food production in South Africa and will likely remain so.

Time will tell as to what degree the expensive “Green Revolution Technologies” will help Africa. GM technologies may prove useful if integrated into low-input low-cost technologies to lower costs of the Green Revolution.

5.12.1.3 Irrigation potential

“The soils of the ‘Green Revolution,’ which had supported traditional farming for hundreds of years, are becoming waterlogged and suffering from salinization from perennial irrigation. It is estimated that more land is being abandoned each year from soil salinization than new schemes coming on line” (McCully 2001).

In Sub-Saharan Africa in the 1980s, for every hectare brought under irrigation, another went out of production due to salinization and water logging (Madeley, 2002).

Currently, there are approximately 5.2 million ha in irrigation in Sub-Saharan Africa (Table 5.28) using only 2% of the renewable water supplies (FAO, 2002a). FAO's definition of irrigation includes traditional floodplain recession agriculture, "data on irrigation relate to areas equipped to provide water to the crops. These include areas equipped for full and partial control irrigation, spate irrigation areas, and equipped wetland or inland valley bottoms" (FAOSTAT, 2004).

Table 5.28: Actual irrigation in Africa and Sub-Saharan Africa

Irrigation	Year	1961	1971	1981	1991	2002
Agricultural Area (1000 Ha)						
Africa		7,410	8,609	9,631	11,351	12,879
Africa South of Sahara		2,709	3,171	4,064	4,883	5,225

Note: Includes islands of Madagascar, Mauritius and Sao Tome and Principe for both Africa and Sub-Saharan Africa
Source: FAOSTAT (2004)

If one discounts Madagascar with 1,090,000 ha and Sudan 1,950,000 ha in irrigation (FAOSTAT, 2004) only 2,185,000 ha was irrigated on the rest of the subcontinent in 2002.

The potential for irrigation along with "environmental constraints" is 42.5 million ha for all of Africa (FAO, 1997d) (Table 5.29) or about 30,770,000 ha¹⁰⁰ for Sub-Saharan Africa. Alemayehu (2000) estimates an irrigation potential of 33.6 million ha in Sub-Saharan Africa.

¹⁰⁰ From Table 5.29 Subtracting off Nile River, North Interior, Mediterranean Coast, North West Coast, North East Coast, Madagascar, Islands

Table 5.29: Environmental impact assessment of irrigation, by basin in Africa

Basin	Irrigation potential (1000 ha)	Environmental impact hazard				
		Salinity	Health	Forest	Fishery	Wildlife
Senegal river	420	+++	++	+	+	+
Niger river	2,817	+++	++	+	++	++
Lake Chad	1,163	+++	++	+	++	++
Nile river	8,000	+++	+	+	+	++
Rift Valley	844	+	++	+	+	+
Shebeli-Juba	351	+++	+	+	+	+
Congo/Zaire river	9,800	+	+	++	+	+
Zambezi river	3,160	++	++	+	+	+
Okavango	208	++	+	+	+	+++
Limpopo river	295	++	++	+	+	+
Orange river	390	++	+	+	+	+
South interior	54	+++	+	+	+	+
North interior	71	+++	+	+	+	+
Mediterranean Coast	850	+++	+	+	+	+
North West	1,200	+++	+	+	+	+
West Coast	5,113	+	++	+	+	+
West Central	835	+	++	++	+	+
South West Coast	1,808	++	++	+	+	++
South Atlantic Coast	84	++	+	+	+	+
Indian Ocean Coast	1,500	+	+	+	+	+
East Central Coast	1,928	+	++	+	+	+
North East Coast	78	++	+	+	+	+
Madagascar Islands	1,500	+	++	+	+	+
Total	42,504	++	+	+	+	+

Source: FAO, 1997d, with permission, UN& FAO. +++: serious, ++: moderate,
+: low or nil

FAO (1997b *In:* Barbier, 1998) estimates that 6% (11,580,000 ha) of Africa's 1995 cropland under cultivation (193 million ha) was under irrigation (Table 5.16). NEPAD (2002) estimates the percentage of arable¹⁰¹ land in Africa that is irrigated to be 7%, amounting to 12,879,000 ha in 2002 (Table 5.28). NEPAD (2002) estimates that barely 3.7% or about 5.2 million ha of arable land was under irrigation in Sub-Saharan Africa as noted by FAOSTAT (2004) (Table 5.28). Alemayehu (2000) estimates that about 5.3 million ha were under irrigation in Sub-Saharan Africa in 1982 of which 2.7 million ha were small-scale "traditional" irrigation. That would imply about nearly half being linked to "traditional floodplain recession agriculture" that is often considered as a form of irrigation and/or mini-barrage schemes for small-scale farmers, as is described in Chapter 7 on dams.

Similarly, according to McCully (2001), FAO estimates that nearly 50% of the 5 million ha irrigated in Sub-Saharan Africa receives water from small-scale and traditional systems. This implies that the 2,185,000 ha irrigated on the rest of the subcontinent in 2002, discounting Sudan and Madagascar, is mostly small-scale and traditional, likely a large part on traditional floodplain systems (recession agriculture as discussed in Chapter 7).

NEPAD (2002) provides slightly different figures for the rest of the world; the corresponding percentages are 10%, 29% and 41% of the arable land that is irrigated for South America, East and Southeast Asia and South Asia respectively compared to Table 5.16.

¹⁰¹ Arable Land "is land under temporary crops (double-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years). The abandoned land resulting from shifting cultivation is not included in this category. Data for "Arable land" are not meant to indicate the amount of land that is potentially cultivable (FAOSTAT, 2004). FAO helped put together the NEPAD report.

In Africa as a whole, in the absence of deliberate steps to accelerate progress, the amount of irrigated land is expected to grow at under 1%¹⁰² over the period from 1995/97 to 2030, at which time the amount of irrigated land would be barely 20% of the potential in Sub-Saharan Africa (NEPAD, 2002). FAO (2002a) sees a potential to increase land under irrigation by an additional 2 million ha by 2030, an annual growth rate of about 1.1% assuming irrigation climbs from the existing 5 to 7 million ha. If 7 million ha is 20% of the irrigation potential, this implies an irrigation potential of about 35 million ha for Sub-Saharan Africa, similar to the estimate of 33.6 million ha given by Alemayehu (2000). Looking towards the Year 2010, in Sub-Saharan Africa, the relative contribution of irrigated cereal production could rise from 11% of food demand and 9% of total cereal utilization to 13% of food demand and 11% of total utilization. Cereal output from irrigation in Sub-Saharan Africa has the possibility to triple from 4.6 to 15 million tons (Nana-Sinkam, 1995). However, a Stanford University study in the early 1980s (Pearson, Stryker & Humphreys, 1981 *In:* University of Michigan, 1985a) raised serious questions over the viability of existing irrigated rice schemes in West Africa, finding only Mali and Sierra Leone as having the potential to produce rice cheaper than imports.

Major environmental constraints to irrigation, which are discussed in more detail in Chapter 7 on dams, are the problems associated with irrigation requiring exorbitant costs of mitigating salinization (e.g., tile and drainage fields), as well as artificial flooding to maintain traditional floodplain ecosystems for food production and biodiversity. Also irrigation can result in both internal and cross border conflicts (see Chapter 7, Section 7.9.3.1, Senegal River and Chapter 13, Section 13.11, AFRICA'S POTENTIAL WATER WARS), where water in much

¹⁰² This is believed to be 1%/year since the NEPAD report was put together by FAO and the FAO (2002) projected increase in irrigation by an additional 2 million ha, below, amounts to a 1.1%/year increase. Use compound interest formula: Future Value = Present Value (1 + growth rate)ⁿ where growth rate expressed as %/100 and n = period in years. Can also be used to estimate population growth rates of people and wildlife,

of Africa is limiting. Its use and allocation will require careful planning especially where rivers cross many borders such as the Nile, Niger, Senegal, Gambia, Zambezi and Limpopo Rivers.

Many of Africa's riverine systems are floodplain ecosystems in which rural communities have traditionally survived from a diverse array of resources coming off these floodplains including recession agriculture, dry season forage for livestock, wildlife, fresh and estuarine fisheries, waterfowl, etc. Modern irrigation is often based upon large dams and flow regulation that have disrupted these traditional life cycles by eliminating or greatly reducing the magnitude and/or duration of flooding in favor of man-made irrigation schemes (see Chapter 7, Section 7.8.1, Dam Impacts on Floodplains & Section 7.9.1.1, Senegal River). It is not evident that the yields from these man-made schemes are more cost-effective than helping rural communities sustainably manage these traditional floodplain systems. In addition, rural communities tend to be displaced by multi-nationals and national elites (bureaucrats and small traders) in the take-over of modern irrigation systems (see Chapter 7, Section 7.9.3.1, Senegal River & Section 7.9.5.1, Senegal River). Thus, they lose their traditional systems, while lacking access to the modern systems, usually due to being under-capitalized and lacking the technological skills to sustainably manage these intensive irrigation systems (Madeley, 2002). Because of the diverse array of resources taken from Sub-Saharan Africa floodplains, in many instances the loss of these traditional resources, in place of mono-culture such as rice, can result in malnutrition (see Chapter 7, Section 7.9.8.1, Senegal River). For example,

“there is growing evidence that large-scale capital intensive water development schemes do provide neither the range of foodstuffs nor the economic return of traditional systems. Studies, comparing the efficiency per unit of water of traditional extensive systems of cultivation, grazing and fishing in the Niger Inner Delta (a traditional floodplain ecosystem) with the intensive modern project

of the Office du Niger, showed that both systems produce about the same gross profit margin,¹⁰³ even when the running costs and management charges for the irrigation scheme are taken into account. However, the extensive system produces meat, milk, fish and rice compared to the rice-only irrigated system. More importantly, when the interest charges arising from the irrigation scheme are taken into account, the net profit from the irrigated rice turns into a loss of \$US 0.65/100 m³ of water, whilst the extensive traditional methods benefit from the 'free services of nature' and turn in a net profit of US\$ 0.42/100 m³ at 1984/85 prices" (FAO, 1997d).

In theory, dams with controlled releases could provide both modern irrigation while maintaining traditional floodplain systems. Hydrologists can easily model these events, but in practice, this mitigation tends to be ignored in favor of using water for other purposes (e.g., electricity) – see Chapter 7. The net result is that very often the rural poor are actually nutritionally and economically worse off from large-scale irrigation schemes. NEPAD's (2002) goals for irrigation

"required for land and water development until 2015 into: 1) small-scale irrigation developments, including small-scale informal irrigation, humid lowland developments, as well as land improvement activities (14.2 million ha), 2) upgrading and rehabilitation of existing large-scale irrigation systems (3.6 million ha), and 3) development of new, large-scale schemes (1.9 million ha)".

As noted the major emphasis will be placed on small scale irrigation (see discussion below).

Irrigation Technologies

The current strong interest in irrigation in Africa arises from the growing incapacity of much of the continent to feed itself. Food production, predominantly

¹⁰³ (Net Profit To Company/Gross Profit) x 100

under rainfed conditions, has risen at a rate of only 1.4% per annum in the period 1970 to 1990, less than half the rate of population growth that is estimated at 3.0% per annum. Recurrent droughts have accelerated the rising trend of cereal imports, which amounted to 28 million tons in 1984 and 31 million tons in 1992 (see Table 5.4) (Nana-Sinkam, 1995).

Botswana, Burkina Faso, Kenya, Mali, Mauritania, Niger, Senegal and Somalia contain some 11% of Africa's population. Their lack of rainfed potential and/or rising demographic pressure on rainfed land, are likely to make irrigation an essential element of future food strategies in the short and medium term. Eventually, some large-scale schemes may be justified in these countries, but there is a need to take advantage first of the scope for cheap rehabilitation wherever possible and, in some cases, expand existing schemes. Simple improvements to traditional swamp and flood irrigation, although giving smaller yield gains, could in aggregate also make an appreciable contribution to food supply (Nana-Sinkam, 1995).

Another 14 countries in Sub-Saharan Africa have some of their territory in drought-risk zones where small-scale irrigation based mainly on small dams (mini-barrages), direct pumping from rivers and groundwater could do much to reduce rural hardship and the need for costly disaster relief (Nana-Sinkam, 1995).

For the remaining countries in Sub-Saharan African, first priority is more likely to be given to rainfed development, which is usually simpler to organize, cheaper and can give quicker benefits. Nevertheless, few of these countries can afford to discard any existing schemes where rehabilitation is feasible, and in most there is scope for improvement and possibly expansion of traditional and small-scale irrigation (Nana-Sinkam, 1995).

Traditional Irrigation Sub-Saharan Africa

Traditional floodplain (recession agriculture) and swamp irrigation is practiced across Africa, some of the better-known systems being the Inland Delta of Niger in Mali, along the Senegal, Gambia, Pongola (South Africa) and Zambezi (Delta of Mozambique) Rivers. The *shaduf*-type irrigation also exists around oases. Ground water is used in other traditional systems for fruit and vegetable production where ground water is close to the surface and markets are available (Moore, *et al.*, 2000). Likewise, in the highlands of Tanzania (Kjekshus, 1977) and Kenya, traditional gravity-fed irrigation systems have existed for centuries. Improving these systems may be just as important as modern high-tech irrigation in assuring increased food security in rural Africa (Madeley, 2002).

Small-Scale Versus Large-Scale Irrigation

René Dumont (1966), in his work, is a proponent of small-scale peasant controlled irrigation over large-scale inefficient state run irrigation that often favors the elite, and even did do back in the 1960s. He cites the example of large scale irrigation of the overly-bureaucratic Niger Office (*Office du Niger*), providing a small 6.5% return on investment, where 33.3% would be required to demonstrate economic viability along the Inner Niger Delta. This compares favorably to the experience of failed large-scale irrigation schemes of SAED (*Société d'Aménagement et d'Exploitation des terres du Delta du Fleuve Sénégal*) along the Senegal River (see Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture, Irrigation Along the Senegal River; Chapter 7, Section 7.9.5.1, Senegal River and Section 7.9.7.1, Senegal River and Chapter 12, Section 12.4.4.1, Impacts of structural adjustment on peasant farmers along the Senegal River for detailed discussions on development impacts on traditional agro-pastoral systems in the Senegal River

Basin). By 1961, the *Office du Niger* project was producing only 1,000 tons of the originally projected target of 300,000 tons of irrigated cotton and food. Farmers and laborers from the more productive south were recruited disrupting families and entire societies. At the same time, logging and forest clearing in Upper Guinea, the source of the Niger River, was resulting in less transpiration and less rainfall. In 1973, the Niger failed to flow. In 1984, its flow was the lowest in a century, though floods returned in 1985 (Rosenblum & Williamson, 1987). This deforestation has continued in the Guinea-Conakry Highlands, threatening the long-term flows and hydrological regimes¹⁰⁴ of not only the Niger, but Senegal and Gambia Rivers among others (see Section 5.9.3.2, Loss of fallow turning wildlife into a short-term resource, Fouta Djallon Mountains, Guinea-Conakry).

René Dumont (*In:* Rosenblum & Williamson, 1987) in his book “A Very Bad Finish” written in 1987 at age 82 suggests that the for the same money that financed the failed dams and large-scale irrigation schemes on the Senegal River (see Chapter 7), 200 small dams and hand tools could have brought 40,000 villages to life from Senegal to Chad.

As is seen in Chapter 7, dams on the Senegal were not about helping Africa to develop but about Western consulting and construction firms getting rich or as Dumont says,

“ ‘has enriched foreigners, entrenched corrupt states and alienated peasants’ ” (René Dumont *In:* Rosenblum & Williamson, 1987).

In the Gambia River Basin, mini-barrages for local irrigation were strongly considered (Chapter 7, Section 7.7.5, Politics of Proposed Dams on the Gambia

¹⁰⁴ Risk of increased flows and flooding in rainy season, and reduced flows in dry season from decreasing water retention due to vegetation removal.

River, Section 7.9.5.2, Gambia River and Section 7.11, ALTERNATIVES TO LARGE DAMS).

Major Constraints to Irrigation as an Alternative to Production

There are many lessons for Sub-Saharan Africa, as it turns to irrigation to help solve its food problems. 2003 was the International Year of Freshwater. Irrigation - made possible through a network of canals, wells, dams and reservoirs – is responsible for the production of 40% of the world's food supply. Irrigation has also boosted crop yields and opened up new lands for farming. However while, we live on a water-rich planet, fresh water is not evenly distributed. This is resulting in more and more farmers - especially in regions of the world dependent on irrigation for food - coming up dry. China, India, Pakistan and the USA are the top four irrigators in the world (VOA, 2003).

Each of those three Asian countries has serious water problems in each of its major zones of irrigated agriculture: 1) rivers running dry, 2) ground water over-pumped extensively in order to meet demands for food production, thereby disrupting the natural hydrologic cycle, causing rivers and wetlands to dry up, the ground to collapse and fish, wildlife and trees to die and 3) soils becoming salinized. Salt is building up in the soil as a result of irrigation practices in a dry climate, making the cost of irrigation very high. If irrigation is to be sustainable, it will require construction of expensive subsurface drainage systems (VOA, 2003).

The collapse of many ancient desert-based and irrigation dependent civilizations [e.g., Mesopotamia (Iraq) and the Hohokam of central Arizona] is linked to soil salinization from irrigation. Only irrigation dependent Egypt avoided such catastrophes due to the cleansing of the annual Nile floods, that is until the

construction of the Aswan dams and now it too is faced with major soil salinization problems among others (Reisner, 1986; Ward, 2002).

In Pakistan, the Indus River and its 57,960 km (36,000 mi) of canal and 89,000 local watercourses – with a length of over 1.6 million km (million mi) in total – irrigate over 14.2 million ha (35 million acres) of land. However, as early as the 1960s, it was losing 40,485 ha (100,000 acres) of farmland/year from water logging and salinization (Ward, 2002). In Senegal, the cost of mitigating these two parameters puts the cost of irrigation perimeter construction at \$25,000-40,000/ha (Bosshard, 1999) (see Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture, Irrigation Along the Senegal River; Chapter 7, Section 7.9.6.1, Senegal River and Chapter 12, Section 12.4.4.1, Impacts of structural adjustment on peasant farmers along the Senegal River). It is estimated that about one out of every five ha of irrigated land worldwide is suffering in some degree from the build-up of salt in the soil. Thus, the challenge of better soil and water management is to try and reduce this problem and keep that land productive (VOA, 2003).

“This generation of farmers is also the first to face widespread aquifer depletion due in part to the use of powerful diesel and electric pumps that have become widely available only in the last few decades. Prospects for the big-three grain producers—China, India, and the United States, which account for nearly half of the world's grain harvest—show the potential consequences of future water shortages...Under the North China Plain, which produces half of China's wheat and a third of its corn, water tables are falling up to 3 meters per year. A World Bank assessment of China's water situation says, ‘Anecdotal evidence suggests that deep wells [drilled] around Beijing now have to reach 1,000 meters [more than half a mile] to tap fresh water, adding dramatically to the cost of supply’...In unusually strong language for a Bank report, it foresees ‘catastrophic consequences for future generations’ unless water use and supply can quickly be brought back into balance. In India, water tables are falling throughout most of the country. As a

result, thousands of wells are going dry each year" (Brown, 2003b).

In the United States, the USDA reports that in parts of Texas, Oklahoma, and Kansas—three leading grain-producing states—the underground water table has dropped by more than 30 meters (100 feet). As a result, wells have gone dry on thousands of farms in the southern Great Plains (Brown, 2003a; 2003b). The Ogallala Aquifer, which stretches from South Dakota to Texas in the USA, is being mined faster than it can be replenished. Use of these waters resulted in one of the most profound changes by humans in North America, turning short grass plains on which buffalo once roamed into a breadbasket of grain production. By 1977, waters from the Ogallala Aquifer were irrigating 4.9 million ha (12 million acres), raising 40% of America's cattle and accounting for a large percentage of agricultural exports. The supply of water from this aquifer is predicted to begin playing out sometime around 2020, slowly shutting down irrigation from south to north. Concern exists that as high yielding irrigation plays out, marginal land taken out of production will be returned to the plow, with similar results as seen in Sub-Saharan Africa with the loss of fallow and expansion onto marginal areas: soil degradation and the potential for a second "dust bowl" (Reisner, 1986). Water supplies are even tighter in California (Brown, 2003b).

Over-pumping for irrigation is a way of satisfying the growing demand for food today that almost guarantees a future drop in food production when the aquifer is depleted. For a few countries, the day of reckoning with aquifer depletion is already here. For many others it is drawing near. Brown (2003a) believes that

"many countries are in essence creating a "food bubble economy"—one in which food production is artificially inflated by the unsustainable use of water. When a stock bubble bursts, the stocks eventually regain their value. But when a food bubble bursts, production may not regain earlier levels. With aquifer depletion, either the rate of pumping is reduced to the level of recharge, if it is a replenishable aquifer, or pumping ceases

entirely, if it is a fossil aquifer. This consequence of excessive reliance on underground water was not obvious when farmers began pumping on a large scale a few decades ago. The great advantage of pumping groundwater is that farmers can apply the water to crops precisely when it is needed, whereas surface water is released for everyone at once, whether or not that is the best time for individual farmers. Groundwater, in contrast, is also available throughout the year, including during the dry season, enabling farmers to double crop their land”.

Overcoming Institutional and Policy Constraints to Irrigation, Mali

Social, institutional and economic factors appear more important than technical limitations to irrigation.

Irrigated rice production has increased steadily in Mali since the trade liberalization of cereal markets and the rehabilitation of abandoned rice perimeters. The *Office du Niger* reports that between 1983 and 1994, the number of farmers participating in the irrigation scheme tripled, average paddy yields tripled, and per capita paddy production nearly doubled (FEWS, 1997).

There is thus a major need to have a bottom-up participatory approach with small-scale farmers in developing irrigation schemes. IFAD (2001) found a near-total lack of meaningful farmer participation in perimeter planning, crop and technology choice, organization of water and pump use and settling of land tenure disputes. An IFAD-sponsored evaluation of experience with small-scale irrigation found that participation in small-scale irrigation projects has generally been little more than rhetoric.

As discussed above and detailed in Chapter 7, large scale-irrigation makes little or no sense if it is at the expense of traditional production systems and small-scale farmers. Appropriate allocation of water should allow both production systems to

co-exist to some degree. However, controlled flooding appears to take a back seat to other priorities such as producing electricity. The failure to factor in the mitigation of traditional floodplain ecosystems should not be tolerated by the international community, who usually funds and constructs these systems. The failure to address such issues is, in the authors' opinions, a gross violation of human rights.

As available water resources come under severe stress in much of Sub-Saharan Africa, strategies must be found to optimize water use, including improved efficiency, reuse of drainage and wastewater, and coordinated use of surface and groundwater (Lake & Souare, 1997). Analysis of soils, surface and ground water, along with a monitoring program of quality and quantity, is advisable for such schemes, especially for large schemes, which may compete with the public for potable water. For irrigation to be successful in the long-term, this implies careful pre- and post-planning, and a thorough modeling of total water availability and its partitioning to meet irrigation, potable, ecological and industrial needs. With many rivers being international, this may be required at an international regional level (see: Chapter 13, Section 13.11, AFRICA'S POTENTIAL WATER WARS).

Grain for Water

"Our individual daily water requirements for drinking average 4 liters per day, while the water required to produce our food each day totals at least 2,000 liters—500 times as much. In affluent societies, where grain is consumed in the form of livestock products, water consumed as food can easily reach 4,000 liters daily" (Brown, 2003a). "Because it takes 1,000 tons of water (1,000 cubic meters) to produce 1 ton of grain, importing grain is the most efficient way to import water. Countries are now satisfying their growing demand for water by tapping international grain markets. As water shortages intensify, so too will the

competition for grain in these markets. In a sense, to trade in grain futures is to trade in water futures" (Brown, 2003a).

However, if the global grain deficit continues and/or grain is converted to ethanol or bio-diesel in favor of food, this may not be possible (Section 5.3.1, Global Food Production).

Irrigation Losing Out to Cities and Industrialization

Irrigation will also have to compete with cities and industries for available water. In the competition for limited supplies of water among agriculture, cities and industry, the economics of water use does not favor farmers, simply because it takes so much water to produce food. Worldwide, 70% of all the water diverted from rivers or pumped from underground is used for irrigation, 20% is used by industry and 10% for residential purposes (Brown, 2003a).

Water tends to generate 50 to 100 times more economic value used in industries than it does in agriculture. Therefore, as water becomes scarce from an economic sense, it usually makes sense to move that water from irrigated agriculture over to cities (VOA, 2003). While it takes 1,000 tons of water to grow a ton of wheat, it takes only 14 tons of water to make a ton of steel (Brown, 2003a).

In the long-term, can water for irrigation compete with urban demands? Brown (2003a) believes that water consuming waste removal, "sewage" may not be sustainable in the long-term, both in its wastage of water and in its adverse impacts on the aquatic environment (see Chapter 8). This would require new technologies to be developed for sewage treatment and disposal, freeing up more water for irrigation.

However, it is not that simple since 70 - 90% of people living in many developing countries are in agriculture. The question also arises of how to meet the needs of 8 billion people on the planet while at the same time protecting the aquatic ecosystems that we all depend upon, that all life depends upon. Therefore, this requires a very fundamental change in how we use, manage and value water. In 1950, there were 5,000 large dams in the world and today we have 45,000, which means that we are controlling rivers and interrupting natural cycles in a major way. We have done this in a very short period, so ecologically we do not know if it is sustainable (VOA, 2003) (see Chapter 7).

Water Conservation Measures

“Historically, farm productivity was measured in yield per hectare, since land was the constraining resource. But as the twenty-first century begins, policymakers are beginning to look at water as the limiting factor for food production. The common measure that is emerging to measure water productivity is kilograms of grain produced per ton of water.

Although there are many ways of raising irrigation water productivity, a few stand out. For those using surface water irrigation, reducing seepage from the canals used to carry water from large reservoirs to farms cuts water use. It is not unusual, particularly where distances are long, for water seepage losses to reach 20–30%. This water can be saved if canals are lined with plastic sheeting or concrete—a more costly but more long-term solution.

A second approach is to use a more efficient technology, such as overhead sprinkler systems. Commonly used with center-pivot irrigation systems, their weakness is that some water is lost to evaporation even before it hits the ground, especially in hot, arid settings. Low-pressure sprinklers, which release water at a lower level, close to the soil surface, lose less water through evaporation and drift. These are now widely used in the Texas panhandle of the United States, where aquifer depletion is encouraging farmers to use water much more efficiently” (Brown, 2003a).

The gold standard for efficiency is drip irrigation, a method that supplies water directly to the root zone of plants (Table 5.30). “Drip irrigation”, which is only used on 1% of irrigated land worldwide, increases water use efficiency by 95% compared to conventional methods. It is not practical to irrigate wheat or rice with drip irrigation, but you can irrigate cotton and sugarcane and most fruit and vegetable crops and orchard crops. With the grain crops, there have been good increases in efficiency with the use of sprinkler irrigation technologies. Even where gravity systems are in use, better (water) management techniques can improve efficiency (e.g., leveling of the fields) (VOA, 2003).

“In addition to cutting water use by up to half, drip irrigation also raises yields because it offers a constant, carefully controlled supply of water. Israel, where water shortages are acute, is the world leader in developing drip technology. It is also now widely used in other countries, including Jordan and Tunisia. In recent years, the tiniest small-scale drip-irrigation systems—the size of a bucket—have been developed to irrigate a small vegetable garden with roughly 100 plants (25 square meters)” (Brown, 2003a).

Table 5.30: Water productivity gains when shifting from conventional surface irrigation to drip irrigation

Crop	Changes In Yield (1)	Changes In Water Use (Percent)	Water Productivity Gain (2)
Bananas	52	-45	173
Cabbage	2	-60	150
Cotton	27	-53	169
Cotton	25	-60	212
Grapes	23	-48	134
Potato	46	0	46
Sugarcane	6	-60	163
Sugarcane	20	-30	70
Sugarcane	29	-47	143
Sugarcane	33	-65	280
Sweet potato	39	-60	243
Tomato	5	-27	44
Tomato	50	-39	145

(1) Results from various Indian research institutions. (2) measured as crop yield per unit of water supplied (expressed as a percentage)

Source: Brown (2003a) with permission, Earth Policy Institute.

Although dropping from US\$ 1,200–2,500/ha to US\$ 425–625/ha (Brown, 2003a), the cost of drip irrigation is still a major factor for small-scale farmers in Sub-Saharan Africa. Other actions include the following (Brown, 2003a):

- Another technique for raising water use efficiency in both flood- and furrow-irrigated fields is laser leveling of the land, a precise leveling that can reduce water use by 20% and increase crop yields by up to 30%, boosting water efficiency by half;
- Shift to more water-efficient grains, such as from rice to wheat (limited by climate over much of Sub-Saharan Africa);
- The economic efficiency of water use can also be raised by shifting to higher-value crops, a move that is often market-driven;
- Institutional shifts, specifically moving the responsibility for managing irrigation systems from government agencies to local water users' associations, can facilitate the more efficient use of water. Farmers in many countries are organizing locally so they can assume this responsibility. Since local people have an economic stake in good water management, they typically do a better job than a distant government agency;
- More and more countries are turning to local rain water harvesting to ensure adequate supply more than outweigh this additional expenditure, as opposed to environmentally and socially adverse large-scale dam schemes (e.g., mini-barrages at a local level);
- Another technique to retain rainfall is the construction of ridge terraces on hillsides to trap rainfall near where it falls, letting it soak into the soil rather than run off; and
- The water storage capacity of aquifers can also be exploited. In some ways, they are preferable to dams because water underground does not evaporate. Percolation from locally constructed water storage facilities

often helps recharge aquifers. Similarly, land that is covered with vegetation retains rainfall, reducing runoff and enabling water to percolate downward and recharge aquifers. Without vegetative cover, rainfall runs off immediately, simultaneously causing flooding and reducing aquifer recharge, thus contributing to water shortages. In effect, floods and water shortages are often opposite sides of the same coin. Reforestation, particularly in the upper reaches of a watershed, not only helps recharge aquifers but also conserves soil that if washed away might end up behind dams downstream, reducing the storage capacity of reservoirs.

5.12.1.4 Managing genetic resources of soil biota for enhanced productivity and plant health

Soil biota are responsible for decomposition; nutrient acquisition, storage and cycling; soil organic matter synthesis and mineralization; soil structural modification; regulation of atmospheric composition; and the biological control of soil borne pests and diseases. There is a major need for further research in the biological processes of soil, which lags behind research on the physical and chemical management of the soils (CIAT, 2002).

5.12.1.5 Selection of crops appropriate to the soils and ecology

René Dumont (1966) gives the southern Ivory Coast as an example, where rich forests were cleared yielding four harvests of coffee, but exhausting the soils. On the other hand, over 75 tons of palm oil could have been harvested from the same area in 25 years without leaving the land impoverished if well manured and maintained. He saw coffee plantations fail in the Central African Republic (CAR) from being located in the inappropriate climatic dry forest zone.

Many crops around the world are grown in climates that are not appropriate to those crops. Thus, a lot of water is required to grow cotton or rice in very dry climates where those crops may not be appropriate to production there. Therefore, better matching of the growth of crops with the climate in those regions could help make more efficient use of water. The use of scarce water on marginal lands may just not make sense anymore. There are parts of China, India, Pakistan and the United States – most of the major irrigators - where this may be the case (VOA, 2003).

This is where vocational training of farmers and agriculture extension are needed to advise farmers on their best crop options and on appropriate soil maintenance technologies (Dumont, 1966).

5.12.1.6 Adoption of soil conservation practices by small-scale farmers

Small-scale farmers will determine if they buy into soil conservation practices. Attempts to impose such practices and other technologies on them have tended to fail. The following points must be considered when soil conservation programs are planned (Nana-Sinkam, 1995):

- Farmers and other land users need to be involved right from the start of schemes;
- Adoption of conservation methods will depend on benefits in the form of increased or more assured yields, higher incomes or the reduced need of an input such as labor; and
- “Land tenure” is critical, as farmers will see little point in carrying out conservation work on land to which they have no assured long-term use, which depending on the system could be common property or by individual title.

Farmers and grazers are the most important part of this trio because they are in direct contact with the land and are the very people who must actually use and conserve the croplands, forests and rangelands. Any land use strategy must be farmer, grazer and forester oriented, that is from the “bottom-up”, not a “top-down” approach (GEF, 1998).

Soil Conservation Kitui, Kenya

Farmers in the Kitui area of Kenya are now terracing their fields at their own expense. The terraces very effectively prevent soil erosion, but it has been shown that in this area they also lead to yield increases in the order of 40-90%, and it is probably for this reason that they are being installed (Nana-Sinkam, 1995).

Soil Conservation Machakos Highlands, Kenya

Initial attempts at soil conservation through destocking livestock in 1938 and mechanical terracing in 1946 met with resistance. People were against forced labor two days/week under the supervision of headmen or chiefs on their land, since traditional law gave the person cultivating ownership rights to the land. The type of terracing easily collapsed in storms. This was gradually replaced by farmer-led innovations in terrace construction that has resulted in a four-fold increase in agricultural production per head in the over-populated Machakos District (Tiffen, Mortimore & Gichuki, 1994; Tiffen & Mortimore, 1994 both *In:* Moorehead & Wolmer, 2001 *In:* Devereux & Maxwell, 2001a; Carswell, 2003 *In:* Beinart & McGregor, 2003). René Dumont (1966) attributes this success, which took place during the Mau Mau uprisings, to Kamba leadership learning to help itself and thus adopting these innovative practices, transforming what had been “stark red beacons of eroded hills” into “wooded, terraced slopes, dotted with trim, white-washed homes”. Carswell (2003 *In:* Beinart & McGregor, 2003)

places improved access to markets in the late 1950s as a major reason for adopting soil conservation practices that would increase yields and thus income. She explains how the introduction of the cash crop of coffee in Nyeri, Kenya around 1950 also made terracing acceptable to the local people. Nana-Sinkam (1995) places title deeding of land as a major incentive for adopting terracing in Machakos.

In other cases, traditional terracing existed and thus European ideas were readily adapted such as in southwestern Uganda, (see Section, 5.6.1.8 Impacts of colonialism on traditional agriculture in Uganda).

5.12.1.7 Adoption of appropriate mechanization technologies

Many people may be surprised, but over much of Africa in 2003, agriculture is still undertaken by hand with a hoe. The next step up in intermediate technology is the animal drawn plow followed by full mechanization with the tractor.

“Draught animals (mainly work oxen) are a significant or predominant source of power in countries where incomes are higher and is associated with an increase in intensity of cultivation on both rainfed and irrigated land, and an increase in the area under irrigation (but no expansion of rainfed land). It appears that use of animals does not displace labor. At the other extreme, tractor-based cultivation systems are generally characterized by high GDP per capita (more than \$3000 per head) and where less than half of the economically active population works in agriculture; there are relatively larger areas cultivated per person (1 to 2 ha of harvested area). In Sub-Saharan Africa at present hand power is dominant particularly in Central Africa and Western Africa where it accounts for 85% and 70% of harvested area respectively. In Western and Eastern Africa there is significant use of draught animals despite humans remaining the major power source; there is increasing use of tractors in Southern Africa” (NEPAD, 2002).

René Dumont (1966) refers to the case study of the failed colonial ground-nut scheme in the then Tanganyika [see Section, 5.6.1.9, Failure of colonial groundnut scheme in Tanganyika (Tanzania)] and a similar failure of a groundnut scheme in the Casamance of Senegal. The scraping and hauling involved in felling trees and too deep ploughing brought barren soil to the surface requiring vast quantities of fertilizer, resulted in accelerated soil erosion and, with the irregular rains, either hardened the ground and/or rotted the seeds. He gives other examples of mechanized agriculture destroying the fragile top soils on tobacco plantations in the northern Republic of Congo (Brazzaville), and on rice plantations in the Niger Valley (Guinea-Conakry, Mali and Niger), on the Logone River of Chad/Cameroon and in Madagascar. He was a believer in animal drawn ploughs, which have minimal operation and maintenance problems and in many cases are more cost-effective. Likewise, Rosenblum and Williamson (1987) explain how soil previously turned over but protected by traditional short-bladed hoes was carried away by the wind when tractors introduced by the West tore up the fragile surface. The pros and cons of animal traction versus tractors would need to be investigated on a case by case basis.

The principal author's experience in the SAED project, Senegal would tend to confirm René Dumont's concerns. In the 1980s, graveyards of tractors were seen scattered about the SAED irrigation scheme, a few operating, while skeletons provided spare parts. Part of this is also due to what René Dumont (1966) calls the unhealthy economic mentality of Africa resulting from foreign aid, 'This money didn't cost us anything, who cares if it doesn't bring in much', and when the vehicle or tractor breaks down from lack of maintenance, the donors will buy us more. There is also often a maintenance problem associated with tractors of many makes, each supplied from the respective donor's country without adequate spare part supplies. It also demonstrates the inefficiency and continual failure of state parastatals throughout Sub-Saharan Africa.

With proper vocational training in operation and maintenance and careful evaluation of how to best till the soil, tractors may eventually become useful as traditional agriculture becomes operational on a commercial scale, while draught animals and plows fulfill the intermediate stage in agriculture, which can result in a significant increase in production if other constraints are taken into account.

Decreased rural labor from increasing urban migration of the young and HIV/AIDs (e.g., by 2020 projected loss of agricultural labor of 20% in East and Southern Africa) may make the adoption of draught animals a prerequisite to maintaining and/or increasing agricultural production (NEPAD, 2002).

5.12.1.8 Infrastructure technology as an incentive to increased agricultural production

The Commission for Africa (2005) estimates that 50% of Africa's produce is lost due to poor storage facilities and transport to facilitate access to markets. An investment in infrastructure of US\$ 30-50 million over a ten-year period could save US\$ 480 million each year for maize alone.

Highways, railroads, trucking operations, modern grain storage, access to affordable electricity, etc. must be considered key to helping farmers reduce costs, maximize profits and minimize losses of their produce between harvest and sale to consumers. For example although Africa has 13% of the world's population it consumes only 3% of global commercial energy and by 1991 fewer than 22% of African households were connected to (electrical) networks (NEPAD, 2002). Likewise, Africa lags behind the rest of the world in road infrastructure (Table 5.31).

Table 5.31: Road infrastructure in Africa compared to other developing regions

Region	Total Roads 1,000' km	Paved Roads	Unpaved Roads	% Paved
Africa	2,750	572	2,178	27
North Africa	274	177	97	65
Sub-Saharan Africa	1,817	284	1,533	16
Developing Countries	14,256	4,806	9,450	34
Latin America and the Caribbean	3,235	534	2,701	17
East Asia	2,118	703	1,414	33
South Asia	3,858	1,700	2,158	44

Source: NEPAD (2002) with permission, NEPAD.

“Only 21% of this region’s population live within 100 km of the coast or of a navigable river, against 89% in high-income countries. The proportion of the population that is landlocked is seven times higher than in rich countries. Landlocked countries in Africa have average freight costs almost three times higher than in high-income countries” (FAO, 2002a).

“A fifth (20%) of Africa’s population is landlocked - less than a third (33%) of Africans live within 100 km of the sea compared to over 40% for other developing regions...recent studies in Burkina Faso, Uganda and Zambia have shown that walking is the principal means of transport for 87% of rural households...Local road densities in a sample of representative countries in Sub-Saharan Africa show a mean density of 0.86 km/1,000 head of population, while the equivalent density in Tunisia is 2.6 km/1,000 persons, and in South Asia is some 1.8 km/1,000 persons; for middle-income countries, the density is 8.5 km/1,000 persons. Africa has the lowest density of paved roads of any of the world’s regions, which hinders access to markets” (NEPAD, 2002).

About 33% of Africa (15 of 47 countries) is landlocked, and the only river navigable from the ocean to long distances inland is the Nile (Diamond, 2005b).

“The region’s largely landlocked geography, low population density, large rural population and low share of people living near the coast or an ocean-navigable river, make infrastructure provision costly, particularly transport, communications and electricity...Africa’s transport costs – local, national, or international – are today around twice as high as those for a typical Asian country” (Commission for Africa, 2005).

Maintenance of paved roads is among the most expensive part of a country’s budget. More than 80% of unpaved roads in Sub-Saharan Africa are only in fair condition, and 85% of rural feeder roads are in poor condition, with accessibility limited in most cases to the dry season. About 33% of the roads built in Sub-Saharan Africa in the past 20 years have eroded from lack of maintenance (World Bank, 2000). Paved roads, which a country cannot maintain, are more treacherous and slow than well maintained gravel/dirt roads. In much of Sub-Saharan Africa, unpaved roads graded at least at the end of each rainy season may be the most cost-effective means of developing a viable transport network, until the wealth of the continent increases and the means exists to maintain paved highways. In planning a road network to facilitate the marketing of agricultural produce, the pros and cons of paved versus unpaved highways must be carefully considered based upon the physical environment where the road is to be built (e.g., high versus low rainfall areas, geological structure/erodability), the type and amount of traffic, and the ability of the country to afford the construction and recurrent maintenance costs. South Africa’s creation of a network of toll roads along major routes as a means of maintaining paved highways should be strongly considered by the rest of the continent.

Africa’s rail freight is under 2% of the world total, the marine freight capacity is 11% (much being foreign owned but registered for convenience in Africa) and air freight is less than 1% of the global total (NEPAD, 2002).

In a number of countries, the share of transport cost in value of trade is staggering: for example, transport and insurance payments as a percentage of the value of exports are: Malawi (55.5%), Chad (51.8%), Rwanda (48.4%), Mali (35.6%), Uganda (35.5%) and the CAR (32.8%). These costs are damaging for agricultural trade where primary products are often of low value and great bulk (NEPAD, 2002). This may also be a good argument for transformation/beneficiation in Africa prior to export as a means of reducing these costs! Mellor (1990a *In: Eicher & Staatz, 1990*) believes that foreign assistance in training and infrastructure are critical to the development of African agriculture, along with stabilization of export earnings.

NEPAD's (2002) plans for improved infrastructure include rail transport, improved road networks, telecommunications, power, ports, shipping and transit facilities, crop storage facilities, livestock watering points, fishery landings, marketing and processing facilities, harnessing modern information and communications technology, and encouraging private sector participation in infrastructure financing and operation.

5.12.2 Lost Grains of Africa

Little or no interest has been shown in developing GM food crops for poor developing world farmers (Diamond, 2005a). A National Academy of Sciences (NAS) (1996) publication on the “Lost Crops of Africa” estimates that there are 100 indigenous grasses/grains known to certain Africans but “lost” in the sense that they are being neglected in the fight against hunger. These under-exploited food plants open a new window on ways to help Africa overcome the looming crisis. These plants have much to offer, and not just to Africa. Indeed, they represent an exceptional cluster of cereal biodiversity with particular promise for

solving some of the greatest food-production problems that will arise in the 21st century. Africa's native grains tend to tolerate extremes (Vietmeyer, 1996):

- Pearl Millet (*Pennisetum glaucum*) - a 4,000 year old grain that tolerates heat and drought better than other major cereals;
- Fonio (*Digitaria exilis*) - a West African grain that is gaining popularity, but typically grown on small farms for home consumption. The plant does well in poor, sandy and lateritic soils;
- African Rice (*Oryza glaberrima*) - the native variety of this grain matures very quickly for multiple plantings;
- Sorghum (*Sorghum bicolor*) – a grain that has been spreading from Africa to become a staple of more than 500 million people in 30 nations. As such, it is still relatively underdeveloped. Sorghum thrives on marginal sites where other grains fail; and
- Tef (*Eragrostis tef*) – adapted to cold, a staple of Ethiopia is ground into flour and used to make flat, fermented bread called *injera* that sustains millions.

For thousands of years, these traditional cereals have yielded grain even where land preparation was minimal and management poor. They combine well with other crops in mixed stands. Some types mature rapidly. They tend to be nutritious. The grains of Africa retain much of the hardy, tolerant self-reliance of their wild savanna ancestors. For the future, such resilient crops will be vital for extending cereal production onto the ever-more marginal lands that will have to be pressed into service to feed the growing population. Moreover, if global warming occurs, they could even become vital for keeping today's best arable lands in production. Research is needed into improving characteristics and yields from these indigenous grains.

5.12.3 Decentralization

“In the Sahel there is general recognition in the region that central governments are poorly placed to make many decisions appropriate for local levels. Particularly in areas of agriculture and natural resource management (NRM), local populations are being asked to take leadership in deciding appropriate land uses and ownership/usufruct of resources. Decentralization laws (i.e., devolving decision-making authority over local matters, particularly land use and natural resource allocation) such as those in Senegal, Niger, Mali, Burkina Faso, and The Gambia are attempts to facilitate the needed restructuring and empowering of local populations. The reality of decentralization so far is that local decision-makers have very little discretion in decision-making, and few skills for effective implementation and monitoring of decisions taken. The institutions which have been set up to govern natural resources at the local level rarely have budgetary discretion, perceived local legitimacy, and a mandate for more than awareness-building. This is particularly the case where local governmental units have been newly created or empowered by decentralization laws. As a result, the current policy of decentralization across West Africa has become largely a matter of deconcentration (i.e., strengthening the national government at the local level) of state power” (Moore, *et al.*, 2000).

The real issue is land and resource tenure and the right to control harvest and economically benefit as a means of achieving full devolution (see Section 5.7.1, Property Rights and Land Tenure, Constraints to Soil Fertility and Agricultural Production and Chapter 9, COMMUNITY BASED NATURAL RESOURCES MANAGEMENT (CBNRM) PROGRAMS - THE WAY FORWARD? for further discussion).

Gestion Des Terroirs (GT), Decentralization West Africa

“To alleviate effects of periodic drought and promote development, different types of strategies have been implemented to assist agro-pastoral groups. Most recent among these have been participatory approaches that coincide with the growing trends of

democratization and decentralization. Previous interventions, although systematic, have largely failed to increase agricultural or livestock production and have even resulted in higher rates of depletion of natural resources. The reason for such poor results is generally perceived as stemming from the weak involvement of the local population in the conception, design, implementation and evaluation of these interventions that were consequently seen as being imposed on the local communities” (Moore, *et al.*, 2000).

GT is a multi-sector and global strategy aiming to establish new socio-economic and ecological equilibrium in order to achieve food self-sufficiency and to preserve/regenerate the productive potential of natural resources.

“The GT approach centers on organizing local (village(s) or *terroir/territory*) management committees and, from this base, begins the consensus-building process toward village-level management of natural resources...Despite the promise of these forms of local management for the future of Natural Resources Management (NRM), they still need considerable support in the form of literacy and budgetary training and although diversity of committee membership is urged, the tendency is for local elites to dominate and for women and pastoralists to be excluded (Bohrer & Hobbs, 1996 *In:* Moore, *et al.*, 2000). The GT’s greatest strength is also its greatest shortcoming. Because it is village-based, it is close to the people and can potentially be very participatory. However, because it is village-based, the committees are far removed structurally from the lowest governmental administrative level (typically composed of tens of villages) that has the decentralized mandate and potential resources appropriate to effectively manage natural resources” (Moore, *et al.*, 2000) (see Chapter 6, Section 6.1.5.2, Decentralization and creation of pastoral associations in West Africa and Chapter 9, Section 9.8.9, Gestion Des Terroirs, West Africa for further discussion).

Decentralization of Land Tenure by Government of Mauritania

“In Mauritania, a land tenure law adopted in 1983 had the stated objective of providing security to farmers by facilitating access to private land ownership. The law required the transfer of traditional property and use rights to the state, as a first step of a lengthy and

complicated process. It also required local communities to organize themselves as cooperatives in order to maintain their communal rights to the land. The law was used in some irrigated perimeters in the Senegal River Valley but practically never by peasant communities and traditional landowners in other areas. In reality, it presented a serious obstacle to irrigation development and community involvement in land improvement. It also tended to make land tenure arrangements exploitative and insecure" (IFAD, 2001).

Often, political elites expropriated land from peasants (see Chapter 7, Case study of Dams on the Senegal River).

"Under the Maghama Improved Flood Recession Farming Project, the possibility of substantially increasing flood recession farm land (from less than 4,000 ha to more than 9,000 ha) in an area dominated by traditional land-use arrangements presented IFAD with an opportunity for proposing a change of policy to the Government, involving devolution of local land tenure arrangements to the village populations concerned. A decree was promulgated in 2000 providing for beneficiary involvement in the resolution of land tenure issues. An overall framework agreement and individual arrangements guarantee secure access for at least 15 years to land upon which improvements are made. Community organizations play a central role in establishing and enforcing land tenure arrangements. Because inter-village cooperation is crucial, a cooperative grouping of all village organizations in the project zone has been created to manage the flood recession scheme" (IFAD, 2001).

5.12.4 Education, Research and Extension, Corner Stones for Development of a Land Ethic

Africa's scientific and institutional gaps should come as no surprise because of colonial under-investment in training (Eicher, 1990 *In:* Eicher & Staatz, 1990).

While donors and governments have invested heavily in African research and extension systems, these institutions have been ineffective in developing and extending technologies that respond to farmers' needs. National agricultural research and extension agencies have steadily deteriorated over time (see Chapter 12 Section 12.4.5, Decline in Research and Extension as a Result of Structural Adjustment), lacking both government and donor support, along with little incentive for qualified local researchers to develop their skills. However, in the long run preferably food security or

"food self-sufficiency in Africa will to a large extent depend upon agricultural research and development and the effective transfer of results to the farmer through extension services" (Alemayehu, 2000).

Since the 1970s and early 1980s, because of poor results from integrated rural development projects and farming systems approaches, donor interest in agricultural research and extension in Africa has declined (IFAD, 2001). The question that must be asked is how to overcome these hurdles. This will require better training of farmers (e.g., more farmers with secondary and tertiary education), and better training and motivation of extension agents who work with farmers, along with addressing land/resource tenure.

International research centers come under two major umbrella organizations: 1) the Washington based Consultative Group for International Agricultural Research (CGIAR) in Anglophone countries with 16 centers – 13 in developing countries, and 2) Center of International Cooperation In Agricultural Research & Development/*Centre de Cooperation Internationale En Recherche Agronomique et Developpement* (CIRAD) in the French speaking countries. A major criticism is that they have tended to go for Green Revolution technologies in favor of pulses (e.g., peas) and coarser grains. Successes from these research institutions include (Madeley, 2002) the:

- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) conducting research to improve yields of often neglected “orphan” crops such as pigeon pea, groundnuts and pearl millet; and the
- International Institute of Tropical Agriculture (IITA), International Centre For Tropical Agriculture/*Centro International de Agricultura Tropical* (CIAT) and the International Centre for Agricultural Research in Dry Areas (ICARDA) are developing technologies for small-scale farmers that do not require chemical inputs.

Sub-regional organizations for Strengthening Agricultural Research (SROs); the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), *Le Conseil Ouest et Centre Africaine pour la Recherché et le Développement Agricoles*/West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the Southern Africa Centre for Cooperation in Agricultural Research and Training (SACCAR) jointly established the regional Forum for Agricultural Research in Africa (FARA). The establishment of FARA completed the chain linking African agricultural scientists to the Global Forum for Agricultural Research (GFAR) (NEPAD, 2002).

There is a need to focus more on Low-External Input (LEI) agricultural research to meet the needs of small-scale farmers (Madeley, 2002) to overcome the serious problems of mining soils in many parts of Africa. These steps include 1) widespread soil testing, 2) closer cooperation and coordination between farmers and researchers to exchange information and disseminate technologies that take into account immediate farmer survival needs along with longer-term soil fertility and agricultural sustainability requirements, 3) encouragement of extension services and NGOs to pay attention to soil-related issues, 4) promotion of more

productive use of organic nutrients and 5) promotion of vegetative-cover methods to conserve soil moisture and nutrients (Gruhn, *et al.*, 2000).

Agronomic research has contributed to impressive increases in maize yields in parts of Mali, Senegal, and Burkina Faso in the last 15 years by breeding short-cycle varieties that are more resistant to drought. When Malian farmers have applied fertilizer to the new varieties, they have enjoyed a near tripling in maize yields, and they have responded by planting ten times more land to maize.

Improved millet cultivars are being adopted in the Groundnut Basin of Senegal, and improved cotton cultivars, used in conjunction with chemical fertilizers and pesticides, are contributing to yield gains in Burkina and Mali. In the latter case, animal traction has helped farmers to increase yields further by enabling them to cultivate the heavier, often richer, soils and by relieving labor bottlenecks at key points during the growing season. Small dikes constructed in the depressions (*polders*) between dunes alongside Lake Chad and in seasonal riverbeds (*wadis*) have provided enough moisture to double wheat yields. These success stories are all similar in that each depends on a minimal level of soil moisture (FEWS, 1997).

Farmers need to know how to combine organic fertilizers with chemical fertilizers, apply improved pest and weed management techniques, and adopt high yielding crop varieties (Kumwenda *et al.*, 1996 *In:* Gruhn, *et al.*, 2000). Insufficient attention to effective crop nutrition and soil fertility management studies has also made it difficult to improve yields in Africa, even when improved germ plasm has been made available. More research, expanded extension, and greater integration of knowledge could provide farmers with a stronger incentive to improve yields, maintain soil fertility and sustain agriculture.

CIAT (2002) recommends a combination of short-term, degree related and on-the-job training activities, including at the university level.

Though Africa will still need to formally train technicians in environment related disciplines, the key element for success is going to be working with farmers and/or other natural resource users (e.g., fishermen, traditional hunters, herders, charcoal makers, pit sawyers, etc. to put into place sustainable natural resource practices. Since the farmer manages the land, he/she will ask specific, environmental questions and the expert or technician will try to answer them. Knowledge that has not incorporated local information and wisdom cannot possibly provide appropriate answers for such questions (Nana-Sinkam, 1995; CIAT, 2002). Thus, the blending/integration of modern essentially “Western intensive resource management systems” with “traditional/indigenous knowledge of extensive resource management systems” along with traditional values and cultural beliefs will be necessary if research and extension is to be successful in Sub-Saharan Africa. Too often, the importance of this process is ignored! NEPAD (2002) has indicated that

“to avert food insecurity and reduce poverty, African leaders have set a target to increase agricultural output by 6% a year for the next 20 years. At present, many countries barely achieve 1% annual growth in output and some are regressing. Without technological upgrading and adoption, even large-scale investment would soon perform sub-optimally and fail to gain for Africa the success it needs.

Achieving a 3% annual growth rate will require: (a) acceleration of adoption for the most promising available technologies so as to support immediate improvement of African production by way of linking, more efficiently, research and extension systems to producers; (b) technology delivery systems that quickly bring innovations to farmers and agribusinesses so making increased adoption possible, notably through an appropriate use of new information and communication technologies; (c) renewing the

ability of agricultural research systems to efficiently and effectively generate and adapt to Africa new knowledge and technologies, including biotechnology, needed to increase output and productivity while conserving the environment; and (d) mechanisms that reduce the costs and risks of adopting new technologies. To do this requires several lines of action, of which the following may be highlighted:

- Increasing investment in research and technology development;
- Increasing the share of private sector funding of agricultural research;
- Institutional and financial reforms aimed at making national agricultural research systems more sustainable.

The proposed NEPAD research program would be comprised of four sub themes which would collectively contribute to testing the central hypothesis: 'that conservation and efficiency of use of soil and other natural resources will be optimized under conditions of market and/or policy and institution driven productivity.' The four research themes are:

- Integrated Natural Resource Management;
- Adaptive management of appropriate germ plasm;
- Development of sustainable market chains;
- Policies for sustainable agriculture.

In addition, there is to be a crosscutting initiative:

- Scientific capacity building.

Underlying the inclusion of the chapter on research is the key message that in pursuing immediate responses to its agricultural crisis, Africa cannot afford to be short-sighted: it must keep an eye on factors essential for its continuing long-term competitiveness and productivity".

A major problem for the long-term sustainability of agricultural research is getting off the donor dole and obtaining political support from other stakeholders.

"Both research and extension services in Africa depend heavily on donor funding. Contributions from donors now provide more than

40% of all funds for agricultural research. This is up from 28% in 1986 and exceeds the level of any other region. Given the fragile economies and extensive demands on the public sector in many African countries, donor support for research and extension will continue to be important for some time to come. However, African research and extension managers must start building political support for their programs among farmers, private firms, and other beneficiaries of more productive agricultural systems. They must start diversifying their sources of funds through producer levies, contract research, joint ventures with the private firms, and the like. Finally, they must open the research and extension systems to more providers, strengthening links between universities, non-governmental organizations, private firms, and others nationally and regionally" (NEPAD, 2002).

Cassava Mealy Bugs, Green Mites and Their Control, a Success Story in Research and Extension

"Introduced into Central Africa by Portuguese traders in the 16th century, cassava has established itself in much of West and Central Africa (WCA) as an important staple crop. However, while highly adaptable and robust in many different settings, cassava has been periodically plagued with devastating diseases. The cassava green mite surfaced on imported farm machinery coming into Uganda in 1971, while the cassava mealy bug emerged first in D.R. Congo in 1973, accidentally imported from its native South America. In the absence of their natural predators, both spread rapidly across the continent. The mealy bug, the more voracious of the two, caused crop losses of 80% as it ate its way across the continent at over 300 km per year. By the early 1980s, it had infested the entire African cassava belt, threatening the principal food source of over 200 million Africans" (IFAD, 2001).

"In 1981, after a year of intensive exploration, researchers at the International Centre for Tropical Agriculture (CIAT) and the Commonwealth Agricultural Bureau's International Institute of Biological Control identified a natural predator of the mealy bug in South America, a parasitic wasp. IITA (International Institute For Tropical Agriculture), with strong funding primarily from IFAD (International Fund For Agricultural Development) and other donors, rapidly mounted a mass rearing and distribution program

in collaboration with African National Agricultural Research Systems. First released in 1981, the predator wasp had, by 1988, largely controlled the mealy bug threat throughout Africa. Conservative estimates place the value of production saved at over US\$ 2.2 billion against a program cost of US\$ 15 million, generating a spectacular benefit cost ratio of 149. Spurred on by the success, researchers at IITA and CIAT redoubled their efforts to find biological solution for the lingering, but deadly, cassava green mite. Though work preceded more slowly than with the mealy bug, researchers eventually identified a suitable predator mite, which they released in a dozen sites across the continent beginning in 1993. A ferocious predator, it reduces the cassava green mite to a dried up shell in minutes. Widely credited with preserving the cassava crop in 20 African countries, in 1997, the Washington Post dubbed the predator mite ‘the bug that saved Africa’ ” (Gabre-Madhin & Haggblade, 2001 *In: IFAD, 2001*).

Buy-In to Special Program for Food Security (SPFS)

“SPFS was launched in 1994 by FAO as a means of achieving and sustaining a higher level of household and national food security. By 1992, the SPFS is operational in 68 countries of which 38 are in Africa: it has been formulated or is under formulation in another 16 countries, of which 6 are in Africa. The SPFS is implemented in a stepwise fashion, starting with pilot activities initially at a few locations (Phase I) which are progressively scaled up with the aim of gaining pilot experience in all major agro-ecological zones in a country...self-selected groups of small-scale farmers at a limited number of sites. As experience is gained and good practices are developed they are then replicated over an increasing number of sites. Depending on locally identified needs and opportunities, this first phase generally consists of four complementary components which touch on most aspects of agricultural development, viz.:

- Water and soil management: measures to address moisture limitations and excesses through low-cost irrigation, water harvesting and drainage methods, and through land husbandry systems which improve soil physical, chemical and biological conditions and avoid soil erosion.
- Raising productivity: actions to raise land or labor productivity on a sustainable basis, including improved varieties adapted to local conditions, integrated plant nutrients and pest management systems

(with a minimum dependence on purchased inputs), and improved post-harvest technologies.

- Farm diversification: measures to improve household nutrition and income and to protect against risk, initially focused on short-cycle livestock such as chickens, sheep, goats, rabbits, bees etc., with an emphasis on enabling farmers to prevent diseases and improve animal nutrition: where appropriate, support is also given to artisanal fisheries and aquaculture.
- Participatory study of socio-economic constraints that restrict farm-level profitability and food security, prevent the emergence of greater social equity and impede the implementation of the program on a wider scale.

...The implementation of pilot activities increasingly benefits from the South-South Co-operation initiative (SSC), launched in 1996 to allow recipient developing countries to benefit from the relevant experience of more advanced developing countries. To date countries in Africa have signed 22 of the 26 SSC agreements linking countries in Africa, Asia, and Latin America and the Caribbean" (NEPAD, 2002).

5.12.5 Access to Credit

As discussed throughout this chapter, access to credit can be a major limiting factor in allowing the small-scale farmer to purchase the needed inputs and machinery to increase his/her production.

However, very often it is only a few better-off farmers who are able to take the risk of taking out loans, leaving many of the rural poor in a status quo situation. A UN International Fund for Agricultural Development (IFAD) credit scheme in North Western Province, Zambia to purchase hybrid maize seeds and fertilizers went to only 9,000 out of 160,000 farming families. Most subsistence farmers grew cassava, millet and beans with some maize and were unwilling to take the risk of borrowing. Of those that did borrow, loan recoveries were 46% in 1992, 80% in 1993/4 and only 10% in 1994/5. The low loan recoveries were believed to

be due to a combination of the technologies being unsuitable and/or the farmers lacking the technical skills to take advantage of the technologies (Madeley, 2002).

Thus, credit must be linked to better training of future farmers, research and extension, if it is to be of any real value.

5.12.6 Public/Private Sector Cooperation

“As recently as a decade ago, governments in the Region saw themselves as the prime motors of economic development, today there is increasing recognition by the governments themselves that their direct role in economic activities is a more limited, though at the same time more strategically important in creating conditions for growth. It is a role which is focused particularly on the key area of establishing the policy, legal and institutional framework which enables the private sector to play the leading role in economic development, and in selectively investing in key public goods which will catalyze broad-based economic growth” (NEPAD, 2002)....

“Agricultural production services must not only effectively target smallholder producers, but must ensure that the services provided respond to the constraints they face and opportunities open to them. At the same time, there is need to strengthen the capacity of smallholder producers to define and articulate their requirements in terms of services; organize themselves to better access inputs, produce markets and production services and conduct their own agricultural experimentation; establish a strong voice for themselves in the policy and institution-building process. Supporting the development of producer groups associations is a crucial part of such an approach.

The large-scale formal private sector - particularly agri-business, is in a number of countries of the Region probably the major development partner for smallholder producers. Future progress depends on a broad-based and equitable expansion of these relations - something that will only happen on the basis of mutual interest. The commercial private sector wants to make money. It can do so - and at the same time help poor farmers make more money, if it expands its commercial relations into a realm of self-

organized smallholders who are aware of market options. More and more governments in Africa recognize the crucial role that the private sector must play, and are willing to undertake investments - in policies, institution-building as well in infrastructure - which reduce the transaction costs that the private sector faces in doing business with smallholder producers" (NEPAD, 2002).

However, "the private sector is not increasing its research efforts in Africa as government spending declines. With a share of about 2% of total spending, the private sector plays an exceptionally small role in funding agricultural research in Africa. This is not likely to change soon because the potential profits from conducting research on important crops (e.g. sorghum and millet) in Africa are not sufficiently high to attract the interest of either domestic or international private firms. In industrial countries, private enterprises fund over 50% of agricultural research" (NEPAD, 2002).

Very often, the large-scale formal sector is made up of predominantly of white commercial farmers and/or overseas multi-nationals such as Monsanto. Africans must put aside their racial prejudices and historical past and work towards the future for a prosperous Africa!

5.12.6.1 South Africa, an emerging model in public private partnerships

The South African agricultural black empowerment policy document (AgriBEE, 2004) encourages mentor programs linking white commercial farmers to traditional African farmers as a means of training them in intensive agriculture (see Section 5.7.4.2, Land reform and South Africa). The following was provided by Johan Stander (*pers. comm.*). The Department of Agriculture, Tshwane University of Technology (TUT) is collaborating in a program with the private sector. A coal mining company, XSRATA has picked three black students from TUT and will place them on a commercial "white farm" for one year. They were chosen for their "big picture" thinking skills, which are believed to indicate potential for entrepreneurialism, as farmers are businesspeople. They will each

farm 170 ha of land. Prior to this, they are receiving training in basic farm maintenance skills at a technical training college in electricity, mechanics, plumbing, welding, etc. Their work will be monitored by their “mentor” neighbor commercial “white” farmer. In addition, they will receive continued modular training in farm management, administration, personnel, etc. They will be provided with tractors and shown how to link into support services such as commercial fertilizer and seed companies. If they demonstrate potential, the mining company will help them develop a business plan and obtain a loan to set up one 700-1,000 ha commercial maize farm each. The mentor farmer will continue to provide them with backstopping for the next five years. As a means of economizing, the tractors and combines will be put into a “mechanization unit”, a company that will also have a common office in which the three farmers will be shareholders. Special emphasis will be placed on addressing administration (finances and cash flow) and marketing, which is where most small businesses fail. The mining company will guarantee surety on the loan. Variations on the theme are being implemented with small-scale farmers through the KwaZulu-Natal Agricultural Development Trust that guarantees surety on bank loans to small-scale farmers. In the case of small-scale farmers, the tribal authority determines land distribution, while a community cooperative is established as a legal entity to provide inputs and marketing, while a white commercial mentor farmer works with the small-scale farmers in technology transfer, as well as helping them link to support services (e.g., seed and fertilizer companies who supply both inputs and extension services). The cooperative is self-financing through dues, providing mechanization services (e.g., plowing, seeding, fertilizing, spraying and harvesting) and through the sale of inputs. The commercial farmer normally teams up with one black farmer with the most substantial piece of land who in essence acts as an innovator in his/her area to demonstrate best farming practices to the other small-scale farmers. The

experience has been that the best farmers tend to slowly take over the land of the technically poorer farmers.

Nevertheless, these kinds of public-private-university partnerships need to be part of a big picture plan, which identifies land for redistribution and then has a realistic as opposed to political time line over which people are trained to take over and run such operations. Handing a commercial farm to subsistence farmers risks to see the land degraded and worse - see a major decline in agricultural production. And then, who will feed the cities? Politics must be kept out of the way as much as possible other than for the general concept of land reform, allowing technicians to plan and find the way forward that assures long-term food production and thus security. There is no reason why this model cannot work for much of East and Southern Africa, where white commercial farmers are found. It may even work in Nigeria that has invited a few hundred white commercial farmers from Zimbabwe to establish commercial farms and train Nigerians in such techniques.

5.12.6.2 Private sector and traditional farmer cooperation in the sub-humid zone of Burkina Faso and Mali

“The sub-humid zone of Burkina Faso and Mali covers what has come to be known as the cotton belt of West Africa. Average annual rainfall in this zone is about 800 to 1,000 millimeters. With higher rainfall, the agricultural potential is higher compared with the Sahelo-Sudanian zone. Until recently, the agricultural potential of this area was largely unexploited because of the higher incidence of human and animal diseases, such as malaria, river blindness, and sleeping sickness. Improved public health and modest investment in infrastructure have opened up these areas and facilitated the growth of agricultural production. The predominant crops in this area are cotton, maize, sorghum, millet, cowpea and groundnut. The introduction of new cultivars of cotton and maize has been quite successful and has been combined with rapid introduction of animal traction and improved crop-

management practices, including increased fertilization, plant density, and pest control. This success story has been attributed to a combination of technological and institutional support provided, first, by a French cotton company (*Compagnie Française pour le Développement des Fibres Textiles*)...The essential elements of the strategy included supplying farmers with fertilizer on credit, and providing technical recommendations and purchase of cotton on a timely basis and at a price known before planting" (Lele, van de Walle & Gbetibouo, 1989 *In:* Williams, *et al.*, 2000 *In:* McCarthy, *et al.*, 2000).

As a result, cotton yield increased rapidly from about 200 kg/ha in the mid-1960s to about 1,300 kg/ha in the mid-1980s. These high yield levels were associated with high inorganic fertilizer and pesticide use. Average NPK fertilizer use on cotton in southwestern Burkina Faso in the mid-1980s ranged from 130 to 148 kg/ha, while it was about 190 kg/ha in southern Mali (Savadogo, 1990 ; Girdis, 1993 both *In:* Williams, *et al.*, 2000 *In:* McCarthy, *et al.*, 2000). However, inorganic fertilizer use declined with the elimination of subsidies in the late 1980s. This, together with the worldwide price collapse of cotton in 1986, led to a decline in cotton yields after 1986. However, since then—through greater use of manure and mineral fertilizer—cotton yields have picked up again" (*In:* Williams, *et al.*, 2000 *In:* McCarthy, *et al.*, 2000). Further discussions on cotton and subsidies are presented in Chapter 12, Section 12.2.4.4, Cotton subsidies and protected markets).

5.12.7 Attaining Food Security through More Appropriate Land Use Options

Rather than attempting increased, often prohibitively expensive, uneconomical and environmentally unsustainable increases in agricultural production on much of Africa's "marginal" lands where populations are expanding, there are strong options that wildlife and forestry, as land uses, with their vast array of resources and/or economic activities (e.g., safari hunting, ecotourism, bushmeat, timber,

charcoal, honey, fish, other wild foods, herbal medicines, etc.) may yield greater returns/ha than converting these areas to poorly producing agriculture. This would allow rural communities to both obtain their food as well as to purchase food and develop their area with income and commodities derived from more appropriate use of these natural systems. Chapter 9 provides details and case studies in community management of wildlife, forests and fisheries.

Wildlife as a Land Use Option on Marginal Lands

Over much of Sub-Saharan Africa, especially over vast stretches of the savanna lands that constitute about 70-75% of the land mass, wildlife and/or a wildlife/livestock mix may be a more appropriate use than agriculture.

“Marginal and unsuitable lands, identified by the assessment, should be managed to preserve their quality as they may be too uneconomical or unsustainable to support more than very low intensity traditional systems. These areas may be of benefit to other types of land use such as wetlands needed by breeding fish stocks and wildlife refuges. These marginal lands have been shown to be income producers when managed for wildlife. Kenya and Zimbabwe have been successful in attracting tourists to view wildlife in 'marginal' land set aside as wildlife refuges. Tourism (including hunting) contributes many millions of dollars to the local and national economies of both countries” (Eswaran, *et al.*, 1996).

The game industry in Southern Africa in 1999, primarily from overseas hunting, gross worth was estimated at (see Chapter 9, Section 9.5, SUCCESS OF CBNRM BASED UPON CONSUMPTION AND COMMODITY PRODUCTION):

- South Africa, US\$ 140,062,252 including 1) overseas hunters (20%): trophy fees of \$US 18,395,585 + US\$ 10 million daily rate from 29,275 hunting days, 2) taxidermy (mostly from foreign hunters) (7%): US 10 million 3) local (biltong) hunters (54%): US\$ 75 million, 4) live sales &

capture (18%): US\$ 25 million, and 5) venison market (1.1 %): US\$ 1,666,667 million, creating 63,000 jobs on 9,000 game ranches and 5,000-6,000 additional jobs as safari operators, professional hunters and staff (African Advisory Board, 2000);¹⁰⁵

- Namibia, US\$ 42 million (also includes local hunters, live sales, venison market and taxidermy) (African Advisory Board, 2000), gross US\$ 4.7-5 million from trophy hunting (TRAFFIC, 2001 *In:* Baldus & Cauldwell, 2004);
- Botswana, US\$ 12.5-20 million, trophy hunting only (African Advisory Board, 2000; BWMA, 2001; TRAFFIC, 2001 *In:* Baldus & Cauldwell, 2004);
- Zimbabwe, US\$ 21.1-22.3 million, trophy hunting only (TRAFFIC, 2001 *In:* Baldus & Cauldwell, 2004; Khumalo, 2005)¹⁰⁶ at peak before radical land reform; and
- Zambia, US\$ 12 million, trophy hunting only (African Advisory Board, 2000).

One could likely add a knock-on multiplier of from 5-7 on the overall economy from trophy hunting (e.g., transport, lodging, side eco-tourism trips, souvenirs and restaurants). Lindsey, Roulet and Romanach (2006) provide an overview of the economics and conservation value of trophy hunting in Sub-Saharan Africa, indicating little change since 1999, with the exception of South Africa with regards to gross revenues.

¹⁰⁵ Note: More recent estimates vary widely. Saayman and van der Merwe (2006) estimate that 200,000 South African biltong hunters spend a total of \$US 525,079,000 (R 3,150,474,000)/year including game/trophy fees on hunting; 76% in South Africa, 19% in Namibia, 2% in Botswana and 3% in other countries. Likewise, Lindsey, Roulet and Romanach (2006) estimate that in South Africa by 2005 overseas trophy hunting grossed US\$ 100 million/year, with clients more than doubling from 3,898 (African Advisory Board, 2000) to 8,530 (Lindsey, *et al.*, 2006), in both cases with 55-57% coming from the USA. Cloete, Taljaard & Laubscher (2007) estimate that overseas trophy hunting grossed US\$ 40 million in 2003/04 and US\$ 44 million in 2005/06 and non-consumptive trophy utilization another US\$ 22.2 million in 2004/05. Other estimates are that the overall game industry of South Africa in 2005/2006 is valued at US\$ 670,857,142 (R 4,696 million): 1) Recreational/Biltong hunting US\$ 443 million (R 3,100 million/66%), 2) Taxidermy US\$ 28.6 million (R 200 million/4%) 3) Overseas trophy hunting US\$ 72.9 million (R 510 million/11%), 4) Live animal sales US\$ 13.4 million (R 94 million/2%), 5) Meat production \$US 6 million (R 42 million/1%), and 6) Translocation US\$ 107 million (R 750 million/16%) (NAMC, 2006).

¹⁰⁶ Note estimate of US\$ 70 million for trophy hunting (African Advisory Board, 2000) believed to be too high.

“The World Travel and Tourism Council estimates that travel and tourism accounted for more than 11% of Africa’s GDP in 1999 and projects growth of more than 5% a year (in real terms) over the next 10 years, outstripping global tourism growth of 3%” (World Bank, 2000).

For instance in South Africa the

“tourism sector brings more dollars into the country than gold...In 2003, forex from tourism totaled R 53.9-billion (US\$ 8.3 billion), compared to the R 35.3-billion (US\$ 5.4 billion) from net gold exports...According to the research, tourism contributes about 7% to South Africa's gross domestic product (GDP) and adds more to domestic economic growth than the mining sector, which contributes 5% to GDP...Business tourism (including conference tourism) sustains almost 260,000 jobs in SA, and pays out R6-billion (US\$ 923 million) in salaries and R4-billion (US\$ 667 million) in taxes every year. Despite a global slump, South Africa has continued to defy world tourism trends, and in 2003 achieved a 4.2% increase in overseas arrivals (not including arrivals from Africa) compared to 2002. This in the face of a 1.3% fall-off in global travel attributed to the conflict in Iraq, fears over the Severe Acute Respiratory Syndrome (SARS) virus and a weak global economy. The country's exponential tourism growth has coincided with the its first decade of democracy: arrivals have grown tenfold since 1994, from 640,000 to 6.5-million (annual visitors) in 2003. The Standard Bank research shows that in 2003, more than half of South Africa's tourists came from other African countries - many of them on ‘shopping safaris’ - with visitors from Lesotho, Swaziland and Namibia, whose currencies are pegged to the rand, spending R7.6-billion (US\$ 1.3 billion) in the country” (South Africa Info, 2004).

Forests as a Land Use Option

“Forests including the non-wood forest products are mainly used for subsistence or low-value commerce, such as for fuel wood, (bushmeat, honey and other wild foods, medicine, charcoal). Nevertheless, forests offer many income and employment opportunities including trading in wood fuels, crafts, tourism from wildlife, etc. The uncontrolled harvesting of natural forests has

caused the destruction of biological diversity with minimal economic gains. Lack of value adding processing, and trading in forest products and services, have also reduced the contribution of forestry to economic development in the concerned countries and make forests appear dispensable. Industrial utilization of forest products has shown greatest success in plantations development, with forest-poor countries e.g., South Africa being the prime exporters of forest based products while forest-rich countries export raw logs or low-value wood” (NEPAD, 2002).

There is a need for more transformation/beneficiation of forest products in Africa, to empower rural communities to sustainably manage their forests, to assure that foreign logging companies in cahoots with national and local governments are not mining these resources, and to assure that communities are receiving their rightful share of products being harvested from the forests. Land and resource tenure are major policy issues at the heart of this problem, along with education and training of rural communities in the, value, marketing and management of these resources.

Concerning “*green label*” schemes said to assure sustainable commercial logging mostly by European companies in Sub-Saharan Africa’s tropical lowland hardwood forests (e.g., Liberia, Cameroon, Congo Brazzaville, DRC),

“nongovernmental actors and a few governments devised certification schemes for environmentally sound harvesting of lumber and pulp wood...A major limitation to certifying sustainable forest practices in the tropics is that ‘sustainable tropical forest management’ has not yet been defined in an operational sense. And some conservation organizations consider certification schemes (green label schemes) to be ‘greenwash’ because the standards are so weak and vague that any relation between compliance and true sustainability would be impossible to verify. In short, sustainable forestry remains little more than a pipe dream. Logging practices are governed far more by market forces than by long-term sustainability. Biodiversity losses continue to accelerate” (World Economic Forum, 2004) (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the

Forest People and the *Dobi Dobi*, More Parks and Protected Areas and Section 11.11.7, Case Study Bongo in the Congo (Brazzaville).

5.12.8 Moving Lower Down the Food Chain to Produce More Efficient Protein

“As both the oceanic fish catch and the production of beef on rangelands have leveled off, the world has shifted to grain-based production of animal protein to expand output. And as the demand for animal protein climbs, the mix of protein products consumed is shifting toward those that convert grain into protein most efficiently, the lower-cost products. Health concerns have also prompted some people to shift consumption from beef and pork to poultry and fish” (Brown, 2003a).

It should be noted that with the exception of South Africa and unlike Europe and America, most livestock in Sub-Saharan Africa are grass and not grain fed.

Aquaculture

“The efficiency with which various animals convert grain into protein varies widely. With cattle in feedlots, it takes roughly 7 kg of grain to produce a 1-kg gain in live weight. For pork, the figure is close to 4 km of grain/kg of weight gain, for poultry it is just over 2, and for herbivorous species of farmed fish (such as carp, tilapia, and catfish), it is less than 2. As the market shifts production to the more grain-efficient products, it raises the productivity of both land and water” (Brown, 2003a) (Table 5.32).

“The big winner in the animal protein sweepstakes has been aquaculture, largely because fish are highly efficient at converting feed into protein. Aquacultural output expanded globally from 13 million tons in 1990 to 38 million tons in 2002, growing by more than 10% a year” (Brown, 2003a) (Table 5.32). However, this should not be an excuse for not sustainably managing the world’s natural fisheries or other renewable resources” (Brown, 2003a).

Table 5.32: Annual growth in world animal protein production by source, 1990-2002			
Source	1990 (Million Tons)	2002 (Million Tons)	Annual Growth (Percent)
Aquaculture Output (1)	13	38	10.2
Poultry	41	72	4.8
Eggs	38	58	3.6
Pork	70	94	2.5
Mutton	10	12	1.5
Oceanic Fish Catch (1)	86	91	0.5
Beef	53	58	0.8

(1) Oceanic fish catch & aquaculture output figures for 2001
Source: Brown (2003a) with permission, Earth Policy Institute.

Improved Management and Marketing of Wild Fisheries as a Source of Protein

“The fishery sector in Africa is characterized by a dualistic structure with an industrial sub-sector, composed by large boats operating on a purely commercial basis targeting high quality/high value fish to serve northern markets and a high degree of vertical integration from fishing through storing and processing up to marketing in northern markets. Most value added is therefore kept by the company itself and very little left within the country, as post-harvest infrastructure, where existing, is limited to storage capacity and very little processing. On the other side is the artisanal sub-sector, composed by African fishermen engaged mainly for subsistence and the local market, using labor-intensive technology. Among the major constraints are access roads, appropriate landing facilities, and availability of adequate gear and other inputs. Future developments in the sector, aimed at promoting a locally-owned industrial fleet, and to create conditions for investments in processing infrastructure within the continent, would have to include ports suitable to the needs of the sector, strategically located with respect to the fishing areas and with the required handling facilities” (NEPAD, 2002).

“As of now, markets for artisanal fishery products are also extremely important in the African continent for both coastal communities, whose livelihood strategies are heavily dependent on fisheries, and inland populations, for which fish represents usually a cheap source of protein and nutrition compared to other sources.

Improvements to market infrastructure coupled with investments in connecting rural roads would reduce transaction costs with likely beneficial effects on both producer incomes (higher producer prices) and increased accessibility to fish and fish products for consumption by the general population (with lower consumption prices). Being built for general purposes, many African ports fail to meet the needs of artisanal fisheries, where the construction of small fishing jetties and docks could serve the many communities and villages along the African coast, thus creating poles of development that could easily link with national and regional markets” (NEPAD, 2002).

As an example, the commercial kapenta (*Limnothrissa miodon*) fisheries of Lake Kariba (potential of 8,000+ tons/year) and Cahora Bassa dam (potential of 8,000 metric tons/year) are important sources of protein for Southern Africa’s poor (see Chapter 7, Section 7.8.5, Impoundment Fisheries from Dams).

Another major problem where governments are failing on their own is in the sustainable management of Africa’s important inland and coastal artisanal fisheries. For instance

“irresponsible fishing (often as the result of dis-empowering artisanal fishermen during colonialism taking common property managed fisheries and turning them into open access unmanaged fisheries) in inland (and near shore coastal) waters results in capture levels that are often in excess of the stocking and recharge capacity. Africa gains much employment and income from lake fisheries as well as coastline artisanal fisheries on the high seas. Furthermore, the infestation of some inland lakes and waterways with aquatic weeds has reduced fish catches. The reduction of local diversity of fish populations by alien species may have serious consequences. There are severe problems with post-harvest handling, storage and distribution, which restrict supply to urban areas as well as access to overseas markets; they also keep incomes sub-optimal for fisher folk” (NEPAD, 2002).

Chapters 2, 4, 8 and 9 look closer into this issue and how fisher communities did and could be empowered to control access to and manage their resources in both coastal and nearshore inland waters. Resource and habitat/territorial tenure by fisher groups are key issues if success in this sector is to be achieved.

5.12.9 NEPAD, African Governments Overcoming Constraints to Agriculture

The New Partnership for Africa's Development (NEPAD) is a pledge by African leaders, based on a common vision, to come up with a program action to redevelop Africa (see Chapter 13, Section 13.14, NEPAD). Agriculture is to deliver broad-based economic advance through food security, income generation and diversified export growth. The first Conference of Ministers of Agriculture of the African Union, held in Maputo on 2 July 2003, examined the food security and agricultural challenges facing Africa, recommending that the “Comprehensive Africa Agriculture Development Program” (CAADP) (NEPAD, 2002) guide African governments in their agricultural development. The ministers decided to establish an African Common Market for basic food products—and to continue to address the root causes of the weakness in agriculture and the inadequacy of managing water and rural infrastructure (World Economic Forum, 2004). The CAADP was prepared by the UN Food and Agricultural Organization (FAO) in collaboration with the NEPAD Secretariat to promote interventions that best respond to the widely recognized crisis situation of African agriculture. It recommended a

“focus on investment into the following 4 mutually reinforcing ‘pillars’ that can make the earliest difference to Africa’s dire situation: (a) extending the area under sustainable land management and reliable water control systems; (b) improving rural infrastructure and trade-related capacities for improved

market access; (c) increasing food supply and reducing hunger, and (d) agricultural research and extension” (NEPAD, 2002).

The ministers also agreed to adopt fair policies and increase budgetary resources for agricultural development. The Summit of the Heads of State and Governments, also held in Maputo in July 2003, adopted a “Declaration on Agriculture and Food Security in Africa”. The Heads of State resolved to (World Economic Forum, 2004):

- Revitalize the agricultural sector through special policies and strategies targeted at small and traditional farmers in rural areas;
- Implement, as a matter of urgency, the Comprehensive Africa Agriculture Development Program (CAADP). African Union member states agreed to allocate at least 10% of national budgetary resources for implementation within five years;
- Ensure the establishment of regional food reserve systems, linked to Africa’s production, and develop policies and strategies to fight hunger and poverty; and
- Accelerate the process of establishing the African Investment Bank, which would give priority to investment in agricultural production.

The total outlay for the period 2002 to 2015 (including operations and maintenance) for the four pillars identified under the CAADP is US\$ 251 billion (all of Africa not just Sub-Saharan Africa), and is apportioned as follows (NEPAD, 2002):

- **Extending the area under sustainable land management and reliable water control systems:** Increasing the area under irrigation (new and rehabilitated), especially small-scale, from 11.6-13.5 million ha to 20

million ha and improving land management on the same area: US\$ 37 billion plus US\$ 31 billion for operation and maintenance;

- **Improving rural infrastructure and trade-related capacities for market access:** US\$ **92 billion** of which US\$ 62 billion would be for rural roads and US\$ 2.8 billion for trade-related capacities for improved market access. To protect infrastructure investments would require additional allocations for continuing operation and maintenance totaling some US\$ 37 billion over the period;
- **Increasing food supply and reducing hunger:** Raising the productivity of 15 million small farms through improved technology, services and policies: US\$ 7.5 billion. There is a “sub-pillar” on emergencies and safety nets requiring some US\$ 42 billion; and
- **Agricultural research, technology dissemination and adoption:** a total of **US\$ 4.6 billion.**

It is interesting that there is no talk of commercial agriculture. The fact is that judging from the analysis in this chapter, seeing significant increases in small-scale agriculture will be difficult due to physical and environmental constraints over much of Sub-Saharan Africa, the lack of appropriate technologies adapted to the small-scale farmer, as well as poor research and extension services. Meanwhile, the cities are swelling with young people fleeing the rural areas that have gone beyond their carrying capacities to support humanity and their livestock.

It would seem logical that a push to increase commercial agriculture in order to feed the urban masses should be a priority, but this is being ignored in favor of placing an emphasis on small-scale farmers. However, after 40 years of donor intervention in this area there are not many successes stories. Omotoso (2004) raises concerns that African governments are falling into the same old trap that

will be doomed to failure on its own. “The Accelerated Development in Sub-Saharan Africa – An Agenda For Action”, being pushed by the World Bank and apparently adopted by African heads of State fixes the development solution on the export of crops with less attention on food self-sufficiency and industrial development.

5.12.10 Industrialization, Food Security Versus Food Self-Sufficiency

USAID (2002) examined such issues in five countries; Ethiopia, Kenya, Rwanda, Mozambique, and Zambia. In each country, the bottom 25% of small-scale farm households is approaching landlessness, controlling less than 0.12 ha/capita. Even so, in none of the five countries do households in the bottomland quartile earn more than 50% of their total income, on average, from off-farm activities. The agricultural labor force is increasing faster than the area under crop cultivation and this appears to be very robust in all cases. These trends suggest that it will be increasingly difficult for farming alone to sustain the livelihoods of land-constrained households without substantial shifts in labor from agriculture to off-farm and non-farm sectors. During this process, there will be high payoffs to education, as the most highly skilled households have the best access to the well-paying non-farm jobs (USAID, 2002).

Any general and substantial increase in agricultural productivity and prosperity will depend on the development of non-agricultural sectors, the creation of jobs for the surplus rural population, and the consequent generation of expanding markets for farm products (Allan, 1965 *In:* de Vos, 1975). In Ethiopia

“officials believe that industrialization, not land reform, is the key to a better economic future for Ethiopia’s children” (Wax, 2006).

Food self-sufficiency is a peculiarly obtuse way of thinking about food security. There is no particular problem, even without self-sufficiency, in achieving nutritional security through the elimination of poverty (so that people can buy food) and through the availability of food in the world market (so that countries can import food if there is not an adequate stock at home) (Sen, 2002). This raises the debate over achieving a balance between producing food and cash crops as the best route to food security, following the principle of long-term comparative advantage rather than food self-sufficiency for its own sake (Maxwell, 2001 *In: Devereux & Maxwell, 2001a*). However, this also implies increased transformation of both food and cash crops, and other natural resources in Sub-Saharan Africa, as a spin-off, providing increased jobs through agro-industry that will also help take pressures off the lands by subsistence farmers by drawing many into the cities. By-products from agriculture such as textiles from cotton, transformed coffee and cacao, cooking oils, etc. can also become a major source of foreign exchange (Nana-Sinkam, 1995; Maxwell, 2001 *In: Devereux & Maxwell, 2001a*) taking advantage of Africa's comparative advantage in certain agricultural sectors, while importing food from other parts of the world (e.g., rice from Thailand) where it can be produced cheaper than in Africa. As French agronomist René Dumont (1966) believed, agricultural revolutions facilitate industrial revolutions.

In simple terms, if Africa's land is to continue to produce food and export commodities, the majority of the people, living beyond the carrying capacity of the land, must be pulled into urban sectors. Those people living on the land must be helped to maximize sustainable yields of their crops, while shortfalls, along the idea of Food Security, can be imported and bought with FOREX/cash generated from the transformation through African-based agro-industries. Land consolidation into economically viable units will need to occur in the many areas where subdivision has negated this possibility to date. It will be important to

identify the best agricultural land and help small-scale farmers on these lands adopt commercial technologies. Meanwhile farmers on marginal land, assuming the pressure can be taken off, and this is not yet evident, will need help in adopting improved fallow agriculture, integrating traditional and modern management systems adapted to the prevailing ecological and climatic conditions.

The transformation/beneficiation of Sub-Saharan Africa's raw products, from oil and minerals to coffee, cacao, cotton, timber, etc. in Africa can employ hundreds of thousands if not millions of people. The recent analysis by the Commission for Africa (2005) is a big proponent of the development of agro-industries on the subcontinent to fuel economic development and urbanization, South Africa being a good role model. Beyond this, Sub-Saharan Africa must be helped with telecommunications and entry into the Information Technology (IT) age, which can also help to relieve pressure on its over-used rural resources – especially its soils, pastures and wild lands. The movement into industrialization/urbanization will also be crucial not only to food security and maintenance of soil and pasture quality, but will probably also be critical in determining the future of the subcontinent's parks and game reserves, which are under tremendous pressure from the surrounding sea of poverty.

A growing number of newly industrialized and developing countries recognize that this has to be the way forward, the real issue being how fast to move and who pays. However, Sub-Saharan Africa must make sure that the worker receives an equitable share of the benefits and that adequate environmental controls are in place to protect the worker, the air, water, etc. Sustainable economic development as pursued by the South must foremost focus its efforts on meeting the developmental challenges, which are the causes of environmental degradation. In this connection, the first objective of sustainable development must be to eradicate poverty (Nana-Sinkam, 1995).

5.13 CONCLUSIONS

Often thought of as tropical, approximately 70-75% of Sub-Saharan Africa falls within the savanna biome. Over 40 years of Western donor input has failed to bring a “Green Revolution” to Sub-Saharan Africa due to major soil and climatic constraints in savanna and tropical lowland forest environments, including soil moisture (in the savanna biome), and in appropriate research.

5.13.1 Colonial and Post Independence Impacts on Agricultural Production

Although climate change (e.g., global warming) is believed to be a contributing factor, desertification is thought to be primarily man-made in origin. Although induced by rural Africans, habitat destruction and desertification can be linked to the legacy of the colonial past. This has continued into the post-independence era of the last 40 years as the result of inappropriate policies adopted by a political elite often with stronger ties to the colonial metropole than to their own people, often trained and educated in colonial policies and approaches to exploitation. This includes the following:

- The introduction of improved medical and veterinary care resulted in an explosion of humans and livestock in the 20th century. Keeping the majority of Africans backward and uneducated left them stuck in a time warp of technologies and tradition. Mono-culture cash crops for export as raw products were encouraged to stimulate the economies of the “mother country” without an understanding of the physical and chemical limitations of the soils. This took away Africans from and/or diminished traditional soil management systems such as long fallow periods, intercropping, green and animal manure, crop rotation, etc.

- Colonial powers and post-independent governments failed to recognize traditional controls over access to natural resources, management and land tenure systems. Rural communities were and continue to be disenfranchised through centralized control over land and associated resources. This resulted in the creation of “Open Access Resources” as opposed to “Common Property Resources” that could not be controlled or sustainably managed by isolated bureaucrats alienated from the rural populace, with policies that favored the needs of Europe and increasingly America.
- The inappropriate use of technologies such as the ill thought out placement of boreholes in rainy season dispersal areas, took extensive transhumance pastoralists into intensive management regimes without the concomitant training (see Chapter 6). The construction of dams ignored the downstream impacts on traditional floodplain ecosystems that provided a diverse array of resources and a more complete diet than irrigated mono-culture rice economies.
- Creating modern nation states with artificial boundaries served to inhibited mobility, especially of nomadic pastoralist, necessary to assure the sustainable use of savanna resources. Sedentarization policies exasperated this problem (see Chapter 6).
- Creating “Sherwood Forests” in the form of parks and protected areas for rich overseas tourists, today in the name of preserving biodiversity, and settler plantations cut Africans off from the diverse array of natural resources, which they obtained from these natural systems. This compressed Africans onto land that could not sustainably support them and their livestock.

Colonial powers, post colonial governments and proxy-colonial powers in the form of Western donors, International Finance Institutions (IFIs) and Western NGOs saw man-made agricultural systems (e.g., agro-forestry, crop farming, fish culture) and livestock, through failed “integrated rural development”, as the cure-all for rural Sub-Saharan Africa’s ills. Until recently, there was little regard for implicating Africans in the sustainable management of other natural resources (e.g., forests, wildlife, fisheries, minerals) that are often the best “land uses”, both economically and ecologically on what are marginal agricultural lands, especially over the vast savannas of the subcontinent. Little or no research was undertaken into improving yields of traditional African cereals such as sorghum and millet, in favor of maize that is not as well adapted to Africa’s chronically low rainfall areas that constitute the majority of Sub-Saharan Africa.

Agricultural prices were/are controlled both globally and locally to the disadvantage of the small-scale farmer providing cheap resources to the “mother country”, to corrupt marketing boards and/or to provide cheap food to the urban populace as a means of preventing civil unrest that assured/assures the *petite bourgeoisie* and their colonial masters remained/remain in power while controlling resource economies to their advantage. Structural adjustment policies (SAPs) (e.g., decreased subsidization of agricultural inputs, health and education, and declining agricultural research/extension) (see Chapter 12) and foreign aid (see Chapter 11) were/are used to keep Sub-Saharan African economies in a dependent relationship with the West. Africans remain uneducated and easily manipulated, while assuring the continued flow of cheap raw products to stimulate Western economies.

5.13.2 Net Results of Colonial and Post Independence Periods on Sub-Saharan Agriculture

Africa is in a crisis with regards to agriculture and the ability to feed itself. A human population that increased 5.5-6.5 times in the 20th century with projections, even with HIV/AIDS, of increasing another 2.4-2.8 times by 2050 to nearly 1.8 billion people has resulted in a continent that appears to have exceeded the carrying capacity to feed itself as currently managed. Along with this explosion in people, there has been a concurrent explosion in livestock (see Chapter 6 on livestock and boreholes). It is unlikely that Africa will attain food self-sufficiency alone, and thus will have to rely on a combination of food self-sufficiency and security strategies. These in turn rely on both increasing food production on the continent, as well as on alleviating poverty, in order to allow people to buy their food in a global market, as, for instance, it may be cheaper to import rice from Thailand than to produce it locally.

Within a couple of generations, there has been a major loss in knowledge of traditional soil management that had been passed on for generations.

Poorly placed and/or mismanaged boreholes resulted in massive over-grazing during the dry season in rainy season grazing areas especially along the Sahelian/Saharan borders causing desertification (see Chapter 6), while critical dry season grazing areas and recession agriculture along floodplains were wiped out from decreased downstream flooding due to dams built to support unsustainable irrigation technologies as formally practiced (see Chapter 7 on dams). In Sub-Saharan Africa in the 1980s for every hectare brought under irrigation, another went out of production due to salinization and water logging.

The exploding population and land hunger on the continent has reduced or eliminated the traditional 20-year bush fallow cycle that allowed soils to rejuvenate their productivity. This has resulted in mining the productivity of soils, which had been sustainably managed for centuries. At the same time, expanding populations moved into areas that are marginal for agriculture. Extensification of agriculture into marginal areas, often dry season grazing areas for livestock and wildlife, is putting small-scale farmers in conflict with other land users, which is resulting in both internal and international civil strife. There was massive deforestation in Sub-Saharan Africa's forested savannas as these "marginal areas" were converted into unsustainable agriculture. It is estimated that by 2010, Sub-Saharan Africa agricultural fallow periods will have disappeared in 20 countries and will constitute less than 25% of arable lands in another 29 countries.

The loss of forests has resulted in farmers using crop residue and even manure as a source of energy. In the past, crop residue provided an important source of fodder for livestock during the dry, while manure, during feeding in the fields, provided an important soil amendment to maintain soil productivity. Thus, much of Sub-Saharan Africa has been thrown into a tail spin from which it is having a difficult time escaping

In the increasingly degraded Sahelian zone, especially on the border between the Sahara Desert and the Sahel, from Senegal to northern Nigeria to Darfur, Sudan, the collision of southern moving pastoralists with northern moving farmers has contributed to major conflicts. This has resulted in massive losses of life, hundreds of thousands of Internally Displaced Persons (IDPs) and a decreasing ability of rural people to provide for themselves and/or growing urban centers. Only 4-8% of the 5.3 million km² area in the Sahel is suitable for agriculture. Similarly, the Mau Mau uprising in Kenya and more recently Maasai/Kikuyu conflicts, the Rwandan genocide, the wars in Ethiopia and the Ivory Coast and to

some degree the eastern DRC, are believed to have been/be closely linked to over-population and people trying to sustain themselves on an inadequate resource base – especially land.

Due to the extremely low value received for crops by small-scale farmers, there is an inability to afford inputs such as fertilizers or pesticides, which in some areas might have helped maintain the sustainability of the soils and increased crop yields. The reluctance of small-scale farmers to reinvest their profits back into the land, especially into soil and crop protecting measures such as fertilizers, pesticides and soil conservation measures can also be attributed to insecure land tenure from centralization begun under colonialism and finalized by independent African states. In much of the savanna area with marginal soils, the cost of inputs versus the increase in crop yields may not be economically viable.

The nutritional status of Africans has been declining due to limited access to their natural resources and loss of traditional management systems. The creation of “Open Access Resources” has placed rural Africans into a “mining mode”, where natural resources, including soil, are seen as short-term assets that if locals do not take advantage of, outsiders will expropriate. In collusion with the mother country and its private sector, political elites have expropriated rural Africa’s wealth to the capital and overseas, with little or no reinvestment in the people or physical/social infrastructure, and with little or no circulation of money through thousands of hands from the rural areas to African capital as a means of creating a consumer economy.

There has been a failure to industrialize and thereby transform Sub-Saharan Africa’s rich raw natural resources as a means of obtaining added value to stimulate the subcontinent’s economies and to employ the mass rural-urban migration that began in the latter part of the 20th century. This rural-urban

migration resulted/is resulting from a combination of poverty, declining agricultural production, declining hectares of land/farmer and continual drought, typical of this subcontinent and predicted by some to increase with global warming. The net result is that human and livestock populations have become increasingly out-of-balance with their environment, stuck in Phase I subsistence agricultural and pastoralism with little or no urban economy. Without an alternative, poorly educated urban-based Africans work for subsistence wages as laborers “boys” for the few African urban elites and/or for the large expatriate community composed of Western donor “experts” and businessmen. Seeing no future in the cities, many of these poor urban-based Africans have reinvested/reinvest what little wealth they accumulated back into the rural areas, from whence they came, in the form of livestock or extensive agriculture through remittances to their rural families. Thus, inappropriate urbanization has contributed to and compounded an already growing problem, the mining of Sub-Saharan Africa’s rural wealth and the accelerated degradation of its natural systems and/or their conversion into man-made agricultural systems, which over most of subcontinent are not the best land uses (see Chapter 9, Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”).

The fact that Africans are kept in a downward spiraling level of poverty and nutrition, are separated from their families and are living between urban centers or settler plantations and rural farms/homelands has resulted in a breakdown of traditional value systems. This has greatly contributed to the current HIV/AIDS epidemic. This epidemic has had a major impact on women, the primary contributors to rural agricultural production in Sub-Saharan Africa. This in turn has resulted in declining agricultural production and a declining nutritional status especially among children, as well as a further breakdown in traditional social structures.

The politicization of land reform in former settler colonies (e.g., Zimbabwe) risks to further decrease Sub-Saharan Africa's ability to feed itself. Land reform may be politically necessary to overcome past injustices. However, as practiced in Zimbabwe, commercial farms have been given to subsistence farmers or in many cases to non-farming politicians and other connected elites. Uneducated and living a subsistence lifestyle that requires large families, both to work the farms and to assure security in old age, giving subsistence farmers more land is only a temporary fix for one generation. Land hunger will return, as the large progeny from current farm families will not have access to economically viable plots. Per capita land has now declined from about 0.5 ha/person to less than 0.3 ha/ person over the last 30 years in Sub-Saharan Africa. Subdivisions of land will occur and rural Africans will be back to square one; living in poverty and on land that is too small to support a nuclear family. It also needs to be clearly stated that a farm, which supported one commercial farmer and his family will not result in a middleclass among 100's of families who might receive such a farm under land reform/land claim processes.

Land reform as practiced by Zimbabwe is dealing with symptoms rather than really solving Africa's food crisis problems – especially feeding the increasing urban masses. In fact, it is dangerous, since feeding the urban masses is critical to maintaining political stability on the Continent. As currently practiced, land reform is actually decreasing the ability of Africa to feed these urban masses since it is taking commercial land out of production. Making Africans increasingly food-aid-dependent is in the interest of Western donors and NGOs who may wish to control Sub-Saharan Africa politically and economically in order to access cheap raw products they need to stimulate their economies, and/or to impose their value systems by creating more parks and protected areas in the name of biodiversity. This would further disenfranchise, impoverish and alienate rural Africans from their natural resources, which in some cases may result in further

eco-genocide. As importantly, a global grain deficit over the last few years and increasing conversion of grain to ethanol/bio-fuels could eventually prevent the world from feeding Sub-Saharan Africa, especially if global warming continues to result in a reduction of global food production. Africa must start planning for its own future, rather than allowing others to plan and dictate to it.

5.13.3 Possible Way Forward

How can Africa escape this downward spiral in agricultural production? The following may provide some ideas for “The Way Forward”, but only Africa can implement these ideas and make them successful within the socio-cultural and political contexts of the Continent.

The 27% of Sub-Saharan Africa that is conducive to commercial agriculture that can feed the urban masses needs to be identified. Where land is not over-populated or already degraded, a continental-wide plan needs to be developed to assure that this land can help Africa feed itself, operating it on a commercial basis. Unfortunately, much of this land is already heavily populated (e.g., Rwanda, Burundi, Southwest Uganda, Kikuyu Highlands of Kenya, Ethiopia) and experiencing severe soil degradation. Coastal countries such as Ghana and Ivory Coast, with high potential lands are beginning to feel the pressure of desertification further north, with mass migrations of people southward in search of land. Other potential high agricultural yield areas are in major conflict with wildlife and traditional pastoralism, such as the high altitude grasslands Tanzania and Kenya. Only the people of these countries can decide what direction these land uses will take, as natural areas or food producing areas.

Sub-Saharan Africa must develop regional markets for these grains and get away from seeing subsidized handouts from Western donors as an alternative to Africa

being able to feed itself. This may require joint-ventures between the private sector (e.g., commercial white African farmers, multi-national agro-industry) and small-scale farmers along with the use of genetically modified (GM) crops and fertilizer/pesticides to achieve this goal. Pilot programs, creating partnerships between white commercial “mentor” farmers and small-scale farmers, are beginning to take hold in South Africa and need to be encouraged across the continent where such potential exists.

In some cases, it may be more affordable to import certain grains (e.g., rice) in the short-run and maybe even in the long-run. In some cases, cash crops (e.g., tobacco, cocoa, tea, coffee, etc.), especially if they are transformed/beneficiated in Africa, may provide viable alternatives to food self-sufficiency through providing cash for food security, giving Africans in both urban and rural areas the ability to buy their food regardless of its origins. Thus, Sub-Saharan Africa’s policies must lead to a blend of food self-sufficiency combined with food security, not one or the other.

Irrigation and “Green Revolution” technologies may be of some help, but must be carefully integrated into national plans to assure that they do not destroy traditional ecological and production systems (e.g., by dams associated with irrigation) and do not result in further soil degradation, especially salinization. Where dams have destroyed floodplain ecosystems (e.g., Senegal River Valley, Zambezi Delta), controlled flooding to bring these systems back into production should be strongly considered. Water for irrigation will have to fit into other needs such as the partitioning of available water for industrial and potable needs, and in some cases the sharing of this resource between countries.

There is a crying need to support agricultural research and extension services to the estimated 70 million smallholder families in Sub-Saharan Africa, many on

marginal lands, including appropriate and cost-effective technologies such as small-scale irrigation technology, the use of locally manufactured phosphate fertilizers, and other soil conservation technologies that link traditional knowledge to modern concepts.

Agricultural and land use intensification will be necessary to help preserve the environment, including nature reserves, wetlands, fragile areas, game reserves and mangroves. On the medium/low potential lands constituting 47.5% of Sub-Saharan Africa, the cost of inputs such as fertilizer versus increases in yields may not be not cost-effective. Lower cost Low External Input (LEI) technologies such as Integrated Nutrient Management (INM) may be required in such cases. There is a need for agricultural extensionists and anthropologists to work with African elders to capture traditional knowledge about INM (e.g., traditional use of fallow, legumes, crop rotation, green and animal manure, inter-cropping, etc.) and other natural resources, both technically and socially.

Research needs to investigate enhancing production of traditional drought tolerant grains such as developing improved varieties of sorghum and millet, as well as sustainably managing the soils on which these crops are produced.

The current population of Africans farming, an estimated 60-70% of the labor force, is not sustainable. Young Africans are abandoning the impoverished and environmentally degraded rural areas for the bright lights of the urban slums of Africa's increasing mega-cities, looking for new opportunities that are few and far between. Today, they are trading one place of poverty for another. Most are uneducated and ill-prepared to take advantage of the globalization process.

African governments and the international community must take advantage of this movement away from the land. The land cannot continue to support the majority

of the continent living rural subsistence life styles (nor could Europe or America), without further jeopardizing soil quality and thus agricultural production as well as the continent's remaining natural areas, which are becoming "hard-edged" "Islands of Wildlife" surrounded by people, the opposite of what existed at the beginning of the 20th century. However, to take advantage of this movement, an emphasis must be placed on education at all levels, primary, secondary and tertiary, to allow Africans to join a global economy in these urban settings.

As a part of this educational program, there is also a need to develop agricultural training and "Future Farmers of Africa" programs in primary and secondary schools for those youths who choose to remain in rural settings. In addition, taking advantage of Africa's racial diversity, as young Africans graduate from tertiary agricultural programs there is a need to develop programs with commercial farmers and agro-industries to have them "apprenticed" on these farms until they can run and manage such operations, from planning crop production to managing farm labor. Also, technologies such as drip irrigation may have to be adopted to make these processes sustainable. Once again, South Africa has pilot programs moving in this direction that the rest of Africa should emulate.

Land reform must be de-politicized in Southern Africa to assure that commercially viable agricultural lands can continue to feed the region.

It has also to be recognized that in the majority of Sub-Saharan Africa's savannas will never be a breadbasket for the continent due to physical and chemical limitations of the soils, and vagaries of the climate (e.g., low and erratic rainfall, high temperatures and high evapotranspiration rates). One has to take advantage of the best land uses in these savannas such as wildlife, forestry, fisheries, pastoralism and in some cases long-fallow agriculture possibly linked to INM. In

addition, training has to be provided to rural Africans to sustainably manage these resources.

The ownership of natural resources and land should be devolved back to the rural Africans. In addition, the pros and cons of communal versus individual ownership property and associated resources should be carefully assessed within the framework of rural African societies (see Chapter 9, Section 9.7.2.1, Devolution through policy reform, land and resource tenure) and as a means of ensuring the ecological integrity of these areas. Dealing with land tenure and taking both land and natural resources out of corrupt and inefficient governments is considered critical to sustainable resource use and biodiversity. The government's role then becomes one of facilitator, advisor and extensionist to rural communities as opposed to dictator and policeman. This step, though it is happening, is far from being successful, since many poorly paid bureaucrats live more from the resources of rural Africans than from their own low salaries. They are thus reluctant to "let the resources go" back to their rightful owners.

In turn, rural Africans should be helped to start their own "community-owned" companies (e.g., ecotourism, safari, agricultural, etc.) that fit into their socio-cultural framework and which assure that the majority of net profits stay within rural Africa, thereby serving as a catalyst for development. This will help create a consumer society and healthy children capable of learning and able to afford an education that will allow them to fit into a global society, helping to take pressure off the rural resource base. These "companies" can pay taxes like any private sector. The shareholders of the companies, the heads of households, can also pay taxes if income is distributed at this level. This will negate the felt need by African governments to take the value of these resources directly (income paid directly to governments by expatriate tourism, safari hunting, logging, oil and mining companies to governments that bypasses rural stakeholders), a major

reason that rural Africans remain in a perpetual state of poverty on the richest continent in the world.

This implies a win-win relationship with the West in which they introduce their technologies through the Western private sector to help Sub-Saharan Africa industrialize. The raw products on the subcontinent would be transformed in factories built in carefully selected urban centers of Africa that can take advantage of the regional populace without placing undue pressure on local resources such as water, forests and wildlife. Agriculture can serve as the basis for this technological revolution. In the 21st century, Sub-Saharan Africa must go through the same urbanization, industrialization and Information Technology (IT) evolution experienced by Europe and North America in the 20th century, where for instance less than 2% of the people in America fed the majority living in urban centers. If not, in addition to the future of civil society, Africa's natural resource base and revered mega-fauna will be in jeopardy. Anarchy will reign on the subcontinent and civil wars over scarce resources will increase, while mega-cities will be plagued by crime (e.g., Dakar, Lagos, Abidjan, Nairobi, Johannesburg, etc.) and any hope for Foreign Direct Investment (FDI) will be lost, as capital and technology flee the Continent.

Trade barriers, dumping subsidized food and other products in Africa, and other Western approaches that keep Africa marginalized must be halted.

Finally, helping Sub-Saharan Africa to create an educated middleclass will result in smaller, healthier and better educated families, decreased population growth rates, which, are currently exceeding increases in agricultural production, decreased rates of HIV/AIDS and a citizenry that holds its leaders accountable.

Capitalism is based on maximizing profits at all costs and in creating win-lose relationships with the rest of the world. Until now, Western Capitalism has failed the developing world every bit as badly as communism. Africa's New Partnership for Africa's Development (NEPAD) asks both Western governments and their private sector, in return for appropriate policies and good governance, to turn from exploitation for short-term gains to investment in a win-win relationship that in a global society will give Africans and their natural resources, especially their unique mega-fauna, a hope for the future.

Many of these latter issues are discussed in future chapters.

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Chapter 6

6.0 HABITAT DEGRADATION, LINKED TO COLONIAL/POST-COLONIAL POLICIES AND WATERING POINTS/BOREHOLES IN SUB-SAHARAN AFRICA

“When Will They Ever Learn, When Will They Ever Learn”!
 (from rock song over boreholes in Chad *In:* Flack, 2003).

The next three chapters look at the impacts of some technological interventions, which are inappropriately used on the African continent, namely boreholes, dams and sewage in coastal areas. In terms of boreholes and sewage, misuse tends to be out of ignorance. The misuse of dams, however, generally takes place with a clear understanding of their catastrophic impacts on people and the environment. This is because dams mean big money for all stakeholders, except for the rural poor, who lose out considerably.

In the arid areas, comprising about 48.2% of Sub-Saharan Africa (Table 6.1), livestock production is one of the most appropriate types of land use (Swallow & McCarthy *In:* McCarthy, Swallow, Kirk & Hazell, 2000). This includes the savanna biome that makes up between 70-75% of Sub-Saharan Africa and cuts across these classifications of aridity. It is found in areas with rainfall ranging from a lower limit of 350 mm rainfall/year grading into desert (Sholes, 1997 *In:* Cowling, Richardson & Pierce, 1997) to an upper limit of about 900 mm of rainfall/year (Reilly, *pers. comm.*) grading into woodlands and open semi-deciduous forests (Sholes, 1997 *In:* Cowling, *et al.*, 1997) that are best used for wildlife and livestock (see Chapter 5).

Table 6.1: Land area in Africa by aridity zone (millions of km²)

	North	Sahel	South	Others	Total	Sub-Saharan	% Sub-Saharan
Hyperarid	3.85	2.76	0.08	0.0	6.70	2.84	11.7
Arid	0.98	3.49	0.54	0.03	5.04	4.06	16.8
Semi-arid	0.37	3.04	1.59	0.13	5.14	4.76	19.7
Dry sub-humid	0.15	1.50	0.82	0.22	2.69	2.54	10.5
Humid	0.09	2.60	1.28	6.13	10.10	10.10	41.7
Total	5.45	13.39	4.31	6.51	29.66	24.21	

Source: Extracted from UNEP (1992, Table 0.1 *In:* Swallow & McCarthy, 2000 *In:* McCarthy, *et al.*, 2000) with permission, International Food Policy Research Institute (IFPRI).

Le Houerou (1989 *In:* de Haan, Steinfeld & Blackburn, 1997) estimates that in Africa there are as many as 3,500 plant species on which the continent's herbivores feed, compared to less than 150 species on which humans depend.

African rangelands evolved under indigenous multi-species systems typically carrying 15-25 ungulate species (Cumming, 1994 *In:* Bond, Child, de la Harpe, Jones, Barnes & Anderson, 2004 *In:* Child, 2004). Though the rangelands had been exposed to domestic livestock for about 2,000 years, it took about 100-150 years for well under 10% of the herbivore biomass on Sub-Saharan Africa's savannas to be in the form of wildlife. This was the case by the 1980s (Cumming & Bond, 1991 *In:* Bond, *et al.*, 2004 *In:* Child, 2004). Outside parks and protected areas over most of Africa, wildlife had no value to the commercial farmers until the mid-1960s. For most rural Africans this is still the case, though Community-Based Natural Resource Management (CBNRM), taking off around 1980 in Southern Africa, began to provide some benefits in communal areas in an attempt to promote conservation through valorization of the resource (see Chapter 9, Section 9.4, ORIGINS OF CBNRM IN AFRICA). In fact, in many instances, livestock has been (e.g., white commercial ranchers in colonial Zimbabwe) and continues to be (e.g., Botswana) subsidized, providing it with an artificial economic advantage over wildlife as a land use.

Many Western range management experts have failed to understand the ecological and cultural constraints of increased livestock production in the Sahel and dry savannas of Africa. Both international and national politics often result in inappropriate decisions being made in the name of “development”, with the result that habitat is degraded and people become poorer rather than richer because of these interventions. This is especially the case in attempts to turn nomadic cultures, adapted to the ecology of their region, into sedentary lifestyles as a means of controlling what might be considered possible radical elements of society.

Artificial watering holes for both livestock and wildlife have been placed in African savanna environments, often in traditional rainy season dispersal areas where water is the key limiting factor to herbaceous production during the dry season. This has been done without fully understanding the impact on the habitat, transhumance or the inter-relationships between species. In many cases, the net result has been: 1) degraded habitat, 2) a decrease in biodiversity, 3) destabilization of wildlife populations by water-dependent ungulates and elephants displacing rarer water-independent species, 4) increases in predator impacts on prey populations, 5) worsening animal mortality during drought and 6) extensive pastoralists being forced into an intensive management system for which they are ill-prepared, with the net result that they become sedentary around artificial water holes. In very low rainfall areas, very often for 20 km around the watering point, the vegetation will be denuded, creating a piosphere defined as a radiating zone of attenuating animal impact away from a concentrator (e.g., mineral licks, bedding grounds, etc.). Thus, a poorly placed watering point can result in a reduction in vegetative cover, changes in soil chemistry and soil erosion. If the artificial water holes are close enough together, this can result in human-made desertification. This is the case for livestock and to a lesser degree wildlife populations.

Oldeman, Hakkeling and Sombroek (1991 *In: de Haan, et al., 1997*) estimate that 680 million ha of rangeland world-wide has become degraded since 1945, while Dregne, Kassas and Rozanov (1991 *In: de Haan, et al., 1997*) argue that 73% of the world's 4.5 billion ha of rangeland is moderately or severely degraded.

6.1 IMPACTS OF BOREHOLES ON PASTORALISM

6.1.1 Water and Savanna Ecology

Across the savannas of Africa, natural vegetation (range and fallow), crop residues and water were/are the main resources used by pastoralists. Water is of particular importance because it largely determines the value of other resources, such as the grazing resources of annual and perennial grasses and woody vegetation. It is the limiting factor determining how long livestock can remain in an area. African rangeland (at least many species within it) is very resilient and capable of rapid regeneration during the rainy season, despite being trampled or grazed down to the surface.

Savannas have a number of limiting factors, specifically the nitrogen and phosphorus compounds available to plants. These limitations are exacerbated by dry periods, as water is necessary for leaching of chemical inhibitors from leaves before the microbial breakdown of the detritus layer that recycles nutrients can take place. These inhibitors are adaptations to browsing defense (e.g., tannin¹⁰⁷ build-up in mopane leaves from over-browsing by kudu) (Scholes, 1997 *In: Cowling, et al., 1997*).

¹⁰⁷ As kudu, impala or other browsers place more pressure on woody plant species, tannin builds up in the leaves. Tannin kills bacteria in the stomach, which are necessary to digest leaves. In extreme conditions, when an area is over-browsed, tannin levels may be so high that sufficient stomach flora are killed, resulting in the animal starving to death (Thomson, 2003).

Besides limiting factors, savannas also have a number of drivers such as fire, with rainfall being the primary force. It has been demonstrated that a linear relationship exists between rainfall and the above ground primary production of up to 900 mm rainfall/year. About 50% of the primary production in savannas is below ground. In Southern Africa's savannas, net primary production is 500-1,500 grams/m²/year of which 90% or more is typically produced by grasses. Depending on the situation, however, herbaceous layer production can vary from 5-95% (Scholes, 1997 *In: Cowling, et al.*, 1997). Hulme and Kelly (1993 *In: Swallow & McCarthy*, 2000 *In: McCarthy, et al.*, 2000) show that 83% of the variation in aerial extent of the Sahara between 1980 and 1989 was explained by variations in annual rainfall. Studies conducted at field sites in Kenya (Ellis & Swift, 1988; 1992 both *In: Swallow & McCarthy*, 2000 *In: McCarthy, et al.*, 2000), Senegal (Hanan, Prevost, Diouf & Diallo, 1991 *In: Swallow & McCarthy*, 2000 *In: McCarthy, et al.*, 2000) and Mali (Hiernaux, 1993) found that herbage yields depended almost completely on rainfall.

Likewise, the regional production of large mammalian herbivores is proportionally related to rainfall total, though total biomass is two to three times greater in regions of high soil nutrient status than in areas with low soil fertility (Owen-Smith & Danckwerts, 1997 *In: Cowling, et al.*, 1997). This relates back to grass and vegetation production. Finally, in the savannas, disease epidemiology is often considered a response to drought situations (e.g., anthrax) as a means of protecting the overall health of the ecosystem.

6.1.2 Carrying Capacity and Sub-Saharan African Savannas

Linked to rainfall and climate, pasture productivity is variable and the theory of constant carrying capacity is no longer considered valid (Moore, Bertelsen, Diarra, Kadio, Cissé & Wyeth, 2000). Adams (2003 *In: Adams & Mulligan*,

2003) believes that due to the continuing fluctuation in climate and thus available fodder from year to year in the semi-arid rangelands of Africa, the concept of carrying capacity is only relevant in social or economic terms rather than in ecological terms relating to animal and plant densities.

We must also consider here the Eurocentric preoccupation with maintaining the vegetative component of savannas, especially grasses, resulting in what to Africans and many ecologists has resulted in incomprehensible no-burn policies. Europeans, coming from high rainfall areas, were/are accustomed to high grass and vegetative cover year-round, except during extreme droughts. In African savannas, the real value of grasses takes place over a brief period of weeks or months following inconsistent rainfall events. Grasses, having evolved within these “events”, are however also in an entirely intact state during droughts, when all species are present in other dormant life stages (e.g., seeds, geophytes¹⁰⁸).

Thomas and Middleton (1994 *In: de Haan, et al., 1997*) show that arid regions contain dynamic and highly resilient ecosystems, with a strong capacity to regenerate rapidly when the rains return.

“The new paradigm in range management for dryland Africa is based on the ‘nonequilibrium ecological theory’ in range ecology” (Ellis & Swift, 1988; Westoby, Walker & Noy-Meir, 1989; Niamir-Fuller, 1996 all *In: Grell & Kirk, 1997 In: McCarthy, et al., 1997*). “This theory recognizes three main characteristics of arid ecosystems: ecological variability, unpredictability, and resilience” (Grell & Kirk, 2000 *In: McCarthy, et al., 1997*, Excerpted with permission from the International Food Policy Research Institute).

Scoones (1995 *In: Cullis & Watson, 2005*) raises the concept of equilibrium and non-equilibrium environments. Equilibrium environments tend to be in more

¹⁰⁸ Sub-surface portions of perennial grasses that can withstand drought conditions until the next rains.

temperate climates where rainfall and thus vegetation are more predictable, as is carrying capacity. Exceeding carrying capacity can result in a negative impact on vegetation. Non-equilibrium environments, as in the savannas of Sub-Saharan Africa, tend to have highly fluctuating rainfall and thus carrying capacity:

- Drought (rather than stocking numbers) determines livestock numbers and vegetation status while grazing has a limited effect on grass production over time, making permanent degradation unlikely.
- Flexible movement is crucial to maintaining the productivity of African rangelands, which varies greatly over space and time.
- African pastoral production systems are geared towards a number of different livelihood objectives, which include milk production, meat, manure, draught power and transport. Interventions are aimed at boosting single outputs (e.g., meat), using simplistic management tools (e.g. fixed carrying capacity) as part of standardized models (e.g., ranches) that are unlikely to work.
- Communal rangelands are often under-valued for the multitude of products/resources that are harvested in addition to livestock, including assets such as wildlife, wild foods and medicines. This makes them up to twice as productive/ha than a single use cattle ranch.

“Defining conditions of land degradation under a non-equilibrium theory is more difficult than under an equilibrium one. Remote-sensing work has found that inter-annual variations in rainfall and vegetation structure are so high that they require decades-long monitoring to detect expansion or contraction of the Sahara” (Tucker, Dregne & Newcomb, 1991 *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

More recent research (Ellis & Swift, 1988; Behnke, 1997 both *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000) has provided support for the following arguments:

- The scale and magnitude of persistent environmental decline in dryland Africa has been overestimated.
- The role of livestock grazing in these changes has been overestimated.
- The pattern of anthropogenic land degradation is much more severe around permanent settlement sites than it is in open rangelands because of concentration of pressure (deforestation, over-cultivation, and over-grazing) (Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000).

Cullis and Watson (2005) suggest that the mobility afforded livestock on communal rangelands is more conducive to sustainable range management in the highly variable rainfall of Sub-Saharan Africa's semi-arid and arid areas than fencing or permanently settled areas that reduce and/or eliminate this mobility and can result in various phenomena, such as bush encroachment. Bush encroachment may be defined as

"the suppression of palatable grasses and herbs by encroaching woody species often unpalatable to domestic livestock. Therefore, bush encroachment reduces the carrying capacity for livestock" (Ward, 2005).

In the 1980s, the principal author visited a missionary friend in Linguere, Senegal, on the edge of the Ferlo during the peak of a drought. The ground was barren of any grasses with little or no wildlife to be seen. During the next year, the rains were prolific and what had appeared to be desert the year before was now covered in grasses and blooming bush, lush with francolin and warthog that had been virtually absent for years.

The concept of fixed carrying capacity in savanna environments has been disproved. De Haan, *et al.* (1997) give an example of a program in Senegal undertaken by GTZ that proved this point. Six plots of 200 ha each with fixed stocking rates were monitored for 12 years. The fixed stocking rate concept proved incompatible with the highly variable rainfall and thus forage, resulting in stocking rates being balanced with forage in two of the 12 years, three years being over-stocked and four years being under-stocked: "...the impact on vegetation was more negative than positive, owing to under-utilization, a decline in quality of pasture, and a thinning out of drought-resistant fodder species. Third, while animal production was good in the best years, animal vulnerability increased in bad years". This demonstrated the limits of the concept of carrying capacity in a system not at equilibrium and the difficulties of applying a closed system model over large areas, the reduction in traditional animal mobility and the reduction in symbiotic relations between herbivores and the plant community that occurs in an open system (de Haan, *et al.*, 1977).

6.1.3 Traditional Pastoralism in Sub-Saharan Africa

"The term 'pastoralist' is defined as a mode of production where livestock make up 50% or more of the economic portfolio of a smallholder" (Sandford, 1983 *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000). "The term 'transhumance' refers to regular seasonal movements of livestock between well-defined pasture areas (dry to wet season, or low to highland). It can cover a wide range of pastoral production systems, ranging from fully transhumant systems, such as among the northern Mauritians and Namibians, to systems such as used by the Nilotic tribes of east Africa, the Berber of the High Atlas, and herders in Morocco and Ethiopia. Transhumance also applies to settled populations who send their livestock short distances to pasture, such as in Zimbabwe. All these systems have several elements in common:

- They rely on common property (pastures, forests, and natural waters).

- They normally occupy arid lands with less than 400 millimeters of annual rainfall.
- Mobility is managed by herders, rather than by fencing" (*In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

The recognition of the importance of mobility for pastoral systems is not new, but what is new is a convergence of several scientific fields (ecology, anthropology, economics and institutions) into a more or less holistic paradigm (Niamir-Fuller, 2000 *In: McCarthy, et al., 2000*). Pastoralists traditionally used mobility and other herd management strategies, adapting to seasonal and erratic rainfall of the savannas (Moore, *et al.*, 2000; Swift & Hamilton, 2001).

"The evidence shows that there is no sustainable alternative, economically or ecologically, to the pastoral herders' opportunistic strategies for managing natural resources in arid and semi-arid zones" (Behnke & Scoones 1991; Behnke, Scoones, & Kerven, 1993; Grell, 1994; Scoones, 1995; Thébaud, Grell & Miehe, 1995; de Haan, 1996; de Haan, *et al.*, 1997 all *In: Grell & Kirk, 1997 In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

"The classical paradigm for livestock development in Africa, based on sedentarization, privatization and intensification, has, after 20 years, benefited only a very small minority of elite pastoralists...This new paradigm postulates that the greater the unpredictability and variability of a natural resource, the more suited it is to being held and managed communally...The new paradigm not only argues that transhumance is not an archaic remnant of the past, but even asserts that it is a necessary precondition to sustainable development in arid lands" (Niamir-Fuller, 1996 *In: Grell & Kirk, 2000 In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

Thus, "where rural producers live in high-risk environments, such as drylands, and where income streams are uncertain, communal-property systems may be more appropriate as they allow access to other areas: tenure systems that allow flexible and mobile response

to uncertainty provide insurance against environmental risk” (Moorehead, 1994 In: Grell & Kirk, 1997 In: McCarthy, *et al.*, 1997, Excerpted with permission from the International Food Policy Research Institute) (see Chapter 5, Section 9.7.2.1, Devolution through policy reform, land and resource tenure).

“In fact, the drier the ecosystem is, the greater is the incentive to manage the natural resource communally. In arid lands, uncertainty is high, and the risks of production and survival are higher. The risk burden is too much for an individual to bear; therefore, common-property regimes are devised to share the risk and spread the burden. The productivity of arid and semi-arid lands is both marginal and variable, and therefore these areas have a benefit-cost ratio that discourages investment in exclusionary, private, mechanisms” (Dyson-Hudson & Smith, 1978; Bromley, 1989; Ostrom, 1990; Behnke, *et al.*, 1993 all In: Niamir-Fuller, 2000 In: McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

Traditionally, pasture was managed as a “Common Property Resource”. Pastoralists varied herd composition depending on the type of long-term environmental adaptation required, drought and markets (see Chapter 2 for detailed discussions). Adams (2003 In: Adams & Mulligan, 2003) believes that this traditional knowledge over range management still exists. “Agropastoral societies have developed their own strategies for reducing their exposure to losses from droughts and for coping when droughts occur” (Hazell, 2000 In: McCarthy, *et al.*, 2000). These strategies include (Hazell, 2000 In: McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute):

- “Diversifying into crops and livestock, particularly around settlement areas, and diversifying into different animal species (for example, goats, sheep, cattle, donkeys, and camels) and different breeds.
- Carrying extra animals that can be liquidated easily during a drought, for either food or cash.
- Adopting mobile or transhumant grazing practices that reduce the risk of having insufficient forage in any one location.

- Adopting opportunistic grazing practices whereby herd sizes and stocking rates are adjusted as the rainy season unfolds to best match available grazing resources.
- Maintaining reciprocal grazing arrangements with more distant communities for use in drought years.
- Maintaining feed reserves or purchasing supplementary feed, such as hay or concentrate.
- Investing in wells and cisterns.
- Diversifying into non-agriculture, particularly seasonal migration and non-farm employment.

Traditional risk-management strategies have proved effective in managing drought risk and have enabled pastoral societies to survive harsh environments for many millennia. The interplay between drought and traditional management systems also helped keep total herd sizes in equilibrium with the inherent productivity of the pastures, avoiding any long-term degradation of grazing areas. Stocking rates would trend upward between droughts, as herders bred more animals, but then would be knocked down again when the next drought occurred. Fluctuations in herd size closely followed rainfall patterns, and peak stocking rates rarely reached unsustainable levels”.

“The literature on western common-property regimes usually assumes that clearly defined boundaries are a necessary condition for long-enduring institutions of common-property regimes” (e.g., Ostrom 1993 *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000). “Pastoral territorial boundaries today are still characterized by the flexibility of their boundaries” (Moorehead, 1993; Salzman, 1994 both *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute) and access to resources that must be negotiated.

“The inclusive (or porous) nature of transhumant tenure institutions has often been misread as evidence for the lack of institutions governing resource access—for example, a resource open to all. Such conclusions confuse a lack of rigid exclusion (a defined membership) with the lack of exclusionary powers. In fact, outsiders can only use resources with the permission of the group with usufruct rights” (Tubiana & Tubiana 1977; El-Arifi 1979 both *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

For instance, in the Sahel, during the rainy season, Tuareg and Fulani pastoralists traditionally moved animals away from the cultivated zone or floodplains into the drier areas of the semi-arid and arid zones to take advantage of the flush of high quality forage produced by grasses on rangelands and to prevent damage to food crops. At this time, livestock made use of water available from surface ponds. During the dry season, livestock was moved back to the cultivated zone to graze crop residues on harvested fields and/or to natural pasturage on the floodplains (Chapter 2, Section 2.3.2, Pasture and Water). As the dry season progressed further, the vegetation on fallow fields was used as temporary pasture (DeGeorges, 1992; Williams, 1998). Access to dry season grazing land on farmers' fields was negotiated.

"Local-resource scarcity has always been a major constraint to pastoral production in dryland areas and has been the major driving force for development of access options based on institutional and market relations. Pastoral communities have always been aware that their local grazing resources will not suffice for more than three to four months and that they need to secure feed for their herds for the remaining eight to nine months. As such, pastoral communities have developed production strategies based on 'free grazing' obtained mainly through reciprocal grazing arrangements, which act as risk-coping strategies" (Ngaido, 2000 *In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

In Niger, the south–north–south transhumance routes depend on rainfall, with herders from Nigeria coming to graze in the pastoral zone of Niger in the rainy seasons. A reciprocal arrangement exists for the dry season, when herders from Niger graze in the pastoral zone of Nigeria. In recent years, however, socio-economic and environmental changes and increasing demands over pastoral land resources have affected the possibility of pastoral institutions solely relying on such arrangements and ensuring the livelihood of their members. Pastures and pastoral resources are increasingly being appropriated by individual members or

encroached on by herders and farming communities. This is resulting in the loss of local institutions' capacities to provide secure production strategies for their members and is weakening the capacity of communities to enforce resource-management rules and win the support of their members. "This loss of institutional capacity and strength is translated in the rural areas into increasing disputes over common-property resources, increasing environmental degradation, and increasing reliance of pastoralists on the market for the upkeep of their animals" (Ngaido, 2000 *In: McCarthy, et al.*, 2000) (see Chapter 5, See Section 5.11.2, Over-population, Desertification and Instability, Nigeria). To a large degree, this may be related to the human and livestock population explosions of the 20th century and to land/resource tenure issues from centralization policies that have largely disrupted the traditional management regimes of pre-colonial Sub-Saharan Africa (see Section 6.1.4, Impacts of Colonialism and Post-Colonialism on Pastoralism and African Ecology).

The seasonal use of "Common Property Resources" also created opportunities for mutually beneficial exchange relationships between various user groups. The exchanges of grain, crop residue and water owned by farmers for the manure produced by pastoralists' livestock linked crop and livestock production for centuries in the Sahel and served to increase land productivity (Williams, 1998). Similarly, livestock grazing on the floodplains helped recycle nutrients back into the aquatic system with the annual flood, helping to increase fish production in a manner similar to the hippo feeding on both aquatic and terrestrial vegetation. Similar cycles were followed by the Maasai (Adams & McShane, 1992; Mbarnoti, 2003), Tswana herders in the Northwest Province, South Africa (Undisclosed Source, *pers. comm.*), at cattle posts in Botswana (Hitchcock, 2003) and in fact across Sub-Saharan Africa. Colonial and post-colonial governments, for a number of reasons, have failed and/or refused to acknowledge the appropriateness of such relationships requiring mobility and flexibility among

stakeholders as a means of assuring sustainability of both livelihoods and the environment.

“Production of protein/ha of traditional nomadic pastoralists in Mali and Botswana is two- or three-fold higher (and at much lower cost in non-renewable fuel resources) than production from sedentary production systems or ranching under similar climatic conditions in Australia and the USA respectively (Breman & de Wit, 1983; de Ridder & Wagenaar, 1984 both *In: de Haan, et al., 1997*). In addition, arid grazing systems are often multiple-use systems, with wildlife and other plant products being important additional products (*de Haan, et al., 1997*)”.

“Studies in Zimbabwe, Botswana, Uganda, and Mali show that overall returns per hectare (counting all products, not just meat) are higher in mobile pastoral systems than in agro-pastoral or commercial systems (Sandford, 1983; Scoones, 1994 both *In: Niamir-Fuller, 2000 In: McCarthy, et al., 2000*). However, productivity per animal is lower, primarily because of the lack of external supplementation and low veterinary input. Another benefit of mobility is its deliberate use for contributing to pasture sustainability and improvement. The mobility of neighboring pastoral herds is a form of spatial and temporal choreography determined by the nutritional needs of the livestock portfolio, informal rules that determine precedence, degree of concentration and length of grazing (that is, effective grazing pressure), and ‘safe’ distance or dispersion between herds (disease or social relationships) (*Niamir-Fuller, 2000 In: McCarthy, et al., 2000, Excerpted with permission from the International Food Policy Research Institute*)”.

“As an example: risk-management strategies put pastoral communities under different property-rights systems and decision-making spheres. For example, when herders in Niger stay in the pastoral zone, Fulani or Tuareg, tribal leaders facilitate their access to pastoral resources, whereas when they are using grazing corridors and areas in the cropping areas, they rely on village and canton chiefs to give them access (*Ngaido, 2000 In: McCarthy, et al., 2000, Excerpted with permission from the International Food Policy Research Institute*)”.

Perkins (1996) also concludes that traditional cattle posts used by local communities have been shown to be more productive than commercial fenced cattle ranches if all livestock products (milk, meat and draught power) are considered on a per hectare basis. Nor does fenced rotational grazing protect vegetation any better than traditional cattle posts that allowed for some mobility. Unfortunately, through Botswana government support to elites, cattle posts have been usurped from traditional resource users, turning traditional herders into permanent residents around the cattle posts who live on handouts. This has resulted in misuse of the areas (e.g., illegal drilling, increased density of boreholes, over-stocking, depletion of communal grazing reserves by elites prior to moving cattle to their private cattle posts or ranches) (see Section 6.1.4.3, Impacts on pastoralism and range ecology from boreholes and Chapter 11, Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana).

Traditional pastoralists manage their herds with different goals in mind than Westerners or Western trained technicians and this must be recognized. Adams (2003 *In: Adams & Mulligan, 2003*) states that a traditional pastoralist, a commercial rancher and a conservationist may manage for different goals. The pastoralist will aim for high numbers of lower weight livestock that serve as capital and a source of blood and milk, a rancher will have lower numbers of larger higher meat yielding cattle to serve the market place and the conservationist will be looking to maintain the “integrity” of the ecosystem. It may therefore be rational for a pastoralist to run a larger biomass/number of livestock than a rancher or conservationist would in terms of wildlife. This is acceptable as long as the habitat is not degraded or grazed beyond its ability to recuperate. The carrying capacity in numbers of livestock or game varies with the range resources, which in turn will tend to vary with the climatic cycles of Africa (Adams, 2003 *In: Adams & Mulligan, 2003*).

The harmony and balance, in which nomadic pastoralists had co-existed with nature for millennia, was destroyed in less than a 100 years, mostly during the 20th century (GEF, 1998).

6.1.4 Impacts of Colonialism and Post-Colonialism on Pastoralism and African Ecology

The six major factors influencing African savanna ecology and pastoralism are:

- Centralization of control over-grazing rights.
- Compression from appropriation of land for both European settlers and the creation of parks and protected areas.
- Boreholes.
- Sedentarization policies.
- Human and livestock population increases.
- Loss of floodplain habitat from modified downstream hydrology by dams and from attempted conversion to irrigated perimeters.

6.1.4.1 Impacts on pastoralism and range ecology from centralization of control over-grazing rights

As discussed in Chapter 2, access to pasture, like many resources, tended to be controlled by a lineage within a specified territory. Centralization of control over resources associated with colonialism turned managed “Common Property Resources” into unmanaged “Open Access Resources”.

Throughout Sub-Saharan Africa, the colonial state focused its land policy on crop-production systems, with the pastoral sector being left comparatively untouched and neglected. The current resource tenure structures in Sub-Saharan countries are still based on colonial philosophies. “Existing unwritten customary

rights became subject to and intertwined with written land legislation, causing and accelerating a general insecurity of tenure...particularly for those groups that repeatedly had to prove their customary and secondary right..." Despite differing legal systems in the "mother countries", the effects of French colonial land policy were very similar to those of British colonial land policy (Bassett, 1993; Kirk, 1999 *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000). In legal terms, cultivated/occupied land differed fundamentally from "obviously free", unoccupied areas (Feder & Noronha, 1987 *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000).

Private ownership rights existed for cultivated land, while uncultivated land, such as pastures, was considered "land without master" (*sans maître*) or "abandoned land" (*terres vacantes*) due to the French's misunderstanding of the spatial requirements of extensive production systems. Uncultivated land could be released for settlement, be transformed into plantations or be converted into areas for mechanized farming (Kirk, 1994; Le Roy, 1985 both *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000).

"The colonial state could also take possession of the land as state land 'in the public interest' without consulting or compensating former holders of rights to the land...As the centralist colonial state did not appreciate the economic importance that mobility has for livestock production in arid and semi-arid areas...the conceptual problem that common-property regimes were mistakenly seen to be systems of open access was the root cause for colonial policies concentrating primarily on the avoidance of what is now called the 'tragedy of the commons' and its negative impact on resource allocation, management efficiency, and sustainability" (Lane & Moorehead, 1995 *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

"Under the conquest principle, colonial domination was compared with the conquest of a country: land that was property of chiefs or kings accrues to the French state as a result of conquest or

contracts and becomes part of eminent domain (*domaine éminent*). This approach was, in fact, based on a wrong assessment of the position of the chiefs, who in fact only exercised the function of trusteeship. The principle of abandoned land is based on the French Code Civil and says that the state exercises control over such land as part of the state's *domaine privé* (Coulibaly, Keita, Cissé, Traoré & Soumaré, 1991 *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute)".

"In fact, since 1935, all land that had not been used (farmed) for more than 10 years became state land" (Kirk 1999 *In:* McCarthy, *et al.*, 2000) in Francophone Africa. "Thus, resource tenure regulations were put into effect that ignored the logic of opportunistic mobile pastoral livestock keeping and substantiated legal insecurity when, for example, agropastoralists suddenly had to prove their rights to rangeland that had been used temporarily only" (McCarthy, *et al.*, 2000). "The consequences were disastrous for the African population..." (Noronha, 1990 *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

Independence tended to be a continuation of colonialism.

"After independence, many African countries continued to work with the institutional environment inherited from the colonial powers without major modifications...policy makers and administrators (often an urban elite who never had and/or who had lost contact with their origins, de-linking themselves from their rural roots, and who had been trained in Western production systems that are often inappropriate for Africa's savannas) identified indigenous pastoral common property and pastoralists' resource management as inadequate for promoting higher levels of commercial offtake, for limiting stock numbers to the carrying capacity, and for protecting the land from being overused" (Lane & Moorehead, 1995 *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

As in colonial times, due to a lack of understanding for traditional pastoral management systems and tenure,

"the implicit theoretical justification was the social dilemma created by common property, which became well known as the 'tragedy of the commons'...The large majority of countries adopted the colonial principle of state ownership of all land that was either without formal title or constituted 'abandoned land'" (CILSS, 1988; Coulibaly, *et al.*, 1991; Lane & Moorehead 1995; Lawry 1989 all *In:* Kirk, 2000 *In:* McCarthy, *et al.*, 2000). "In remarkable continuity with colonial ideals, the state showed an ongoing interest in enforcing state ownership over land communally used until then. Definitely, more land was transformed into state land than into private property" (Lawry, 1989 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

The nationalization of arid rangelands introduced by many governments in the post-colonial period in Africa and Asia (IFAD, 1995 *In:* de Haan, *et al.*, 1997) undermined the intricate fabric of customary practice. An ecologically well-balanced system of communal land use degenerated into a "free for all" "open access" system in much of Sub-Saharan Africa and India (de Haan, *et al.*, 1997; Steinfeld, de Haan & Blackburn, 1997 all *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000) that "undermined the intricate fabric of customary practice" (Steinfeld, *et al.*, 1997 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000). Moorehead (1994 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute) points out,

"Ironically, nationalization of rangelands has created the very conditions that policy was intended to avoid: ranges are now accessible to people who never had such rights before and who are often not pastoralists, in conditions where there is much less control than former communal ownership systems exercised".

In other cases, traditional management areas were

"replaced by individual farms, such as in Algeria, Botswana and Zimbabwe. Individual farms were too small to permit an efficient use of the erratic rainfall patterns inherent in these areas. In

communal areas, the traditional collective internal discipline in the management of the resources disappeared and over-grazing and land degradation followed" (de Haan, *et al.*, 1997).

Perkins (1996) raises similar issues over fenced ranches in Botswana.

"Government policies since colonial times have favored crops over livestock. High import duties aimed at protecting domestic cereal prices, and subsidies on fertilizers and fuel (acting as an indirect subsidy on tractors), have stimulated the expansion of crops into rangelands" (Little, Horowitz & Nyerges, 1987; Lane, 1991; Niamir, Lugando & Kundy, 1994; Steinfeld, *et al.* 1997 all *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

The more productive pastures are the first to go (Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000). In addition, continuing after independence, the

"colonial state's agricultural policies that tolerated or even supported a creeping expansion of crop cultivation into pastoralists' grazing grounds—and was intensified by the installation of large-scale irrigation perimeters in Mali, Sudan, or Senegal—had a far-reaching indirect impact on property-rights regimes of pastoralists", while the introduction of veterinary services resulted in the build-up of herds" (Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

This is exasperated by the human population explosion of the 20th century, declining fallow periods and the movement of farmers onto marginal lands, often key pastoral areas of transhumants. These policies have upset the economic balance that existed between crops and livestock (Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000) (see Chapter 5, Section 5.5.2.2, Nutrient depletion as a constraint to agricultural production; Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal; Section 5.7.1.3, Improperly planned land tenure and

impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya; Section 5.9.1, Over-population, Land Scarcity and Decreasing Agricultural Production in Sub-Saharan Africa; Section 5.9.3.1, The Sahel, over-population and declining fallow periods and Section 5.11, CONFLICT LINKED TO OVER-POPULATION AND DESERTIFICATION – SCARCE RESOURCES).

Large-scale irrigation schemes tended to take place on floodplains that displaced herders and small-scale farmers and tended to require dams that greatly modified the annual flood cycle that for eons had supported a diverse array of resources. These had included dry season forage, necessary for the survival of this ecosystem and the people, livestock, fish, wildlife, water birds and vegetation integrally linked to the floodplains and floods (see Chapter 7).

“In Senegal, Nigeria, or Sudan, large-scale irrigation systems went hand in hand with the expropriation of autochthonous, jointly administered pasture land and its nationalization, which was followed by the allocation of usage rights over irrigated areas to settlers in the form of formal leasehold” (Kirk, 1994 *In: McCarthy, et al.*, 1997). “Again, livestock corridors were obstructed, water points for animals were converted into sources for irrigation, and exchange relations based on reciprocal property rights between agriculturalists and pastoralists were reallocated in favor of agriculturalists” (Kirk, 2000 *In: McCarthy, et al.*, 1997, Excerpted with permission from the International Food Policy Research Institute).

The exclusion of livestock from traditional dry season grazing areas is discussed in more detail in the case study of irrigation and dams on the Senegal River in Chapter 7 (Section 7.9.3.1, Senegal River) that nearly sparked a war between Senegal and Mauritania.

On the Borana Plateau of southern Ethiopia, traditional pastoralists are rapidly losing their land to peasant farmers.

“Until the socialist revolution of 1974, rulemaking and rule enforcing was the sole preserve of the traditional Borana elders. These elders were resistant to the spread of cultivation and to the privatization of land rights. Thus, even though cultivation started in about 5% of the communities some 40 years ago, it never really took off until the formation of the peasant associations in 1975....Across the 40 communities, an average of 22% of the land is privatized, of which 17% is enclosed cultivated fields and 5% is private calf-enclosures. About 80% of the communities in the sample had some cultivation in the 1997/98 agricultural year. Forty-two percent (42%) of the communities had some cultivation 10 years ago, 28% had some cultivation 20 years ago, and 10% had some cultivation 30 years ago...Peasant associations are local administrative units that are supported by the national government. Peasant associations in Borana follow laws promulgated at the national and regional levels that support the allocation of private use-rights to households wishing to cultivate. In at least one instance, a single peasant association was recently given jurisdiction over two *ardas*¹⁰⁹ and individuals from each *arda* rushed to claim rights to individual plots of land. Increases in cultivation were also stimulated by the national government’s special support program for cultivation. Improved seeds, fertilizer, and extension assistance were made available in the 1980s” (Swallow & Kamara, 2000 *In: McCarthy, et al*, 2000, Excerpted with permission from the International Food Policy Research Institute).

In Mali, nationalization of resources by the colonial authorities and the post-colonial governments provided all Malians equal use rights to these resources. However, over time, the complex rules governing access began to unravel, eventually leading to over-exploitation of pasture and other resources (DeGeorges, 1992; Williams, 1998). This included a breakdown of the integrate management system for pasturage and other resources in the Inner Niger Delta

¹⁰⁹ Subdivision of land set aside for pasture, see Chapter 2, Section 2.3.2, Pasture and Water, for a description.

(Williams, 1998; Hesseling, 1994 both *In: Kirk, 2000 In: McCarthy, et al., 2000*), as described in Chapter 2. This phenomenon has been common across the continent, where the colonial powers and present-day governments own the land and the resources, as well as most of the derived wealth. This gives little incentive for local communities to sustainably manage anything. In fact, as the local communities feel the loss of control over pasture and other resources, it encourages mining the resources for short-term gains – creating an “open access” environment.

6.1.4.2 Land compression from expropriation of land for both European settlers and the creation of parks and protected areas

This was discussed extensively in Chapter 3 and has mainly been a phenomenon of settler colonies in East and Southern Africa. Europe’s idea of “Wild Africa” was created by the establishment of parks such as Amboseli and Maasai Mara in Kenya, and Serengeti, Ngorongoro, Manyara and Tarangire in Tanzania. These parks and game reserves were formed by displacing indigenous people and compressing them into smaller and smaller areas. These protected areas had traditionally served as critical dry season grazing areas for local inhabitants’ livestock. The formation of parks combined with expropriation of land by white settlers has greatly reduced the livestock carrying capacity for traditional pastoralists, while impacting on their traditional migratory movements between wet and dry season ranges.

The Orma population, standing at 40,000, currently occupies an area to the west of the Tana River, Kenya, which has an average annual rainfall of 400 to 600 mm spread over two rainy seasons (Jaetzold & Schmidt, 1983 *In: Swallow & Kamara, 2000 In: McCarthy, et al, 2000*).

“Until the middle of this century, the Orma had abundant grazing resources that were governed by a loosely defined set of norms. These resources became increasingly scarce as the Kenyan government expropriated large tracts of land to establish irrigation schemes, game reserves, and government ranches in the 1950s (Swallow & Kamara, 2000 *In: McCarthy, et al, 2000, Excerpted with permission from the International Food Policy Research Institute*”,

as well as due to encroachment by Turkana herders because of drought. As a result:

“the Orma devised a system of restrictions on the use of pastures near their villages. This effectively excluded transhumant herds and established a local commons. The Orma Council of Elders oversaw the management and use of the common pastures. This Council was a decentralized form of government that relied on consensus of community members. Individual community members enforced the decisions of the Council” (Swallow & Kamara, 2000 *In: McCarthy, et al, 2000, Excerpted with permission from the International Food Policy Research Institute*).

Displacement of Khoikhoi pastoralists by Dutch settlers began in 1652, converting their lands to fenced farms for crops and continual grazing. This disrupted their traditional production systems through bringing them into a barter system, exchanging livestock for trade goods, including alcohol. These developments, together with the elimination of internecine wars and the eruption of the small pox epidemic of 1713, which killed up to 30% of the population, resulted in the Peninsula Khoi of the Western Cape South Africa, no longer being self-sufficient: they became unviable both socially and economically. Following a skirmish in 1659, a captured Khoikhoi responding to a question about why they were at war with the Dutch asked why the Dutch had ploughed and sowed corn on their best pasture lands (Smith, 1992). The Khoikhoi were eventually forced to work as hired hands or pushed into urban centers by the beginning of the 18th century.

The idea of depicting Africa's savannas as wilderness untouched by human hands is fundamentally flawed (Adams, 2003 *In: Adams & Mulligan, 2003*). In fact, humans have played a key role in the maintenance of savannas through the burning and harvesting of woody species for charcoal and firewood. In large parts of the subcontinent, humans overplayed their role, which led to desertification and was compounded by the human and livestock explosion in the 20th century and colonial/post-colonial policies. The process of land confiscation and compression, especially in the creation of parks and protected areas, continues in the 21st century, as is discussed in Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers. This process is taking place through the investment of Western money and is driven by Western "ecological missionaries", mostly NGOs, who collude with African government elites and the private sector (e.g., tour and safari operators, logging companies, etc.). The NGOs act for ideological reasons in the name of biodiversity conservation, governments as a way of enriching the elite, and the latter as a cover to plunder Africa's real wealth – its natural resources while the majority of rural Africans remain poor, uneducated and are pushed into geographically limited areas that cannot support them ecologically or economically.

6.1.4.3 Impacts on pastoralism and range ecology from boreholes

What cash crops have done to Sahelian farmland, deep borehole wells have done to savanna pastures. A thousand feet or more beneath the Sahel lay vast reservoirs of water that could be tapped by deep wells. The effect of the boreholes was simply to make pasture instead of water the limiting factor on cattle numbers, so that the inevitable population collapse, when it came, was all the more ferocious (Hardin, 1977). This has been true across Sub-Saharan Africa.

Beginning in the colonial era of the 20th century, in the dry rangelands of the Sahel from Senegal to Chad, “Western rangeland experts” determined that the limiting factor to increasing livestock carrying capacity was water. Across the Sahel, boreholes were constructed. Perennial boreholes replaced traditional temporary shallow watering holes, encouraging sedentarization. Concomitantly, as human populations increased and fallow periods began disappearing, farming expanded further and further into rangelands. Extensive pastoralists, who moved between wet and dry season grazing areas, were placed into an intensive management situation for which they were ill-prepared, both culturally and technically (Princeton University, 1986). Continuing into the 21st century, across arid Africa, countries have subsidized (often with foreign aid money) the drilling of boreholes, creating 1000s of mini oases. Peasants and nomads flock to these boreholes to take advantage of the “free” (unowned and unpriced) water and land. This allows livestock numbers to build up, encourages sedentarization, results in habitat degradation and displaces wildlife.

Between 1947 and 1961, France spent over 50,000 old francs on the Sahelian area of Mauritania, Senegal, Mali, Niger and Chad, providing boreholes and artificial or controlled natural ponds for cattle herds. All these areas became over-grazed (Dumont, 1966; Dumont, 1968 *In: de Vos, 1975*). Great Britain did the same to appease the Maasai for the land they had confiscated for settlers and to create parks and reserves (Adams & McShane, 1992).

“The provision of 1000s of ‘public’ wells and boreholes in dryland areas after independence further contributed to the destruction of the autonomous, efficient allocation of scarce water resources. The new public facilities offered all groups increased access to new pasture grounds, and access by foreign herders became uncontrollable for the local groups. In Mauritania and in Sudan, this process of undermining locally based property rights was aggravated by applying Islamic resource laws, which provided

much broader access to water and grazing resources than many customary systems did" (Lane & Moorehead, 1995; Kirk, 1994 both *In: McCarthy, et al.*, 1997, Excerpted with permission from the International Food Policy Research Institute).

In the Sahel, the installation of boreholes was undertaken with little or no understanding for the impacts on traditional management systems or pasture quality. Culturally, livestock, as opposed to money, were seen as wealth. Thus, few if any livestock were taken off the range. With the year-round availability of water and improved veterinary care, herd sizes were increased, adding to the pressure on the range.

Livestock cannot walk more than 15-20 km/day between grazing areas and water while maintaining their condition. Linked to this, boreholes must be carefully managed (opened or closed) in order to control grazing pressure (de Vos, 1975). This is something that was rarely addressed by donors and developers after they had dropped this technology on local pastoralists. As migratory Sahelian herders were untrained in intensive grazing practices, they became sedentary around boreholes in rainy season grazing areas, because of the availability of year-round water supplies, rather than opening and closing boreholes and moving livestock as range was grazed down. Each day, livestock migrated out from the boreholes to feed, until 20 km circles of degraded rangeland were created (Princeton University, 1986).

In the Sahel of Africa, traditionally,

"heavy grazing during the dry season resulted in areas of denudation up to about 30 km from a well, but wells were spaced at large intervals so most of the land was ungrazed. With bores (boreholes) now at less than 30 km intervals most of the land area is denuded by the end of the dry season" (Glantz 1977 *In: Landsberg, James, Morton, Hobbs, Stol, Drew & Tongway, 1997*).

Le Houerou (1979 *In: Smith*, 1992) states that

“putting high yielding boreholes into operation to water cattle allows enormous concentrations of herds during the dry season. In the Sahel and particularly in Niger, it has been known for boreholes to water 40,000 to 50,000 head. Because the animals cannot go more than 20 km from water sources during the hot dry season, in a very few years the pasture is entirely destroyed”.

It is estimated that between 1957 and 1968, 1,000 boreholes were installed in Sudan, which led to the stripping of 200,000 km² of its grass cover (Rosenblum & Williamson, 1990). Rapp (1976 *In: Landsberg, et al.*, 1997) reports that “cattle grazing around artificial water in northern Sudan has resulted in the denudation of vegetation and soil compaction over areas of up to 100 km diameter” (Landsberg, *et al.*, 1997). Where boreholes were close enough together and the concentric circles connected, deserts were formed. If one flies across the Sahel today, these interconnected circles of desertification become obvious (Princeton University, 1986). This continued during the drought of the 1960s/70s (Williams, 1998) and into the present with support from:

- Western donors in Niger (Salopek, 2001) and Namibia (Devereux, Rimmer, LeBeau & Pendleton, 1993 *In: Devereux*, 2001 *In: Devereux & Maxwell*, 2001);
- Missionaries in Maasailand, Tanzania (principal author personal observations); and
- Governments, Botswana (Hitchcock, 2003) and individuals (Hitchcock, 2003).

In the Sahel, foreign aid programs brought in more wells and boreholes, which increased concentrations of people and animals. Extensive animal health campaigns resulted in vastly increased numbers of stock. The desertification

process was started (van Voorthuizen, 1978). These actions were often taken in an attempt to slow the movement of pastoralists southward during the drought of the 1970s, as a means of stopping them from encroaching on small-scale farmers. In the end, this only worsened the impacts of the drought and often resulted in ethnic conflicts (Martin & O'Meara, 1995). For example, the Illabakan Tuareg of Nord Tahoua, Niger initially responded favorably to deep boreholes until other Tuareg groups and Fulani started basing themselves around the borehole at In Waggeur, heavily over-grazing the pasture. In reaction, the Illabakan Tuareg requested that the pump be turned off (Bernus, 1974 *In:* Smith, 1992).

In Botswana, deep boreholes dating back to colonial times in the 1930s opened up vast areas of the country previously unavailable to livestock except during the rainy season. Permanent access to grazing lands increased from 20% in 1936 to 45% in 1986, while the cattle herd increased from 1.2 million in 1934 to 3 million by 1998.

“Since the boreholes were mostly owned by individuals or syndicates, the grazing around them began to be seen as belonging to the borehole owners, thus laying the seeds for the privatization of communal grazing land in the years to come” (Cullis & Watson, 2005).

In Botswana, the de facto privatization of water sources and rangelands, through the Tribal Grazing and Land Policy of 1975, was aimed at the commercialization of extensive livestock keeping through private ranches. This was based on the conviction that fenced ranching is more productive than communal rangeland development (Bruce, Freudenberger & Ngaido, 1995; Lane & Moorehead, 1995; Le Roy, Karsenty & Bertrand, 1996 all *In:* McCarthy, *et al.*, 1997). Boreholes close to cattle posts have reduced the seasonal movement to traditional rainy season grazing areas, with the result that there is severe local over-grazing and degradation close to population centers. Privately dug wells and boreholes upset

Tswana traditions where water was to be made freely available to whoever needed it, allowing private ownership of the water and de facto ownership of the grazing land around the water supply (Hitchcock, 2003). Boreholes mainly went to wealthy livestock keepers, the associated pastures being regarded as private land.

“The largest part of the remaining area stayed communal land. The distributive consequences of planned fencing should have been predictable: the establishment of private property for more wealthy borehole and livestock owners, and the deprivation of the poorer segment and a neglect of minority rights” (Kirk, 2000 *In: McCarthy, et al.*, 1997, Excerpted with permission from the International Food Policy Research Institute) (see Chapter 3, Section 3.4.2.3, The legal exclusion of the African hunter from his wildlife, Loss Of Hunting And Territorial Rights By “San” Bushmen, Botswana).

Drilling of public boreholes in drier areas of rural Botswana (e.g., the Kalahari) facilitated expansion in the number of livestock that could be kept year-round in what had been rainy season grazing areas. The rising numbers of livestock and the reduction of their mobility contributed to a process of over-grazing and environmental degradation. Consequently, both chiefs and the Protectorate administration began to call for the privatization of land in order to counteract what they saw as problems of communal land and water access. A major problem in the livestock sector of Botswana is that although land use planning efforts are expanding both in number and sophistication, the ad hoc drilling of boreholes continues without any real controls being implemented to ensure better range management. Efforts are now being made to coordinate activities between the Department of Water Affairs, the Department of Geological Survey and the Water Utilities Corporation (Hitchcock, 2003).

In attempting to quantify the impacts of cattle around boreholes in the Kalahari¹¹⁰, Perkins and Thomas (1993) and Perkins (1996) describe the zonation of the piosphere with distance from the borehole as:

- 0-50 meters, considerable nutrient enrichment from Extreme Herbivore Use Intensity (HUI).
- 0-400 meters, Sacrifice Zone, vegetation destroyed, surface disruption by wind erosion.
- 200-800 meters, Nutritious Grass Zone, negligible soil changes, dominance of palatable nutritious grasses.
- 200-2,000 meters, Bush Encroachment Zone.
- >2,000 meters, Grazing Reserve of climax unpalatable tufted perennial grasses.

Thus, Perkins and Thomas (1993) and Perkins (1996) state that in the Kalahari, impacts on the natural environment do not exceed a 2 km radius from the borehole. Bush encroachment is believed to occur in over-grazed areas from reduced competition by grasses, increasing the availability of water to woody species. Species such as *Acacia spp.* are favored because of their shallow roots that are able to pick up irregular and sporadic rain that wets only the surface soil. In addition, in the nutrient poor savanna soils, *Rhizobium spp.* bacteria are able to form symbiotic nodules on the roots of the *Acacia* that can fix atmospheric nitrogen, making it available for use by the *Acacia* (Skarpe, 1990). Perkins (1996) explains that the bush encroached zone can probably revert back to open savanna via fire effects in the long-term. However, the bush encroached zone can also expand outward with time, depending on stocking rates and borehole density (Perkins & Thomas, 1993). Perkins (1996) and Perkins and Thomas (1993) argue

¹¹⁰ 75% of Botswana is occupied by the Kalahari Desert sandveld with about 400-500 mm of rainfall/year (Perkins & Thomas, 1993), whereas the Sahel ranges between 200-400 mm of rainfall/year (see Chapter 1, Figure 1.3).

that the browse from bush encroachment serves as food for goats during normal times and as a food reserve for cattle during drought periods, helps prevent wind erosion and in its shade provides a seed bank of grasses along with the grazing reserve to recolonize the area once rains return. Periodic droughts, heat stress and physiological limitations result in cattle being unable to graze extensively in the unpalatable grazing reserve and make it impossible to maintain high stocking rates on drought-depleted rangelands for long-periods of time. This helps to maintain the integrity of the grazing reserve. Thus, water from boreholes during the dry season/droughts and rainfall during normal times remain the key limiting factors controlling grazing availability and livestock production (Perkins & Thomas, 1993; Perkins, 1996). This seems to contradict observations by Rosenblum and Williamson (1990) around boreholes in the Kalahari of Botswana, where it is claimed that one borehole can destroy a circular piosphere of 777 km² (300 square miles), a radius of about 15.7 kilometers, resulting in human-made desertification. There really is no contradiction, with rainfall and humans, as is discussed below, being the determining factors as to the ecological response to over-grazing. The density of boreholes that may eliminate rainy season grazing reserves by connecting piospheres may be one of the major culprits in range degradation.

For comparison, in Australia, it is estimated that cattle can walk 20 km a day, but most grazing occurs within a 10 km radius of the piosphere. Sheep that dominate southern rangelands may walk up to 10 km a day, but the majority of the grazing is within 5 km of the piosphere (Landsberg, *et al.*, 1997). In southern rangelands under hot conditions, foraging by sheep may be reduced to 3 km (James, Landsberg & Morton, 1999). Half of the grazing pressure in the southern rangelands of Australia (northern New South Wales and southern Queensland) comes from kangaroos and goats that may walk a minimum of 20 km/day. The main feral animals of northern Australia, horses, donkeys and camels, can walk at

least 20 km/day (Landsberg, *et al.*, 1997). Camels can go for periods of four days in summer to 89 days in winter without drinking (James, *et al.*, 1999). Thus, 10 km is considered an average piosphere well within the range of these animals (Landsberg, *et al.*, 1997). Zonation similar to the Kalahari studies was observed; shrub cover was low in the sacrifice zone within 400 m of the water point, increased rapidly around 1 km and reached a stable maximum percentage cover 2–3 km from water.

“Within 2 km of artificial water some generalizations are apparent. When heavy grazing removes competition from palatable species, or those sensitive to trampling damage, ‘increaser’ species¹¹¹ establish. These are typically species with ‘annual’ life histories that flourish after rain, or unpalatable perennial shrubs” (Landsberg, *et al.*, 1997).

“There is also evidence that in some areas under-grazing of remote pastures, as a result of sedentarization, is a more serious problem than over-grazing” (Galaty, 1988; Warren & Rajasekaran, 1993 both *In: Niamir-Fuller, 2000 In: McCarthy, et al, 2000, Excerpted with permission from the International Food Policy Research Institute*).

“For example, piosphere (vegetal zones related to watering points) studies around agropastoral villages in northeastern Senegal show that undergrazing of distant pastures results in lower palatability of primary productivity, lower phosphorus content of topsoil, lower herbaceous density, and lower biomass production” (Niamir, 1987 *In: Niamir-Fuller, 2000 In: McCarthy, et al, 2000, Excerpted with permission from the International Food Policy Research Institute*).

“Thus the new range ecology postulates that, for grazing to have little or no negative impact on arid rangelands, it must follow or ‘track’ climatic variability” (Niamir-Fuller, 2000 *In: McCarthy, et al, 2000, Excerpted with permission from*

¹¹¹ “Increaser” species are indicators of over-grazing and take over as the dominant species from more palatable “decreaser” species that are selectively preferred by grazers and reduced/eliminated (see Section 6.1.4.5, Impacts of boreholes, over-grazing and over-use of fire on palatable grasses).

the International Food Policy Research Institute), that is imitate traditional wet/dry season transhumance movement of livestock that maximizes utilization of rangelands on the subcontinent.

The placement of boreholes and watering points in rainy season grazing areas continued into the mid-1980s, even in Heuning Vlei, Northwest Province of sophisticated South Africa (Undisclosed Source, *pers. comm.*), with good intentions, but in complete ignorance about the likely outcome: over-grazing, bush encroachment and trampling. Likewise, in Namibia, during the 1992-93 drought, the government drilled 100s of boreholes and provided fodder to protect herders' assets (livestock) even though ecologists were concerned that these artificially preserved large herds would cause accelerated degradation around water points (Moorehead & Wolmer, 2001 *In:* Devereux & Maxwell, 2001).

With regards to wildlife, Senzota and Mtahko (1990) state that in the Mikumi National Park, Tanzania, the impacts of browsers on grass cover were significant only within 100 meters of a dam, with 80% of the zebra and 90% of the wildebeest spending less than three minutes there, most likely because waterholes tend to be sites of predation.

Why the variation in observations as to the impacts from boreholes on vegetation?
There are a number of possible explanations:

Rainfall

Jeltsch, Milton, Dean and van Rooyen (1997) argue that the classic piosphere description as given for the Kalahari and Australia did not occur in low rainfall events, with the increase in shrub cover (bush encroachment) being limited. This lack of bush encroachment has been noted by Hanan, *et al.* (1991 *In:* Jeltsch, *et*

al., 1997) in the Sahel and van Rooyen, Bredenkamp, Theron, Bothma and le Riche (1994 *In:* Jeltsch, *et al.*, 1997) in the Kalahari Gemsbok National Park. Jeltsch, *et al.* (1997) state that under a higher rainfall scenario, regardless of stocking rate, the classically described piosphere developed with bush encroachment. Jeltsch, *et al.* (1997) have found highly resilient shrub encroachment in higher rainfall areas in piosphere zones with virtually no recovery over a 100 year period, which was modeled. It is assumed that this is without humans in the equation (see Section 6.1.4.4, Bush encroachment versus desertification). Under the low rainfall scenario, the higher formation of bare soil causes soil erosion, which eventually is more permanent and less reversible than shrub encroachment (Jeltsch, *et al.*, 1997). In South Africa, Ward (2005) also found that “rainfall amount and frequency, coupled with specific soil nutrient levels, may drive this phenomenon” bush encroachment as much, or more so than over-grazing and fire.

In Southern Australia, and it is assumed that this would hold for the low rainfall areas of Sub-Saharan Africa,

“soils in arid environments worldwide are generally nitrogen and phosphorous deficient, and soils in arid Australia are generally more deficient than those in other countries. Most nitrogen available to plants is held in the top 10 cm of soil as a result of breakdown of organic matter (Charley & Cowling, 1968 *In:* Landesberg, *et al.*, 1997) and nitrogen-fixing algae in cryptogamic crusts (Mayland & MacIntosh, 1966 *In:* Landesberg, *et al.*, 1997), but see Snyder and Wullstein (1973 *In:* Landesberg, *et al.*, 1997) for an alternative view on the role of cryptogamic crusts in providing nitrogen.

Heavy traffic by stock breaks up the cryptogamic crust (Eldridge, 1996 *In:* Landesberg, *et al.*, 1997) which has two consequences: 1) the nitrogen-fixing action of the cryptogams is disrupted; and 2) the soil surface is loosened allowing wind and water erosion to remove surface layers. Charley and Cowling (1968 *In:* Landesberg, *et al.*, 1997) suggested that removal of this vital surface layer

prevented regeneration of degraded chenopod shrublands in southern Australia (Landesberg, *et al.*, 1997)".

This same phenomenon occurring in Sub-Saharan Africa in low rainfall (e.g., under 400 mm/year) areas without the mitigative effects of bush encroachment would ultimately result in desertification such as with the Harmattan winds of the Sahel blowing away the top soils of over-grazed rangelands, resulting in increased desertification with little or reduced vegetational cover of low palatability during the rainy season.

Distance between Boreholes/Borehole Density

A major factor impacting vegetation is the distance between watering points. In Western Australia, the average distance between boreholes/water was 7 km and 11.2 km for sheep and cattle lands, respectively. The average spacing of water points in mulga (*Acacia aneura*) woodland habitats of northern New South Wales and eastern South Australia was 5.5 km on sheep properties and 11.0 km on cattle properties. In a similar biome in southwest Queensland, the average distance between watering points was 5 km. For cattle in central Australia, mesic periods (moderately moist) when forage is of high quality result in cattle movements of only 4 km from water (Hodder & Low, 1978 *In: James, et al.*, 1999). Under dry conditions, when feed is sparse or of poor quality, movements up to 10 km result (Hodder & Low, 1978 *In: James, et al.*, 1999), and in very poor quality habitat, or during winter, cattle may occasionally move over 20 km from water (James, *et al.*, 1999). Thus, if watering holes are too close, livestock can graze between piospheres, extending the zones of bush encroachment or desertification depending on the rainfall levels.

In the Kruger National Park, South Africa, Thrash, Nel, Theron and Bothma (1991a; 1991b *In: James, et al.*, 1999) and Thrash (1998 *In: James, et al.*, 1999)

state that while the measurable effects of grazing around artificial water points were only evident for a few kilometers, there was loss of habitat diversity at greater distances due to the increased density of water points, hence the increase in the amount of area that is available to grazing animals during the dry season. Thus, if piospheres overlap, the potential exists to have massive areas of degradation. As already noted above, overlapping piospheres from too closely placed boreholes can result in massive degradation (Section 6.1.4.3, Impacts on pastoralism and range ecology from boreholes).

Harvest of Bush for Firewood and Charcoal

Humans co-evolved with the mega-fauna and savannas of Africa and play an important role in their maintenance. The elimination of humans from this equation by a Western-driven conservation movement fails to understand and/or ignores their role in the biome. Seeing humans as the problem rather than part of the solution to the management of savanna ecosystems is a major cause of the problems, which are discussed below in Section 6.1.4.4, Bush encroachment versus desertification.

Fire

Throughout the Sahel and West Africa, the savannas are burned annually. As is discussed below in Section 6.1.4.4, Bush encroachment versus desertification, there is a general tendency in East and Southern Africa not to burn and to even discourage burning. This no-burn policy appears to be a remnant of British colonial policies applying inappropriate Eurocentric temperate climate ecological principles to African savannas. The United States, that had an inappropriate “Smokey The Bear” don’t burn policy in the 1950-1970s, today, with better understanding of ecology, is changing to controlled and even natural burning

(Hess, 1993), especially in the arid and semi-arid West. Similarly, African savanna ecologists are just beginning to understand the functioning of these ecosystems for which humans and fire play a dynamic role in the maintenance of savannas. Fire suppression results in bush encroachment, while in areas with annual burning this will tend to hold back the bush. According to Funston and Brits (*pers. comm.*), the organic load in the Kalahari is too low and burning rarely takes place, so that fire is not part of the equation in this system. Bush encroachment will likely occur in higher rainfall areas with little or no fire and low population densities, while desertification will likely occur in lower rainfall areas.

On the Borana Plateau of southern Ethiopia, “the ban on bush fires imposed by the national government in the 1970s led to a dramatic increase in bush encroachment and subsequent loss of grazing areas” (Swallow & Kamara *In:* McCarthy, *et al.*, 2000).

Concerning the ban on burning in the Ngorongoro Crater, “the ban on burning promoted the observed ecological changes in the Crater’s that favor buffalo over wildebeest and Thomson’s gazelle, black-backed over golden jackals and so on. No other factors considered during the present study appear of equal importance” (Estes, Atwood & Estes, 2006).

Animal Densities

The amount and intensity of grazing will determine the degree of degradation around watering points. Wildlife that co-evolves with humans in African savannas tends to self-regulate, unless artificially stocked like livestock as on Southern African game ranches. A combination of no-burn policies, human and livestock population explosions in the 20th century, and compression from land expropriation for cultivation, parks and protected areas, spacing of boreholes and artificial subsidies, such as those coming from the Lomé Convention, increased

the concentration of livestock across Sub-Saharan Africa. This has resulted in over-utilization and degradation of Africa's savannas, be it bush encroachment and/or desertification.

6.1.4.4 Bush encroachment versus desertification

Why does over-grazing tend to result in desertification in much of West Africa, while in the fenced parks and game ranches of South Africa we see so much bush encroachment? The principal author never observed obvious bush encroachment in West Africa. The bush came back to some degree around fallow fields, though with reduced fallow, there was less and less secondary bush, and on the Ranch du Doli, a cattle ranch in Senegal, where cattle numbers were carefully controlled, and man's involvement was minimized – especially for charcoal and firewood production. In the 1980s, this ranch stood out on satellite and aerial photos on an otherwise barren landscape.

Blankenship, Parker and Qvortrup (1990) note that around Lake Elimenteita, prior to European colonization, "Maasai periodically burned the plains and perhaps kept the bush from further encroachment into the grasslands". In fact, conservationists are just beginning to realize that without the Maasai and their cattle, the Serengeti grassland ecosystem is suffering from bush encroachment (Colchester, 2003). Kjekshus (1977) notes that burning and the woodman's ax pushed back the bush in Tanzania (see Chapter 2, Section 2.1.2, Controlling Wildlife Distribution by Habitat Management) that was reclaimed as the result of a catastrophic series of events in the 1890s, which drastically reduced both human and livestock populations (Chapter 3, Section 3.1.8.1, Ecology of an empire in Tanganyika and Kenya) as nature temporarily won out. Along with the return of the bush came the tsetse fly and sleeping sickness (see Chapter 3, Section 3.1.8.1, Ecology of an empire in Tanganyika and Kenya).

The British colonial policy in East Africa discouraged burning (Kjekshus, 1977). In Kenya, with the coming of the European settlers, fire was “better controlled” and with the help of grazing from livestock, bush (woody component) became more predominant in much of the area (Blankenship, Parker & Qvortrup 1990).

The first time bush encroachment from over-grazing was pointed out to the principal author was around Lake Mburo National Park, Uganda, where during the dry season up to 80,000 cattle graze within the park (see Chapter 11, Section 11.11.2, Donor driven conservation, Lake Mburo National Park (LMNP), Uganda).

Meanwhile, in the Limpopo and Northern Provinces on game ranches and even in the Kruger National Park, bush encroachment is a major problem. Yet, historical accounts by early explorers and hunters indicate that much of northern South Africa and neighboring Namibia, both suffering major bush encroachment on their farms, were open savanna 100 or more years ago. Even in Kruger, the (what some consider too) many elephants (11,000 in 2004), known for their propensity for creating savanna, cannot seem to hold the bush back. According to Kruger Veterinarian, Roy Bengis (*pers. comm.*), a problem with the idea of elephant holding back the bush is that they are selective feeders and thus cannot serve to completely hold back the bush on their own. It is mainly the bulls that push down the biggest trees (Thomson, 2003; Bengis, *pers. comm.*) and ring-bark trunks, especially bull herds (Thomson, 2003), which results in the death of trees. Once one bull starts breaking down a tree, it stimulates other bulls to do the same. Thomson (2003) believes that this phenomenon is especially true in larger bull herds, where demonstrating strength helps to reinforce position in the hierarchy. Cows and juveniles feed mainly on tree seedlings, the under-story plants in woodlands or on ground plants in open scrublands. Bulls also feed on this vegetation, but spend an inordinate time on larger trees. Thus, there is more

habitat damage by bulls than breeding herds since bulls damage older trees that take longer to replace (Thomson, 2003). However, over-populations of elephants can have major impacts on vegetation, impacting both habitat and biodiversity (see Chapter 3, Section 3.9.1, Eco-Genocide and the Elephant People and Chapter 10, Section 10.4.5, Does CITES Help Southern African Elephant Conservation? and Section 10.4.5.1, Hwange National Park, Zimbabwe) (Figure 6.1). This is especially true where increasing elephant populations, because of human and/or physical fences, cannot easily disperse. Ultimately, whether this is considered positive or negative depends on management objectives.

It appears that two of the major differences between Southern Africa and West Africa may very well have to do with the exclusion of humans from the system with annual fires, chopping down the bush as fodder for livestock that browse once the grasses are consumed, and the intense harvesting of the bush for charcoal and firewood. Fire in West Africa is undertaken for a variety of reasons: 1) *feu précoce*, precautionary fires early in the dry season to protect villages from burning down as a result of uncontrolled wild fires, and which open the village up visually so that predators can be easily observed, 2) burning about two months into the dry season to obtain a second flush of grass for livestock and wildlife, though this often takes place too late into the dry season, resulting in hot fires that kill the growing part of the trees/shrubs the crowns, which results in the death of this vegetation, 3) opening up the bush for better visibility by hunters and 4) tsetse fly control. Some range and pasture management experts argue that if productivity is the main objective, burning at this time is not prudent since it uses up vital nutrients normally stored in the root system of perennial grasses until the next rainy season. It is suggested that burning take place just before or just after the first rains, while the grass is still dormant (Krynauw, *pers. comm.*). Nevertheless, in East Africa where suppression of fires has been encouraged by well meaning but misinformed resource managers,

“the Maasai regularly burn high-rainfall areas in the (Ngorongoro) Crater Highlands, for the stated reasons of controlling tick-borne diseases and providing pasture with a high nutritional value. ‘This strategy would appear to be successful, as the incidence of ticks was very low in the rangelands utilized by domestic livestock outside the Crater. In comparison to extensive areas of the Crater dominated by *Chloris gayana* (Rhodes grass) the grasslands (in Maasai area) were generally not overgrown and moribund’ ” (Trollope & Trollope, 2001 *In: Estes, et al.*, 2006).

Maasai burn just before the first short rains in October (Mbarnoti, *pers. comm.*).¹¹²

The principal author vividly remembers what appeared to be manicured mango trees in villages all over West Africa. Where once grass was consumed, cattle began eating leaves as a means of survival. By cutting down the bush under such conditions, humans can feed their livestock, obtain firewood for their home and obtain cash income from selling charcoal to the cities. West African goats become arboreal during the dry season, spending much of their days in trees feeding on leaves and seedpods that cannot be reached from the ground.

Bell (1971 *In: Smith* 1992) states that both fire and pastoralism permitted the expansion of the grazing conditions from edaphic grasslands into higher rainfall and higher productivity areas where trees originally predominated. In the highlands of Cameroon (e.g., Bamileké Plateau and Adamoua Plateau), grass fields had largely replaced forests 2,000 to 3,000 years ago (1,000 BC to 0 A.D.), one of the reasons for the Bantu migrations (Chapter 1, Section 1.7, BANTU AFRICA) (Vande weghe, 2004). In over-populated Rwanda and Burundi, as farmers cleared forests, farmed and then abandoned this land for freshly cleared land from virgin forests further up the mountain, pastoralists kept forests from

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returning by maintaining permanent grassland, where grassland had not naturally existed in the past (Vande weghe, 2004). Likewise, Smith (1992) suggests that as agriculturists cleared the bush, pushing back the tsetse fly, war-like pastoralists may have displaced these agro-pastoralists/agriculturalists, thereby continually pushing the Bantu iron-using people southward through East and Southern Africa (Chapter 1, Section 1.7, BANTU AFRICA), where they eventually arrived at the Fish River, East Cape Province, South Africa. They were, however, stopped from advancing due to having only summer-rainfall crops in a winter- rainfall environment (see Chapter 1, Section, 1.1, PRE-HISTORIC AFRICA – THE CRADLE OF MANKIND).

Thus, humans and livestock help maintain grasslands and develop grasslands or savannas dominated by grasses where they did not traditionally occur. On the other hand, without continued maintenance, much grassland/savanna would revert to closed canopy woodland with concomitant tsetse fly infestation (Smith, 1992), as is discussed in Chapter 2, Section 2.1.2, Controlling Wildlife Distribution by Habitat Management and Chapter 3, Section 3.1.8.1, Ecology of an empire in Tanganyika and Kenya; thus, taking away humans and livestock results in bush encroachment. It also appears, as on South African farms, that over-stocked cattle alone cannot hold back the bush and in fact cause bush encroachment by eliminating the build-up of biomass from over-grazing, which can result in hot burns that kill the bush. The grazing of cattle, in combination with humans and their management of the bush through regular burning and the harvest of the woody component for firewood and charcoal can result in the opposite impact if taken to the extreme, namely desertification, especially in low rainfall areas.

Dr. Paul Funston (*pers. comm.*), a lion researcher at Tshwane University of Technology's (TUT) Department of Nature Conservation, gave a very well received but controversial presentation at a workshop in the Kruger National Park.

He explained that bush encroachment in the northern part of the Kruger National Park, in addition to other factors, which are discussed below, impacted the viability of roan and sable populations among others. He argued that many areas, in which he had been conducting research, were closing up and that unless humans and/or the simulation of human activities were reintegrated back into the management of the park; there would be a major loss of habitat in the future (Figure 6.2).

At the April 2004 Wild-Expo Game Ranching Symposium in Pretoria, South Africa, Jordaan (*pers. comm.*) concluded that bush encroachment on game ranches in South Africa is a major problem, resulting from over-grazing by livestock when many of these farms used to be cattle farms combined with a no burn policy. Today, there is not enough grass in much of South Africa's bush encroached Limpopo and Northern Provinces to sustain viable livestock populations. This is a major reason, in addition to economics, why many ranches are being converted to wildlife, which make more diverse use of the vegetation, including browsing. An additional constraint is that many game ranches are too small to be well managed or economically viable. The average game ranch in the Limpopo Province is about 800 ha (Botha, *pers. comm.*). In many cases, these farms are over-stocked and if a portion of the farm is burned, the resulting new flush of grass is over-utilized by the grazing game, which causes habitat degradation. There is also a reluctance to use fire as a management tool on small farms for fear of the fire spreading to adjacent farms, resulting in a de facto no-burn policy. Also, on small farms used for tourism, burns appear unsightly to the tourists and are thus not favored as a management tool. Jordaan (*pers. comm.*) is concerned that unless fire is reintroduced, in essence recreating both humans and nature, and bush encroachment is controlled on these game ranches, the future for wildlife on many of South Africa's bushveld game ranches may be bleak, as carrying capacity may be significantly reduced.

Thus, the currently experienced problems in management of Southern Africa's savannas may arise in the exclusion of humans in low densities. The historical presence of humans in savannas has had a co-evolutionary effect on the ultimate nature and content of savannas in the pre-conceived "parkland" landscape, viewed as the ideal by current wildlife managers.

In free-ranging, low rainfall, over-populated areas of Southern Africa, one can observe similar conditions to the Sahel. Figures 6.3 and 5.10 were taken by the principal author in the winter (August) of 2003, in Mozambique, along the road from Tete to the Chimoio Highway leading into Zimbabwe (see Chapter 5, Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal linked to charcoal making, over-population and declining fallow periods). This looked just like the Sahel, over-grazed bare ground with open bush. It is obvious that fire, over-grazing and harvesting of the bush have minimized the impacts of bush encroachment observed on South Africa's fenced game ranches and parks. In the foreground of Figure 5.10, charcoal is for sale. Similar to the Sahel, these areas in Mozambique have very low rainfall, which likely contributes to the "behavior of the bush" from overuse by humans. According to de Haan, *et al.* (1997), in the case of the Borana region of southern Ethiopia, but true for much of Sub-Saharan Africa

"the larger number of people in the region means that fuelwood is being cut at an ever greater rate. The inevitable result of all these pressures is land degradation. Drought often exacerbates such situations and, indeed, the ability to recover after drought is one of the main indicators of long-term environmental and social sustainability of arid grazing systems".

Humans are the difference and the future may very well be how to integrate, not exclude, them and their traditional use of Africa's natural resources in a manner that results in a positive benefit to both humans and nature.

Interestingly enough, on the Lord Delemere Estate in Kenya (personal observation in the early 1990s) and on the Kekopey Ranch where one of the first FAO/UNDP game cropping studies was undertaken in the late 1960s (Blankenship, *et al.*, 1990), bush encroachment was controlled by bringing in local communities to clear the bush in order to make charcoal. This was a win-win relationship with the ranches getting their bush cleared for free and the local people making money from charcoal. On the Kekopey Ranch, at the time, about 21% of the bush had been converted back to grasslands using this method that was also instrumental in improving range and pasture conditions for both wild and domestic ungulates (Blankenship, *et al.*, 1990). Modern range managers must learn to apply techniques used by Africans for centuries, but which until recently and even today were/are believed to be harmful to maintenance of the savannas. Whether they are beneficial or harmful will depend on how, how often, when and where such traditional management techniques are applied, as modern Africans are required to more intensively manage decreasing per capita resources, in this case the savannas needed to maintain wildlife, livestock and humans.

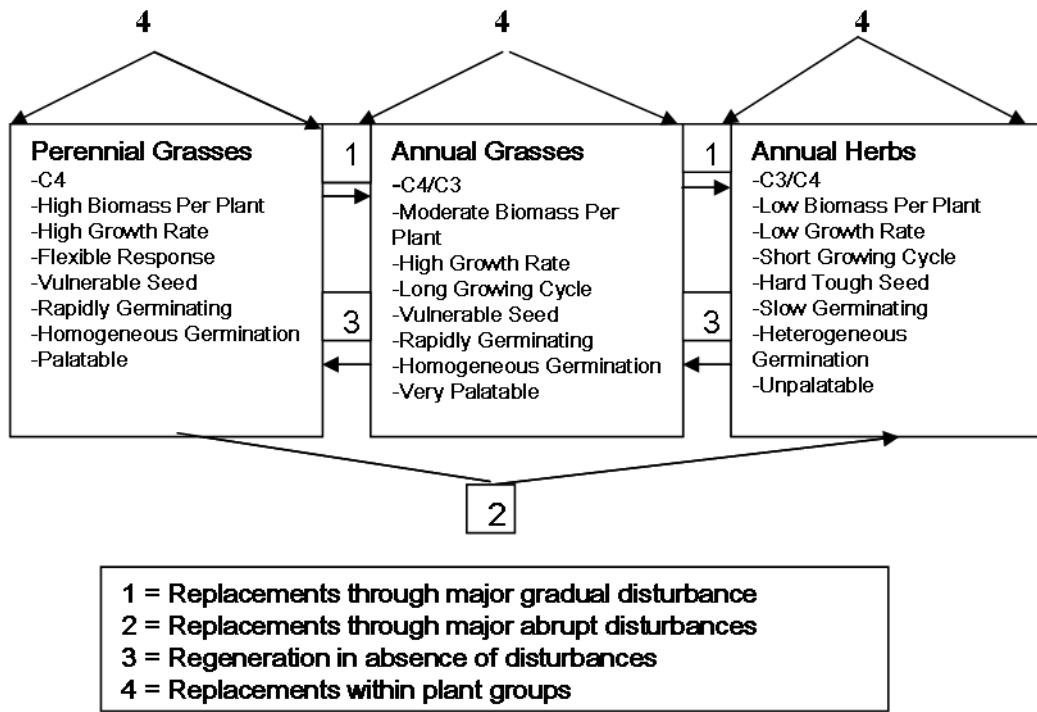
A key conclusion that must be drawn here is that the maintenance of savanna is anthropogenic (human-induced) through fire, harvesting of wood and in combination with grazing of livestock, while wildlife, especially elephant, to some degree play a role in opening up forests. There has always been a delicate balance between humans and savannas dominated by grasses versus dominated by forests (bush component). Take humans out of the equation (e.g., no fire, no harvesting of charcoal and firewood) while maintaining and/or eliminating livestock, and bush encroachment occurs, as on Southern African fenced ranches,

and in the Kruger National Park, among other places. Change humans' traditional nomadism, by, for example, introducing boreholes so that they become sedentary or through the over-population of the 20th century where itinerant farmers, as fallow land disappears, moved into traditional nomadic grazing areas, and savannas are turned into deserts in low-rainfall areas as in the Sahel or portions of Botswana, or bush encroaches in higher rainfall zones. In both cases, the savanna is degraded by modifying the manner in which humans traditionally managed this environment.

6.1.4.5 Impacts of boreholes, over-grazing and over-use of fire on palatable grasses

The structure, species composition and quality of vegetation are related to the rainfall quantity and distribution, as well as soil fertility (see Chapter 5, Section 5.5.2.3, Nutrients, pH, acidity and carrying capacity). Over-grazing by livestock of sedentary herders, combined with heavy burning well into the dry season to try for a second flush of grass, favors poorer quality annual grasses - increasers (Hardin, 1977; Owen-Smith & Danckwerts, 1997 *In: Cowling, et al., 1997*) (e.g., as opposed to perennials. Over-grazing is the result of selective feeding by livestock on the more palatable and nutritious grasses (decreasers), often perennial grasses, resulting in less desirable grasses (often annuals) dominating, and eventually bush encroachment (Figure 6.4). Other adverse consequences of over-grazing are a reduction in carrying capacity for livestock and eventually the land becoming barren. This is especially true during the dry season or droughts, the land becoming subject to severe soil erosion, both from wind and rain. With the vegetation removed and the soil pulverized by the cattle's hooves, the earth is eroded by the wind and the finer particles (silt) collect and are washed by rains to the bottom of slopes where they dry out into an impermeable cement (Hardin, 1977), reducing the land's ability to retain moisture. When it does rain, the

chances of the range recovering are correspondingly reduced (Nana-Sinkam, 1995).



Source: Redrawn from Breman, Cissé and Djitéye, 1982; Rietkerk 1998 both (*In: Lycklama à Nijeholt, et al.*, 2001) with permission, World Wide Fund for Nature (WWF).

Figure 6.4: Dynamics of herbaceous savanna vegetation in response to disturbances

This degradation, associated with boreholes and over-grazing, has permanently impaired the rangeland's potential for recovery and decreased its carrying capacity (Nana-Sinkam, 1995) across much of Sub-Saharan Africa. Over-grazing also favors the increase in invertebrates such as locusts, often resulting in outbreaks of these populations (especially after a few drought years when rains return), as well as certain rodents and hares (de Vos, 1975).

Unfortunately, the above mistakes continue. Well-known South African sport hunter and businessman, Peter Flack noted in a 2003 hunt to Chad that

“the German development company Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), in yet another well-meaning, unscientifically-researched project, has, once again, used European tax payers’ money to implement a program which devastated the local environment. They have dug dams and drilled a series of boreholes down the eastern side of Chad. This has attracted nomads from far and wide, including Sudan, and has meant that they no longer move on at 3-5 day intervals, but camp around the wells and dams until the water runs out. They have destroyed the vegetation for kilometers around the water points and, in particular, cut down all the dry forest trees, particularly the *Acacia senegalensis*, to feed their herds when the grazing runs out. I saw 1000s of trees felled by nomads. Reduced rainfall and desertification follows this destruction. In addition, it has brought the nomads into conflict with the local people. On one occasion when the nomads loosed their flocks and herds among the ripening crops of the Dadjo people of Dar-Silla, a month before our arrival, over 140 people were killed by gunfire, spear and poisoned arrow, some 40 km from the village. In words of the famous protest song – ‘When will they ever learn, when will they ever learn’! The end result was vast areas of flat, dusty dung-filled, fly-ridden plains, tiny blackened hamlets of conical shaped thatched huts, and domestic livestock everywhere” (Flack, 2003) that pushed out and displaced wildlife.

6.1.4.6 Impacts on pastoralism and range ecology from sedentarization and privatization policies

Spontaneous sedentarization has been driven by a combination of factors that interact and reinforce each other (Niamir-Fuller, 2000 *In: McCarthy, et al., 2000*):

- Major droughts;
- Differential government support of agriculture;
- Lack of government support for transhumance;
- The “benign neglect” syndrome of pastoralism (Swift, 1993 *In: Niamir-Fuller, 2000 In: McCarthy, et al., 2000*);
- Population- and policy-driven extension of cultivation into rangelands;

- Increased competition and conflicts over land, both between pastoral groups and between pastoralists and itinerant farmers;
- Increased individualization and disruption of political structures within pastoral societies;
- Central government claims to “vacant” pastoral land (government-owned farms and national parks);
- Increased ownership by investors outside of the pastoral sector; privatization; and
- Growing economic vulnerability of transhumant groups.

“The major droughts of the 1970s and 1980s forced a mass movement of herders in the Sahel toward the south, with most converting into agro-pastoralists and some completely settling, but it is not known how many have been able to return to their previous transhumance system since then” (Niamir-Fuller, 2000 *In: McCarthy, et al.*, 2000). According to Thébaud (1998 *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000), “if after 10 years a sedentarized household has not been able to amass enough capital to reinvest in livestock, it will probably never be able to return to transhumance” (Excerpted with permission from the International Food Policy Research Institute).

Nomadic pastoralists are even induced by governments into becoming sedentary to be more easily controlled by the state (Morris, 1995; GEF, 1998; Moore, Kabore, Gnoumou & Bertelsen, 1999). The independence of the Tuareg in Niger, Mali, Upper Volta and the nomadic Maasai in Kenya and Tanzania frighten their respective governments, who would prefer to see them sedentary and hence politically under government control. Consequently, to keep them in place, there are permanent pumping stations in the Sahel and the “ranches” of East Africa, destroying irreplaceable elements of the human and vegetational mosaic and creating new human-made deserts, all in the name of progress (van Voorthuizen, 1978). Other reasons given for sedentarization of nomads are (Moore, *et al.*, 1999; Adams, 2003 *In: Adams & Mulligan, 2003*):

- Nomads are seen as an ecological and an economic liability;
- The sedentarization of nomads improves both tax collection and use of infrastructure (marketing channels, veterinary posts, water points) (Likewise, Smith (1992) concludes that sedentarization policies allow governments to more easily tax pastoralists.);
- Nomadic pastoralists are seen as wasteful, unproductive, self-destructive and incompatible with modern agriculture;
- The pastoral way of life is viewed as conflicting or as incompatible with the standard of civilized behavior, manners and values; and
- The meat supply shortage in the coastal countries of West Africa was seen as the justification for improvement of livestock policies through sedentarization.

The net result in the Sahel and elsewhere has been environmental degradation (e.g., over-grazing) and conflicts between pastoralists and farmers (Moore, *et al.*, 1999; Niamir-Fuller, 2000 *In: McCarthy, et al.*, 2000; Adams, 2003 *In: Adams & Mulligan*, 2003). Sedentarization policies have failed on both economic and ecological grounds (Sandford, 1983; Homewood & Rogers, 1987; de Haan, 1994 all *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000). Whether forced or spontaneous, these policies have resulted in severe land degradation in semi-arid areas of Sub-Saharan Africa, including reduced vegetation diversity, soil degradation and invasive less palatable grasses in distant pastures from reduced grazing pressure (Niamir-Fuller, 2000 *In: McCarthy, et al.*, 2000). Settlement also results in a loss of traditional knowledge about and controls on range use, leading to less efficient management of the arid resources (Jacobs, 1980; Farah, 1993 both *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000).

“Sedentarization does have positive results—such as providing access to local authorities, education, and health—but the benefits are not as evident for all. Only those elites with means can escape the negative impacts of sedentarization. Customary sociopolitical systems have been subsumed under the hegemony of the central state (nation), leading to a weakening of the traditional leadership, and a fragmentation of authority. The customary judicial system has been relegated to deal with relatively minor internal conflicts. Communally held land (the ownership of which was generally vested in a deity) has been abrogated by the nation-state, often under the pretense that they are not being put to productive use, resulting in a breakdown of common-property regimes” (Niamir-Fuller, 2000 *In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

“The continuing decline in living standards among most mobile pastoralists is manifested by the high rate of out migration toward smaller towns and cities” (Ole Kuney & Lendiy, 1994 *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000) or towards large-scale sedentarization, as in Tunisia (Bedrani, 1987 *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000) or as in Southern Maasailand increasing sedentarization (see Chapter 9, Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”).

In Sub-Saharan Africa, a “trend since the 1970s is the increasing concentration of wealth in the hands of a few. It is common to find that about 15% of the population controls 80% of the livestock” (Little, 1985; Sutter, 1987; Ndagala 1991 all *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000) (see Chapter 11, Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana). “Increasingly, the large owners are investors from outside the traditional transhumant sector, who entrust livestock to mobile families or hire herders for a wage” (Little, 1985; Turner, 1992; Bassett, 1994 all *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000).

“Often these new owners, to maintain oversight of their wealth, place limits on the mobility of the herd. The gradual disintegration of customary institutions responsible for managing natural resources has provided the opportunity for proponents of privatization to push through their particular agenda of land reform, resulting in widespread alienation of land (Niamir-Fuller, 2000 *In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute)”.

Evidence can be cited from Uganda, in Bazaar (1994 *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000); Kenya, in Fratkin (1994 *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000) (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya); and Namibia, in Cox, Kerven, Werner and Behnke (1998 *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000). “The rate of land expropriation is so severe now that it has been labeled a ‘land crisis’. Many pastoral advocates and organizations are calling for an immediate moratorium on land titling until land rights can be equitably regularized” (e.g., Niamir, 1994; Salzman, 1994 both *In: Niamir-Fuller, 2000 In: McCarthy, et al.*, 2000) (see Chapter 5, Section 5.7.1, Property Rights and Land Tenure, Constraints to Soil Fertility and Agricultural Production.

Along with introducing sedentarization policies, colonialism greatly reduced slavery and raiding of grain by nomads from farmers, especially in West Africa. This forced an increase in cattle numbers as a “cash crop” to sell and barter for grains and other needs (Smith, 1992). This is believed to also have happened to some degree in East Africa, for instance in Kenya, where European settlers were used to create a buffer between the Maasai and various groups they traditionally raided. In fact, some believe that the pastoral strategy so successfully practiced in the past is no longer possible because of the current inability to undertake traditional transhumance movements due to sedentarization policies (e.g., group ranches in Kenya, loss of floodplains from dams across Sub-Saharan Africa,

encroachment by small-scale farmers on traditional pasture and inability to freely cross borders). With modern-day medicine and veterinary care, the periodic devastation of human and livestock populations is rare (e.g., rinderpest of the 19th century), except in extreme drought conditions and if these are present, food aid keeps people going, often resulting in aggressive confrontational raiding for food, livestock, women, grazing and watering rights or political control (see Chapter 5, Section 5.11.2, Over-population, Desertification and Instability, Nigeria; Section 5.11.4, Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics; Chapter 11, Section 11.8.6, Food Aid and NGOs in Sudan and Section, 11.8.7 Food Aid and War in Somalia).

The *Ujamaa* (*Ujama'a*) village groups of the early 1970s in Tanzania were based “on the re-creation of a ‘self-determination’ type of African socialism based, at least in part, on traditional informal customs, rules, and conventions” (Bruce, *et al.*, 1995; Kirk, 1998; Shivji, 1997 all *In*: Kirk, 2000 *In*: McCarthy, *et al.*, 1997) resulting in a “peaceful transformation of autochthonous land-tenure systems, based on common property and a family economy (homestead), into collective agriculture practiced on state land (*Ujamaa*) by village groups” (Shivji, 1997; United Republic of Tanzania, 1994 both *In*: Kirk, 2000 *In*: McCarthy, *et al.*, 1997). “About 250,000 of them lost the best of their lands and were confronted with restrictions in movement as a risk-coping strategy; village boundaries dividing communal pastures into discrete administrative units excluded them from access to wells and pastures” and had still not been resolved by 1998 (Kirk, 2000 *In*: McCarthy, *et al.*, 1997) (see Chapter 11 Section, 11.8.4, Food Aid and *Ujama'a* Villages In Tanzania).

A real danger lies in pushing pastoralists into becoming sedentary as mixed agriculturalists with livestock. Cultivation allows a population to grow well beyond the limit that simple pastoralism can support, taking grazing land out of

production and increasing grazing pressure on the remaining pasture. This establishes a vicious cycle of human and environmental degradation in marginal areas (de Vos, 1975). The net result is over-grazing, a decline in livestock quality, increased deficiency diseases linked to mal-/undernourishment and parasitic infections (Darling & Farvar, 1972 *In: de Vos, 1975*), and the threat of disease epidemiology in livestock (e.g., rinderpest). By the end of the 20th century, this was happening among the Maasai in both Kenya and Tanzania, since factors like group ranches in Kenya and land confiscation in both Kenya and Tanzania have squeezed and compressed Maasai into areas too small to support traditional nomadism, and which in many cases lack sufficient dry season grazing, if any, to support viable herds.

“The ranching model (Kenya) encouraged sedentarization, destocking, and water development. However, these were unsuccessful in increasing livestock productivity, at best, and in some cases were very destructive in the long run” (Sandford 1983 *In: Niamir-Fuller, 2000 In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

The result is over-grazing and creation of dry season dust bowls, as readily seen in Northern Maasailand on the main road between Arusha and the Kenyan border, and/or the conversion of land into small farms by Maasai or even the questionable sale of land to small or commercial farmers in Southern Maasailand, as well as around Amboseli (small-scale farmers) and Maasai Mara (commercial wheat schemes) (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya and Chapter 9, Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”).

Since 1961, the area farmed in Chad, Burkina Faso, Mali and Niger increased by over 4 million ha. This expansion involved mainly the conversion of large areas of “Common Property Resources”, such as forests, wetlands and rangelands into

cropland, with farmers overriding and ignoring the traditional use rights of other groups to these resources. Politically powerful groups and elites with preferential links to various organs of the state (e.g. civil servants, wealthy traders and religious leaders) frequently appropriated “Common Property Resources” for their own use and in the process introduced new use and management structures. In Senegal, there are several accounts dating back to the 1950s of how the powerful Mouride Islamic brotherhood had been able, with government backing, to convert large tracts of communal rangelands into peanut fields. In 1991 alone, the Senegalese government gave permission for 45,000 ha of forests (forested savanna) to be converted to peanut fields (GEF, 1998; Williams, 1998). Much of this was critical grazing lands for pastoralists (see Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal). This pressure continues in the 21st century as the Mouride brotherhood attempts to take over 44,000 ha of the 87,500 ha Ranch du Doli, most likely to be deforested and converted into more peanut fields (Gning, 2004). Smith (1992) believes that the expropriation of traditional pastoral lands by the governing elite is a problem across Sub-Saharan Africa, with pastoralists being the last to have a say over central government policies. Smith (1992) also believes that by ignoring traditional land use management practices, absentee herd-owners and their stock may be exacerbating range degradation – very likely mining range resources for short-term gain of secondary incomes (see Chapter 3, Section 3.4.2.3, The legal exclusion of the African hunter from his wildlife, Loss of Hunting and Territorial Rights by “San” Bushmen, Botswana and Chapter 11, Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana). One could argue that this problem exists with other resources, including wildlife, timber, fishery and mineral.

Furthermore, as livestock management became more intensive, wildlife became increasingly unwelcome, competing for pasture as well as becoming a reservoir

for disease (e.g., rinderpest, foot and mouth, bovine pleuro-pneumonia, sleeping sickness, etc.) (Adams, 2003 *In:* Adams & Mulligan, 2003) (see Chapter 9, Section 9.7.8.2 “Politics of despair”, Southern Maasailand “Tarangire Ecosystem” and Chapter 11, Section 11.11.9.2, Impact of donor driven conservation on private lands, Clive Aggate, Kifluku, Laikipia, Kenya).

6.1.4.7 Impacts on pastoralism and range ecology from increases of human and livestock populations in the 20th century

It is estimated that the human population in Sub-Saharan Africa has increased 5.5-6.5 times from between 95.9-114 million to 622 million between 1900 and 2000. Between 2000 and 2050, the human population is expected to increase 2.4-2.8 times reaching between 1.497 and 1.753 billion. Between 2000 and 2100, the human population is expected to increase 3.1-4.4 times to between 1.944 and 2.750 billion (see Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY). All of the above policies and misused technological interventions have been compounded by this population explosion, both human and livestock, from improved medical and veterinary care linked to colonialism.

Along with improved veterinary care, increasing human populations demanded more livestock. Livestock for many cultures was required for “bride price”, as a means of barter, as a sign of wealth and most importantly, for nutrition (e.g., fresh milk, curd/*lait caillé* and blood depending on the pastoral group). In addition, it was convertible to food (e.g., rarely slaughtered on special occasions or during extreme drought, or traded for grains and other necessities), or even currency in times of extreme deprivation such as during a drought. Thus, there is a resistance to reduce livestock numbers, as they are the savings in a pastoralist’s “traditional bush bank account”.

In Sub-Saharan Africa, when we speak of over-grazing by domestic stock, we are often referring to a human population, which has exceeded the carrying capacity of its environment. Each individual family, in order to survive, must keep a certain number of livestock. Therefore, as the human population goes up, so does the livestock population and the pressure on the grasslands. If the population of livestock is high at the beginning of a wet period, the livestock will breed up, grossly exceeding the carrying capacity of the range, and unless there is an offtake, habitat degradation will occur. When a dry cycle returns, a massive die-off takes place, sometimes amounting to as much as 40% of the livestock (Brown, 1971 *In: de Vos, 1975*).

The FAO estimated that Africa's cattle population of 170 million in 1986 would grow to 200 million by 2010. In 1986, they estimated that the overstocking rate in many places was 50 to 100%. It is estimated that Tanzania's pre-rinderpest pre-1890s cattle population of 4.5 million had grown to more than 15 million by the late 1980s and Botswana's national herd increased 2.5 times to 3 million between 1965 and 1976. The World Resources Institute in the mid-1980s estimated that 90% of the Sahel-Sudan grasslands and 80% of the Southern Africa's grasslands were over-grazed (Rosenblum & Williamson, 1990). Total livestock populations for Sub-Saharan Africa from 1961-2003 are estimated in Table 6.2, the total number increase averaging 2.3 times from 276 to 622 million animals with an annual population growth rate of 2.3% between 1961-2003.

While in 2003, camels made up only 2% of Sub-Saharan Africa's livestock population, they are crucial to the survival of herders in extremely arid areas. Among the Gabbra of the Kenya/Ethiopia border, they can supply as much as 60% of the milk during the peak of the dry season. They can satisfy their water needs from vegetation once the rains have come, going months without drinking. As the quality of the vegetation decreases during the dry season, they will need to drink more often (Smith, 1992). In northern Kenya, innovator rancher Jasper

Evans in the early 1990s introduced high milk yielding camels from India to groups such as the Samburu, as a means of providing them with milk. At the same time, the hope was that by introducing these browsers, the reduction in numbers of grazers (e.g., cattle, goats and sheep) to sustainable levels would be encouraged, thereby taking pressure off the grasslands as a means of decreasing habitat degradation in tribal areas.

Small stock (sheep, goats and pigs) make up about 63% (62% in 2003, Table 6.2) of the livestock population in Sub-Saharan Africa and are owned by the poor who cannot afford cattle (Smith, 1992). The tremendous increase in these small stock (pigs/4.9 times, goats/2.6 times and sheep/2.3 times) between 1961 and 2003 (Table 6.2) could be an indication of the increasing number of rural and even urban poor in relation to wealthier cattle owners. Also, as grazing lands become degraded, cattle will continue to browse although they are primarily bulk grazers, while small stock are better browsers (e.g., sheep 21.6% browse in their diet and goats 47.5% browse) and require less water (Smith, 1992) and thus are able to survive under degraded conditions. Thus, this increase in browsers relative to cattle could also be an indication of range degradation.

As discussed, as human populations increase and the availability of prime agricultural land and fallow periods disappears more and more, dry season pasture and water resources have been taken over by agriculturalists. Rainfed agriculture is being extended into lower and lower rainfall zones, former rainy and dry season pastures, often accelerating severe land degradation (see Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal and Section 5.9.4.7, Deforestation in savanna environments). Meredith (2004) estimates that between 1973 and 1988, Africa lost 6.1 million ha (15 million acres) of pasture.

Table 6.2: Livestock numbers Sub-Saharan Africa, 1961-2003

Date	Cattle	Sheep	Goats	Horses	Asses	Mules	Pigs	Camels	TOTAL
2003	208,352,575	164,777,455	202,072,659	2,879,762	9,036,695	293,070	20,074,510	14,557,108	622,043,834
% Of Total 2003	34%	27%	33%	0.5%	1.5%	0.05%	3%	2%	
1986	159,030,517	113,942,082	136,344,214	3,630,146	8,622,960-	545,440	11,865,890	13,136,095	447,117,344
1961	103,877,126	71,228,652	77,629,399	2,289,396	7,508,281	1,330,444	4,100,825	7,661,448	275,625,571
Times Increase 1961-2003	2.0	2.3	2.6	1.3	1.2	Decline	4.9	1.9	2.3
% Annual Population Growth Rate	1.7	2.0	2.3	0.5	0.5	-	3.8	1.52	1.9

Note: Percent Annual Population Growth Rate: (Years x r) = $[\ln(N_t) - \ln(N_0)] \times 100$, Where N = Population at Time "Zero" and Time "t," and "r" = Percent annual population growth rate
Extracted from: FAO (2004) with permission, FAO

Access to dry season water points becomes more and more restricted, as the water and the surrounding lands are utilized or occupied by farmers. In addition, more and more farmers that used to allow pastoralists to use their crop residues for their livestock are now using all the residues for their own small stock (GEF, 1998) and/or for fuel supplies. In the past, this residue along with manure from cows feeding on the residue helped fertilize the land in the form of green or cow manure (see Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel; Section 5.9.4.6, Deforestation in afromontane forests, Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization; Section 5.12.1.1, Integrated nutrient management (INM); Mitigation of Nutrient Mining in the Groundnut Basin of Senegambia, West Africa Section and 5.13.2, Net Results of Colonial and Post-Independence Periods on Sub-Saharan Agriculture).

The take over of their land combined with drought and habitat degradation is forcing many pastoralists southward. The drought of the mid-1970s and mid-1980s stimulated a significant migration of pastoralists and livestock from the arid to the sub-humid parts of West Africa.

“Countries with large percentages of arid land have witnessed reductions in their cattle populations, while countries with large percentages of more humid land have witnessed substantial increases in their cattle population. For example, between 1975 and 1987, cattle populations decreased in Senegal ($-1.8\%/\text{year}$); stayed constant in Mauritania; increased slowly in Mali ($1.6\%/\text{year}$), Niger ($2.3\%/\text{year}$), and Chad ($1.3\%/\text{year}$); and increased rapidly in Cameroon ($4.1\%/\text{year}$), Central African Republic ($8.7\%/\text{year}$), and Cote d’Ivoire ($5.8\%/\text{year}$)” (ILCA, 1993 *In: Swallow & McCarthy, 2000 In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

Fulani herders from the Sahel began permanently moving southward in the middle of the 20th century, invading countries such as northern Ghana because of degraded habitat associated with boreholes, increased human populations, loss of dry season grazing land on floodplains and compounded by the drought of the 1970s/80s. The last three decades have also been characterized by a further change in the pastoral migratory pattern. Fulani herdsmen have moved even further southwards (beyond the savanna zone) to the fringes of the humid tropical forest. These movements towards the forest zone have been observed in all the coastal countries of West Africa. Fulani herd owners from Burkina Faso and Mali have been attracted to the Ivory Coast by the lure of better pasture, lower population densities, proximity to markets, the availability of veterinary care and subsidies provided by the Ivorian state livestock parastatal (Chapter 5, Section 5.7.4.4, Land reform and civil war in the Ivory Coast). In addition to the environmental and ecological factors, the ability of the migrant Fulani herdsmen to establish reciprocal relations with the host population largely explains their migration and settlement in northern Ghana (Tonah, 2002). The principal author has seen Fulani (Bororo) herders as far south as the tropical lowland forests of Southeastern Cameroon, literally side by side with the Pygmies and gorillas. Similarly, Greig (*pers. comm.*) has seen Fulani herders crossing the CAR border into Congo Brazzaville as forest roads are opened. De Haan, *et al.*, 1997 note that

“in the eastern area of the Central African Republic, the incursion of Fulani pastoralists with their cattle in the tree parklands of the Zande people leads to:

- Increased openings in the forest cover.
- Decrease in animal biodiversity.
- Degradation of the hunting potential of the Zande, and thus the quality of their diet.
- Loss of the traditional values of the Zande people”.

This is also resulting in armed conflicts. In February 2004, 50 Christians were reported killed by Muslim warriors in the town of Yelaw in central Nigeria. This

appears to be in retaliation for Christian attacks on Muslims and friction over-grazing rights (Giardino, 2004) (see Chapter 5, Section 5.11.2, Over-population, Desertification and Instability, Nigeria). As land resources become scarcer, these conflicts are expected to increase in the 21st century in the savannas of Africa between pastoralist groups and between pastoralists and small-scale farmers as farmers move into marginal lands. Guest (2004) also explains, similarly to what is discussed in Chapter 13 (Section 13.8.6, Former Cold War allies vying for power in the Great Lakes Region and Section 13.10.1.6, Oil-scorched earth Sudan), that the British/European system of “divide and rule” favored Christian missionaries and universities in the south, while keeping the Moslem Fulani and Hausa in the north of Nigeria backwards and uneducated. This increased religious and ethnic tension eventually resulted in a “northernization” program of training and attempts to bar southerners from holding public administrative posts, winning public works contracts, running shops or owning land in the north, all of this adding fuel to the fire. The conflict in Darfur is occurring for similar reasons (Chapter 5, Section 5.11.4, Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics).

6.1.5 Possible Way Forward

Given that in the savannas of Sub-Saharan Africa, traditional pastoralism along with wildlife is ecologically considered the best land use,

“The main tenure implications are the devolution of authority to local groups, the ability to respond quickly, simple rules, and the need for access to or incorporation of a range of agro-ecological areas into the tenure system” (Lane & Moorehead, 1994 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute) (see Section 6.1.2, Carrying Capacity and Sub-Saharan African Savannas).

As with wildlife and other resources, there is a movement afoot to take a step backwards in order to ultimately go forward, devolving tenure and control over pasture management back down to the local level (Table 6.3).

Table 6.3: Comparison between the "conventional" colonialism/independence and the "opportunistic" approaches to pastoral tenure in dryland Africa

AREA	CONVENTIONAL APPROACH	OPPORTUNISTIC APPROACH
Tenure	Fixed tenure regimes: privatization (or exclusive communal)	Flexible tenure: complete mix of overlapping and integrated regimes
	Conflict issues largely ignored	Focus on negotiation, mediation and arbitration
Objectives	Registration, land title	Alternative and innovative mechanisms for securing overlapping claims
	Secure investments in open range improvements (legumes, fodder trees, paddocks, fences and water	Secure access rights to pastoral key resources (including home area and drought preparedness)
Costs	High - for the surveying, registering and administering of titles required with private property	Low – for effective allocation under communal-tenure systems
Driving Forces	National government policies: <ul style="list-style-type: none"> • Nationalization of resources • Sedentarization of the herders • Privatization of the range 	Interests of pastoralists: <ul style="list-style-type: none"> • Flexibility in resource use • No restriction to mobility • Reciprocity in access rights
Underlying Theories of Land Tenure	The “ <u>tragedy of the commons</u> ” theory	The property rights school New Institutional Economics

Source: Grell & Kirk (2000, Table 2.1 *In: McCarthy, et al., 2000*) with permission, (IFPRI).

Today, there are movements afoot to combine the best of both worlds, namely traditional controls integrated into more intensive management systems. In general, Oxby (1975 *In: Smith, 1992*) suggests that many African governments are unwilling to recognize traditional pastoralism as a viable way of life and contributor to the wealth of a nation. He recommends that the following needs of voiceless pastoralists be recognized (Oxby, 1975 *In: Smith, 1992*):

- Control over encroachment by sedentary agriculturists onto land used by pastoralists.
- Protection for rights of way through cultivated areas.
- International agreements to allow the movement of herds and herders to traditional pasture and markets, implying free movement across national borders necessary for their survival.
- Ensuring pastoralists receive a reasonable share of proceeds from sale of their animals for meat.
- Phasing out deep wells and boreholes in favor of smaller shallow wells maintained by pastoralists themselves.
- More emphasis on pasture and fodder projects, rather than water.
- Giving pastoralists access to mobile support services, discouraging concentration around central points. This includes *écoles nomads* (mobile schools including adult education), mobile clinics/paramedics and roving veterinarians.

6.1.5.1 Cross-border transhumance agreements between the Ivory Coast, Burkina Faso and Niger

“Bilateral agreements have been developed between Ivory Coast, Benin, Burkina Faso and Niger that fix regulations for transhumance and the principle of authorization of transhumance between the countries. Specifically they include the following” (van der Linde, Oglethorpe, Sandwith, Snellson & Tessema, 2001):

- “Foreign herders will receive the protection of the host authorities and their rights are guaranteed by the judicial structures of the host country.
- Herders have to respect the laws of the host country.
- Herds have to be guarded continuously by a sufficient number of herders.
- Herders are required to keep, and produce upon request, an international transhumance certificate (showing origin, destination, composition of the herd and the vaccinations received).

- Every country has to specify the places where animals can officially enter and leave the country.
- The host country has to fix the period, duration and number of animals authorized for a stay in the country during the transhumance circuit (van der Linde, Oglethorpe, Sandwith, Snelson & Tessema, 2001)”.

Transhumance cross-border movements are occurring with or without official agreements across Sub-Saharan Africa. Agreements, as above, may provide some legal protection to pastoralists and also help in a collaborative effort with local herders to better manage grazing lands on the subcontinent.

6.1.5.2 Decentralization and creation of pastoral associations in West Africa

As part of the decentralization process, pastoral organizations (PO) have been organized throughout West Africa as a new type of community-based NRM institution.

“The POs treat all types of institutional arrangements that regulate individual and collective actions by pastoralists in an attempt to safeguard and promote their economic, social, cultural and political interests. They are legally organized by the government and dependent on the state for technical assistance, supplies and financial resources (Vedeld, 1992 *In: Moore, et al., 2000*). The functions of the POs are related to acquiring secure land tenure, resource management, provision of services, communication of information, external relations and the building and maintenance of community coherence and morale. Key factors that determine the viability of POs include food security, water security, land security, herd ownership, credit, veterinary services, marketing, economic self-sufficiency and literacy (Shanmugaratnam, *et. al.*, 1992 *In: Moore, et al., 2000*). Although POs have been successful in organizing pastoral communities, integrating the POs with the GT (*Gestion des Terroirs*) and other management systems remains problematic” (Moore, *et al.*, 2000) (see, Chapter 5, Section 5.12.3, Decentralization and Chapter 9, Section 9.8.9 *Gestion des Terroirs*, West Africa).

"In Niger, it has taken the form of a legislative reform of land tenure and natural resource management policy conducted over a 10-year period from 1985 to 1994. In Burkina Faso and Mali, land use planning based on the concept of "village territories" (or gestion des terroirs) has become very popular. In all cases, governments have sought to clarify tenure issues and reinforce the rights of local communities to manage their resources through granting of legal recognition and decision-making authority...While experience with implementing these new programs is still limited, they nevertheless represent a departure from the top-down, centralized resource management policy of the past. However, simply assigning authority to local users, without ascertaining the range of uses of a resource, the diversity of interests among users and the capability of existing local institutions to take on additional responsibilities, will only complicate rather than solve the problems associated with the appropriation and management of CPRs (Common Property Resources). This is because CPRs in the region have multiple functions and are exploited by a wide variety of user groups...Failure to recognize the rights of all existing users will lead to the appropriation of key resources by the more powerful groups or those practicing a particular system of production, which may eventually result in social conflicts or inefficient utilization of the diverse set of CPRs. This is one reason why the village territory approach has come under criticism. Because the concept is more applicable to settled farming villages with a clearly defined territory and set of resources, it has been argued that there is a danger that the approach may empower sedentary farmers to exclude transhumance pastoralists from grazing resources they previously had access to, especially where the farmers themselves are beginning to manage their own animals" (Lane & Moorehead, 1994 *In: Williams*, 1998).

Moore, *et al.* (1999) draw similar conclusions. Grell and Kirk (2000 *In: McCarthy, et al.*, 2000) also note that even today

"the perception of pastoral tenure in the Francophone countries is much biased toward centralization, with priority being given to agricultural land use and the conventional approach of exclusive private property". "A herder (Peulh/Peul/Fulani) can never take possession of land' was the statement of a village chief at a workshop held in 1996 on conflict management in Bobo-

Dioulasso” (PRASET, 1996 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

Ouédraogo (1997 *In:* Bouderbala, Cavérvrière & Ouédraogo, 1997 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute) “referring to pastoral-tenure rights, points out that West African herders in all workshops have always insisted that the goal of pastoralists is not to lay claim to private pastoral property, but rather to participate in property regimes and to secure access-rights for herders”.

“However, as they (pastoralists) are not present on a permanent basis, their specific interests often are forgotten when decisions are being made on the village level. This has been recognized as a weakness of the ‘gestion des terroirs’ approach (Marty, 1996a *In:* Lycklama à Nijeholt, de Bie & Geerling., 2001), and efforts are being made to improve the position of herders in the village level decision making process and to secure their access to resources in different ecological zones” (Lycklama à Nijeholt, *et al.*, 2001).

“The typical approach of *gestion des terroirs*, or land use planning, is oriented toward a geographically well-defined area in which the land use planning takes place. This is the right approach in environments with sufficient rainfall, and where land use systems are based on farming or ranching. However, non-equilibrium environments differ essentially in that the mobility of herds is the crucial factor for sustaining livelihoods” (Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

The following shortcomings have been identified in the literature on the subject (Marty, 1993; Painter, Sumberg & Price, 1994; Engberg-Pedersen, 1995 all *In:* Niamir-Fuller, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute):

- “Existing informal local institutions for decision making are often overlooked.

- Significant differences between the interests of leaders and non-leaders are ignored.
- There are inconsistencies between the approaches' goals for natural-resource management and villagers' goals for infrastructure and social development.
- Government was unable to provide adequate incentives for people to undertake resource-conservation activities that are labor intensive and have noticeable returns only in the long run.
- The high spatio-temporal variability of resource endowment in dryland areas is underappreciated, as evidenced by the focus on promoting exclusionary mechanisms in land-tenure systems.
- The focus on the village (or groups of villages) is spatially myopic.
- Mobile pastoralists are ignored or delegated to a secondary 'receptive,' rather than proactive, position".

Elbow (1996 *In:* van der Linde 2000 *In:* McCarthy, *et al.*, 2000) has found that *terroir* land use planning is favored by French development agencies and by governments of former French colonies in the Sahel.

"The concept of *terroir* is originally an analytical unit describing the physical space on which sedentary villagers get most of their means of subsistence. This analytical unit is now used as an intervention unit in a drive to give rural communities greater responsibility in the management of their resources. Although it may be early to assess the impact of the *terroir* approach on land tenure, some elements need to be highlighted here. Because it has essentially been used as a concept linked with sedentary agriculture, the concept of *terroir* is not compatible with highly mobile lifestyles (Painter, *et al.*, 1994; Marty, 1996b both *In:* van der Linde, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

"Since the *terroir* approach as it now stands may lead to the risk of further marginalization of herders" (Marty, 1993; Toulmin, 1993; GTZ 1995; Winckler, Rochette, Reij, Toulmin & Toé, 1995 all *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000), "one proposition is to concentrate on access rights to key resources or focal-point management", which according to Behnke (1994 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute) will:

- “Concentrate management attention on the essential resources of the production system and devote much less effort to the clarification of property rights.
- Allow producers who control key natural resources to exploit more peripheral resources and exercise de facto control over these resources.
- Permit the continuation of customary tenure arrangements that encourage the shared use of resources that are not in high demand by de-emphasizing the need for strict boundary maintenance”.

According to Grell and Kirk (2000 *In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute),

“The answer is community-based natural-resource management/CBNRM (*gestion des ressources naturelles à base communautaire*), which combines both the land and the resource dimension in an approach based on common-property rights. The focus is on key-resource management and the necessary institutional arrangements that allow all user groups to participate...However, very few of these projects have tackled the ‘problem’ of mobility. Only a few projects have attempted to implement this approach among mobile pastoralists...The Community Based Resource Management approach is far better suited to mobile pastoralism than any other approach; however, it must deal with the issue of scale. Mobile pastoralism requires large-scale management of contiguous land” (Niamir-Fuller, 2000 *In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute).

Grell and Kirk (2000 *In: McCarthy, et al., 2000*, Excerpted with permission from the International Food Policy Research Institute) go on to recommend:

- Division of responsibilities and decision-making must be clearly spelled out and devolution as in CBNRM in general must be to the lowest possible level, while being wary of the concept of homogeneous groups of pastoralists or any other user groups with the likelihood of

privatization of resources and increased disparities between individuals and groups as population pressures grow and resources become commercialized.

- Democratic legitimization of pastoral organizations with the question of internal democracy at a number of levels is still an issue (Mortimore, 1997 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).
- Herders' attitudes must change from an opportunistic management strategy of what they can get to rather what they can do (Ly, 1998 *In:* Grell & Kirk, 2000 *In:* McCarthy, *et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute). Pastoral reform is currently still being driven by outside researchers and donor advisors rather than the herders themselves who cry for help but are not proactive.

de Haan, *et al.* (1997) recommends the following conditions in reestablishing local management over pastures:

- Increasing the costs of grazing in order to reduce animal pressure promoting earlier off-take.
- Levying grazing fees for communal areas.
- Full cost recovery especially for water supply and animal health services; water often seen as a free resource supplied by the public sector (e.g., in form of boreholes and their maintenance).
- Removal of price distortions for other agricultural inputs to reduce the conversion of key pastoral resources into marginal crop land.

“Decentralization alone will not solve the problem of transhumance, which affects more than one local administration and several areas” (Mortimore, 1997 *In:* Grell & Kirk, 2000 *In:*

McCarthy, *et al.*, 2000). “Pastoral mobility must be ensured through negotiation and renewable accords supported by reorganization of the territories, delimitation of administrative boundaries, and the empowerment of local institutions” (Grell & Kirk, 2000 *In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).

There is a need to provide support for the formation or strengthening of local organizations where they are non-existent or weak. Institutional strengthening and training can be provided by government agencies in such areas as management and leadership skills and program planning. In addition, local users generally possess inadequate scientific knowledge to complement their own indigenous knowledge as they move into more intensive management situations. Yet, access to reliable information on resource conditions and the effects of different resource use patterns is essential for the long-term management of “Common Property Resources” and the sustenance of livelihoods that depend on them. State institutions can assist local users by carrying out environmental assessments of resource use patterns and determining resources, which are being degraded or at risk, and providing training on improved management techniques (GEF, 1998; Williams, 1998) and resource monitoring. This implies a need to select youth from these areas for advanced vocational training at a secondary and tertiary level. If boreholes are present or planned, the movement of livestock and the opening and closing of these boreholes must be carefully planned and managed by trained technicians from the communities. To date the reality on the ground in key countries is:

- **Niger:** The Rural Code of 1993 is biased in favor of agricultural land and does not correspond to the reality of pastoral-resource management, which is directed toward access rights to natural resources and not to private ownership of land (Grell & Kirk, 2000 *In: McCarthy, et al.*, 2000,

Excerpted with permission from the International Food Policy Research Institute).

- **Mali:** The legal recognition of herder organizations and the pastoral vocation of land (*domaine pastoral*) is part of the actual process of decentralization being land-oriented rather than resource-oriented, with 10,752 villages having formed 682 rural communes where expectations for local development are high (Michel, 1998 *In: Grell & Kirk, 2000 In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute). Concern exists that “cutting up the country between the communes will increase sedentarization of herders in home areas (*terroirs d’attaches*) and lead to further weakening of the existing, traditional pastoral tenure with regard to transhumance movements” (Soumaré, 1997 *In: Grell & Kirk, 2000 In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).
- **Burkina Faso:** The land organization reform, *Reforme Agraire Foncière*, was adopted finally in 1997, but concrete acts on procedures for property rights, especially common-property rights on pasture lands, have not been passed...However, the official approach on pastoral land-tenure is still orientated toward grazing reserves, or zone pastorals (Sanon, 1996 *In: Grell & Kirk, 2000 In: McCarthy, et al.*, 2000), and sedentarization of herders, with a coercive regulatory approach (Zeba, 1996 *In: Grell & Kirk, 2000 In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).
- **Guinea-Conakry:** Guinea-Conakry is the first country in West Africa that has adopted a Pastoral Code (*Loi du 29 Août 1995 Portant Code*

Pastoral). In general, access to pastoral areas is free (Article 14). The law recognizes the pastoral use of natural resources (*à des fins pastorales*) and defines access rights (*droits réels particuliers*) with the restrictions of not overusing the resources and of respecting customary rights of other users (Articles 75–76) (Grell & Kirk, 2000 *In: McCarthy, et al.*, 2000).

- **Ethiopia:** “National institutions are afraid that they may inadvertently open a loophole for the displacement of farmers from their holdings through the implementation of certain tenure policies” (Grell & Kirk, 2000 *In: McCarthy, et al.*, 2000, Excerpted with permission from the International Food Policy Research Institute).
- **Namibia:** All people of Namibia have the constitutional right to settle themselves at any place in the country. Together with the uncertainty about rights and the authority of traditional leaders and local government, this fact contributes to an uncontrolled exploitation of rangelands and resources of local communities by outsiders. A possible solution might be to distinguish between the ‘right to settle’ and the ‘right to use’ the resources (Kruger & Kressierer, 1995 *In: Grell & Kirk*, 2000 *In: McCarthy, et al.*, 2000). With regard to pastoral tenure, this entails, under the specific conditions present in Namibia, a combination of a private-property (ranching) model and a common-property model in areas where priority in access to pastoral resources is given to the local herders (Grell & Kirk, 2000 *In: McCarthy, et al.*, 2000) (see Chapter 9, Section 9.7.2.1, Devolution through policy reform, land and resource tenure).

6.1.5.3 The old and the new on Ol Maisor Ranch, Laikipia, Kenya

The Laikipia ranch area is unique in a number of ways. This area contains about 31 major ranches ranging from some as small as 3,644 ha (9,000 acres) to others as large as 48,583 ha (120,000 acres). While black Kenyans own some of the ranches (e.g. retired General Lenges of the Kenyan Army, the Ol Doinyo Lemboro Ranch (Samburu), one owned by a Maasai), most are white-owned, and a number are owned by non-resident Europeans or Americans who do not rely on these ranches for survival. These ranches are bordered in the north by Samburu Mukogodo Maasai Tribal Lands and are slowly being encroached upon on their southern borders by smallholder farmers coming from the over-crowded Kikuyu Highlands, who are being permitted to buy land that should never be put into farming because of the low rainfall and poor soils (see Chapter 3, Section 3.11.1, Population, Kikuyu and the Mau Mau and Chapter 11, Section 11.11.9, Kenya Wildlife Service (KWS) – Living on donor handouts, negative impact on Kenya's wildlife outside parks). The area contains significant populations of wildlife, including the second largest elephant herd in Kenya: 3,436 elephants compared to nearly 8,056 in the Tsavo region (King, Kahumbu, Omondi & Douglas-Hamilton, 1999). The Laikipia area is extremely important with regard to the future of wildlife outside of Kenyan parks and reserves, not only because of the numbers of wildlife found on private lands, but also because of the practical knowledge base that ranchers have with regard to wildlife, livestock and range management. In addition to elephant, wildlife found on the Laikipia ranches includes but is not limited to Grevy's zebra (*Equus grevyi*), Thompson's gazelle (*Gazella thomsonii thomsonii*), Northern Grant's gazelle (*Gazella granti notata*), Cape buffalo (*Syncerus caffer caffer*), East African impala (*Aepyceros melampus rendilis*), lion (*Panthera leo*) and cheetah (*Acinonyx jubatus*) (Evans, *pers. comm.* In: DeGeorges & Pellek, 1991). This wildlife will serve as an important nucleus to restock traditional group ranches in the area, once Kenya gets its wildlife laws and

policies corrected (see Chapter 9, Section, 9.6.1.2, Kifluku Farm, Laikipia, Kenya and Section 9.8.7, Ngwesi Lodge, Mukogodo Pilot Tourist Program, Kenya, as well as Chapter 11, Section 11.11.9, Kenya Wildlife Service (KWS) – Living on donor handouts, negative impact on Kenya's wildlife outside parks).

Because of East Coast Fever, cattle have to be dipped weekly or every ten days. Soils and forage grasses/plants in the area are deficient in magnesium, iodine, copper, phosphorous and calcium. A formula with these minerals is prepared and put into drinking troughs for the livestock. Low calcium and phosphorous in the diet can result in stillborn animals and broken bones (DeGeorges & Pellek, 1991).

Ol Maisor is an unfenced 12,146 ha (30,000-acre) ranch in Rumuruti (Laikipia Highlands) owned by innovator farmer Jasper Evans. This ranch has no dry season grazing habitat. Evans has developed an African solution to an African problem. This solution takes Western management concepts but uses traditional knowledge of the Turkana (DeGeorges & Pellek, 1991; Powys, 2003) and Samburu herdsmen (DeGeorges & Pellek, 1991) as to when grazing pressure is to the point that the livestock should be moved. Instead of expensive wire fencing, Acacia branch night *bomas* protect the livestock from predation, since fencing is continually stolen. Fifty small minimal maintenance rainfed catchments strategically located about the ranch have been turned into ponds/watering points created by using a locally designed “dam scoop” attached to a camel or cow. In the early 1990s, 2-3,000 cattle were maintained on the ranch at a stocking rate of one cow per 4.1 ha (10 acres) (DeGeorges & Pellek, 1991). Powys (2003) believes that one cow/7.3 ha (18 acres) is more accurate. Herds are generally organized into 100-200 animals. Each herd spends six to eight weeks grazing in the vicinity of a dam and is then moved onto a new dam site and thus grazing area. This movement is based on a decision made jointly between the ranch manager and the herder. This ranch also runs approximately 2,500 head of sheep

and goats and 500 camels. Unless there are very dry years, both water and grass are adequate to maintain the herds on Ol Maisor. Techniques such as buying undernourished extensively grazed cattle from the tribal areas and then intensively grazing them for a couple of months prior to selling them to the abattoir are other innovative ways of maximizing the carrying capacity on marginal lands that are employed by Jasper. Rotational burning takes place every three years to eliminate moribund grasses, stimulating grass growth/production and livestock production (Evans, *pers. comm.* In: DeGeorges & Pellek, 1991).

6.2 BOREHOLES AND WILDLIFE

Wildlife reacts similarly to livestock with regard to ill-placed boreholes and watering points by over-grazing. On the other hand, properly placed watering points can be used to spread out the game, as with cattle, diffusing pressure on habitat that might otherwise be over-grazed, when game like cattle concentrate around a few sources of water. All of this implies active management, going so far as to open and close watering points as a means of moving the game about to take advantage of the complete array of habitat.

6.2.1 Boreholes and Wildlife, Kruger National Park, South Africa

Nowhere is the impact of watering points and boreholes on wildlife better demonstrated than in the intensively managed parks and game reserves of South Africa. These examples demonstrate how little is known about the interrelationship between species and how species relate to various changes in biotic and abiotic parameters within the environment.

The Kruger National Park covers an area of 20,000 km² in the eastern lowveld of South Africa. When the Kruger National Park was established in 1926, areas between perennial rivers were largely devoid of permanent water.

“Reasons given for the stabilization of the water supply included: making the more arid areas accessible to game in order to spread the animals more evenly over the whole KNP; discouraging the emigration of animals out of the KNP before it was fenced; blocking of migration routes after it was fenced; prolonged droughts; and the deteriorating state of perennial rivers” (Pienaar, Biggs, Deacon, Gertenbach, Joubert, Nel, Van Rooyen & Venter 1998 *In: Brits, 1999*).

By 1970, five medium-sized dams and 32 water points, supplied from boreholes by wind mills were constructed in the northern 1,300 km² range of the roan antelope. By 1976, there were nine dams and 46 wind mills, and by 1994, 11 dams and 59 wind mills in the northern portion of the park (Harrington, Owen-Smith, Viljoen, Mason, & Funston, 1998; 1999). The Kruger National Park as a whole has “at present 283 artificial watering points where drinking water for large herbivores is supplied in troughs, 42 concrete dams and 51 earthen dams, giving a density of artificial watering points of about one per 5,000 ha” (Pienaar *et al.*, 1998 *In: Brits, 1999*). Thus, over 96 % of the Kruger National Park, the average distance between permanent surface water is about 7 km (Pienaar *et al.*, 1998 *In: Brits, 1999; Brits, van Rooyen & van Rooyen, 2002*).

“Water-dependent herbivores are forced to congregate within walking distance from the watering points in the dry season” (Young, 1970 *In: Brits, 1999*). “This range has been estimated as 10 to 15 km in the Amboseli ecosystem (Western, 1975 *In: Brits, 1999*) and 12 to 16 km in the Kruger National Park” (Van der Schijff, 1957 *In: Brits, 1999*). A recent study in Kruger National Park concludes that grazers, including blue wildebeest, zebra, tsessebe, roan, sable, white rhino and buffalo that do not obtain adequate moisture from their food during the dry

season, tend to be positively associated with waterholes. Browsers such as kudu and giraffe are neutral in this relationship, and along with mixed feeders (excluding eland) are positively correlated with rivers. Similarly, water dependent elephant and waterbuck are more associated with rivers where it appears they are able to meet all their needs including habitat and forage. The major difference in nutrient rich basaltic soil areas compared to nutrient poor granitic soil areas with regard to the relationship between these species and water is that herbivores in the granitic areas must travel further from the water source to meet nutritional requirements. It also concludes that “grazers are therefore the feeding group that will be most affected by any changes in the water provision policy of the KNP” (Smit, Grant & Devereux, 2007).

“Most of the rangeland in the Kruger National Park is approximately 7 km from water and is therefore within reach of mobile water-dependent herbivores. Ecological carrying capacity for these animals is thus no longer affected by water availability, but is solely determined by the productivity of the vegetation” (Zambatis, 1985 *In:* Brits, 1999).

“Underutilized rangeland is an agricultural rather than a conservation concept. Although it is not desirable that underutilized rangeland dominates a conservation area, it should be viewed as habitat that should be preserved” (Collinson, 1983 *In:* Brits, 1999). “However, since few areas in the KNP are now farther than 10 km away from water, these underutilized habitats, with the herbivores and plants that are adapted to them, are now disappearing” (Thrash, 1993 *In:* Brits, 1999).

Likewise, the spacing and location of watering points is impacting wildlife distribution and speciation.

In the Kruger National Park, historically, roan antelope (*Hippotragus equinus*) have been almost entirely confined to the northern, drier half of the park with a

mean rainfall of 450-500 mm. The Kruger National Park population represents the southern margin of distribution for the roan species (Harrington, *et al.*, 1998).

Following the year-round provision of water in the northern portion of the park, populations of zebra and wildebeest numbers increased by 30%. Predators followed their prey species north with dire consequences for the roan (Harrington, *et al.*, 1998).

The population of roan had oscillated between 150-300 for about 60 years since the proclamation of the Kruger National Park (Grant, Davidson, Funston, & Pienaar, 2001; 2002). High rainfall (1986) and an abundance of palatable grasses followed by lower than average rainfall resulted in first an increase and then a decrease in roan numbers (Harrington, *et al.*, 1998; 1999; Grant, *et al.*, 2001; 2002) (Table 6.4):

The locally endangered roan antelope population of less than 50 roan was not viable according to genetics criteria (Harrington, *et al.*, 1998; 1999). Two other rare antelope species also showed population declines, the sable (*Hippotragus niger*) down to 85 by the end of the 1992 drought, five seen in 1997, three in 1998 and the Tsessebe (*Damaliscus lunatus*) down from 136 in 1992 to 35-40 by 1998 (Grant, 1999).

Table 6.4: Decline of roan antelope, Kruger National Park

Date	Roan Numbers
1977-1985	300
1986	450
1988-1991	150
1992	70
1993	44

Source: Harrington, *et al.* (1998) and Grant, *et al.* (2002) with permission, Koedoe.

Owen-Smith believes that both loss of food from over-grazing by zebra and wildebeest and increased lion populations were the key to the decline in roan populations (Owen-Smith, 1996). It is hypothesized that lions probably established territories around the artificial water points where prey concentrated. Roan coming to drink would face a greatly increased risk of predation (Harrington, *et al.*, 1998; 1999). The central cause for the ecological changes noted above is believed to be the provision of numerous artificial water points in the roan range, which attracted the influx of zebra and wildebeest during drought conditions in 1982/83, setting off this chain of events (Harrington, *et al.*, 1998; 1999). As noted earlier, bush encroachment appears to be another major factor impacting on roan and sable populations (see Section 6.1.4.4, Bush encroachment versus desertification), as well as decreasing rainfall (Owen-Smith & Ogutu, 2004 *In: Cumming, 2004 In: Child 2004*).

By March 1994, most of the windmills (12) in the prime roan habitat (Mills, Biggs, Funston, van der Walt, Viljoen & Viljoen, 1995) were closed on the Northern Basalt Plains (NBP) in an effort to decrease the zebra numbers (Grant, 1999). Zebra and wildebeest populations decreased due to the closing of the windmills and increased rainfall, allowing them to disperse, and in the case of the zebra, high predation rates. While the roan population appears to be in the process of recovery in the area where water points have been closed, it has been virtually eliminated in regions where water points remain (Funston, 1997; Harrington, *et al.*, 1998; 1999). This demonstrates that improperly placed and managed water points can pose a threat to biodiversity. The more common water-dependent species may increase at the expense of rare species, with the latter adversely affected by changed habitat conditions and predation pressure.

6.2.2 Boreholes and Wildlife, Klaserie Private Nature Reserve, South Africa

Similarly, in the 600 km² Klaserie Private Nature Reserve, a conservancy adjoining the central district of the Kruger National Park, the total biomass of ungulates was 40% greater than in the adjacent section of the Kruger National Park. After the 1982/83 drought, the ungulate biomass was 40% lower in the Klaserie Private Nature Reserve than in the Kruger National Park. In Klaserie, wildebeest, zebra, buffalo and waterbuck suffered 80-90% mortality, impala declined by 75%, four sables remained from a population of 50, and only four of 13 white rhinos survived. In neighboring Kruger, wildebeest and zebra declined by less than 10%, sable by 15%, waterbuck and buffalo by 30%, impala by 35% and white rhino were unaffected. The difference in herbivore mortality appears to be a result of differences in mean water point spacing: 2 km in Klaserie versus greater than 10 km (other references claim 7 km) in Kruger. In Klaserie, water points were so close together that no reserve grazing remained and animals starved to death (Owen-Smith, 1996).

6.2.3 Boreholes and Wildlife, Hwange National Park, Zimbabwe

In the Hwange National Park, Zimbabwe, the only perennial pools originally were in the Deka River floodplain along the northern boundary of the park. In 1962, Hwange's carrying capacity was 5,000 elephants (Thomson, 2003). About 50 boreholes were drilled to provide water to selected seasonal pans, resulting in a buildup of elephant, buffalo and zebra within the boundaries of this 14,000 km² park, mainly in the north and northeast tourist areas. Dams on seasonal rivers were also constructed. This resulted in 25% of the park being available to water-dependent herbivores during the dry season. By 1995, it was determined that even if the 22 critical boreholes could be maintained, this would supply only 20-40% of the water demand by elephant, which in turn was 80% of the total demand by all

wildlife (Owen-Smith, 1996). By 1991, the Hwange elephant population was estimated at 31,978. Unless more pumps could be maintained, the elephant population would need to be drastically reduced or the elephant would be forced out of the park, resulting in major human-elephant conflicts (Owen-Smith, 1996). Thomson (2003), former chief warden of Hwange, discusses the die-off of elephant, buffalo, etc., counting 778 head of dead game alone along one 20.7 km (8 mile) stretch of road leading to a remote dam during the 1962 drought. He goes on to conclude that a properly managed game reserve must be managed for a drought year, meaning that during normal and good rainfall/vegetation years, the number of animals being carried must be kept below the habitat carrying capacity for game during those “good years”, which will be much higher than the carrying capacity of drought years. This will “result in the habitats having a sufficient nutrient cushion (thus vegetation) to consistently absorb the effects of below-average-rainfall years” (Thomson, 2003). Today, Hwange is an ecological basket case. Hwange’s elephant population in 2000 was estimated at from 50-60,000, well above the 5,000 required to maintain biodiversity (Thomson, 2003). In 2000, Zimbabwe’s entire national park estate was estimated to have a dry season carrying capacity of 30,000 elephant, while the national population of approximately 84,000 elephant was about 45,000 beyond dry season carrying capacity (Machena & Chimuti, *pers. comm.*) (see Chapter 10, Section 10.4.5, Does CITES Help Southern African Elephant Conservation?).

6.2.4 Boreholes and Wildlife, Botswana

Eland moving westwards into the Kalahari Gemsbok Park, South Africa, during very dry conditions in 1985 suffered 35% mortality. This was ascribed to the provision of artificial water points at the end of the dry end of the population range where food availability was inadequate. Migration corridors may be needed

if these declines are to be reversed (Owen-Smith, 1996) (see Chapter 11, 11.7.7.1, Lomé Convention and subsidized beef in Botswana).

In the Chobe National Park and adjoining regions of northern Botswana, perennial water was until recently available only from the Chobe and Linyanti Rivers on the northern boundary and a few pans pumped erratically from boreholes. Extremely high elephant densities ($5-13/\text{km}^2$) developed along the Chobe and Linyanti riverfronts after seasonal pans ran dry. Because of concern about elephant impacts on riparian vegetation, numerous boreholes were drilled to supply water to the interior throughout the year (Owen-Smith, 1996). It would be interesting to know what, if any, unplanned adverse impacts occurred from this manipulation of nature, and if these boreholes have been actively managed to move elephant and other game around the Chobe area. Thomson (1997) describes the current conditions at Chobe,

“approximately 95% of the very narrow (but very important) riverine forest has already been destroyed and, devoid of vegetation cover, most of the topsoil on the steep bank has already washed away...the once rich Acacia/Combretum woodland habitats...on the broad alluvial planes immediately behind the riverine forest strip are virtually all gone...replaced by just 4 species of largely unpalatable woody scrub...away from the Chobe River the teak forest complexes, which grow...are in various stages of progressive, sometimes serious degradation. The syndrome started with too many elephant, over many years, opening up the top canopy of the forest...permits extra sunlight to penetrate the ground below – which promotes heavy grass growth where no grass grew before...so uncontrolled bushfires complete the cycle of destruction, scorching the under storey plants and tree saplings, and making conditions better for even more grass to grow. Now uncontrolled bush fires have become the most important agent in habitat change in the teak forest complexes of Chobe. In scientific terms, when one habitat modifying force (elephants) is replaced by another (fire) – as has happened at Chobe – it is said the ecological circumstances of the habitat have

'flipped'. The Chobe National Park, therefore, is now well advanced towards becoming a desert..."

Certainly, placing unmanaged boreholes into the interior away from the Chobe River facilitated, though it may not have stopped this process, given the out-of-balance elephant population. The estimated elephant population in northern Botswana's Chobe/Okavango Delta Complex was at 80,000 in 1998 (Gibson, Craig, Masogo, 1998), the management objective being 46,500 to 63,000 elephants for this area (DWNP, 1991) (see Chapter 10, Section 10.4.5, Does CITES Help Southern African Elephant Conservation?).

6.3 GUIDELINES FOR WATERING POINTS

Norman Owen-Smith has established a set of guidelines for water points in extensive protected areas. Though developed for wildlife, they can be equally applied to livestock. In both cases, by injecting year-round sources of water in rainy season dispersal areas, intensive management of available water will likely be obligatory as a means of controlling grazing pressure, by moving the grazers to other less-grazed areas. As demonstrated above, too often the active management of these perennial water supplies has been ignored, resulting in severe habitat degradation and in severe droughts and wildlife/livestock population crashes from inadequate food supplies.

Owen-Smith explains that populations of water-dependent herbivores typically show a dry season concentration near permanent water and wet season dispersal into areas removed from rivers or other perennial water sources. In most African wildlife systems, migratory species comprise the bulk of the large herbivore biomass. During the rainy season, they have traditionally dispersed into areas that are waterless during the dry season. This helps relieve the vegetation near

permanent water bodies (e.g., floodplains and other riparian habitat). Exceptions are waterbuck, impala, puku/kob, hartebeest and hippo, which tend to remain sedentary near permanent water holes (Owen-Smith, 1996). Traditional movement of nomadic pastoralists and their livestock followed similar movements, often side by side with the game.

Adding water points away from rivers or other perennial water sources reduces the extent of the wet season dispersal area relative to the dry season concentration area. In extreme circumstances, the entire area becomes accessible to water-dependent herbivores throughout the dry season. In such cases, plants lack a recovery period and areas of vegetation degradation coalesce, combining to form human-made deserts (Owen-Smith, 1996) and/or degraded bush encroached habitat.

Vegetation near water points needs to be relieved of herbivore grazing pressure during the wet season, so that plants can recover from severe grazing and trampling that they experience during the dry season. The distribution of water points determines where vegetation impacts occur and the seasonal duration of these impacts (Owen-Smith, 1996). Thus, both humans and their livestock, and wildlife react to these boreholes in similar ways and with similar impacts on the natural system. Owen-Smith (1996) suggests the following guidelines

1. Surface water availability forms the primary limitation on the distribution of large herbivore populations in semi-arid environments.
2. Species that predominate in biomass, notably elephant, buffalo, wildebeest and zebra are most affected by water distribution.
3. Some ungulate species can survive long periods without drinking, except during severe droughts.

4. Abundant water points favor common ungulates at the expense of rarer species through predator-mediated interactions, as well as vegetation impacts.
5. Excessively close spacing between water points increases starvation-induced mortality during droughts.
6. Temporary water sources alleviate pressures on vegetation near permanent water by reducing the period of concentration in these regions.
7. Because of seasonal water supplies, water dependent wildlife in Southern Africa may spend only about four months of the year near perennial water sources, meaning that the wet season grazing area could be twice that of the dry season. This is assuming that the productive potential of the two areas is similar.¹¹³
8. If the above is true, then the extent of the wet season range in area should be 2 times that of the dry season range to achieve equivalent grazing pressure.
9. It may be more acceptable to have more severe defoliation during the dry season when plants are dormant, than during the wet season period of growth. The critical period is early in the wet season when grasses are recovering from the previous season's defoliation.
10. For point sources such as boreholes, to achieve a 2:1 ratio of wet/dry season range, water points should be separated at least 3 times the potential travel distance of animals from water to grazing areas. Daily journeys of up to 5 km are typical for medium sized ungulates like

¹¹³ Note: In the Sahel, wildlife and livestock may spend more time than 4 months at perennial water sources, where rainy seasons are 4-5 months in duration and dry season floodplains are, or were extensive before massive hydropower dams that have drastically reduced floodplain ecosystems all over Africa, the traditional production systems for millions of rural Africans, their livestock and wildlife (e.g. See Chapter 7, Section 7.8.9.5, Waza Logone Floodplain, Cameroon, Impacts on Elephant and Livestock Populations, Waza National Park – where livestock remain on floodplains for six to eight months a year).

wildebeest and zebra, though buffalo and elephant can travel further. Thus, 15 km spacing is suggested between perennial water points.¹¹⁴

11. For linear water sources such as rivers, the minimal spacing needed is 6 times the daily travel distance to achieve the 2:1 ratio. Establishing perennial water sources between rivers should not be considered unless spacing between rivers exceeds 30 km. Stabilizing seasonal pans between rivers is not recommended if the distance between rivers is less than 60 km.

Factors such as uneven grazing pressure because of preferences for certain vegetation types and the possible active management of opening and closing water holes to move wildlife and or livestock around need to be considered.

6.4 CONCLUSION

Boreholes continue to be placed across Africa's savanna lands by well-meaning governments, donors, missionaries and other NGOs with little or no regard for the consequences Jasper Evans in Laikipia has proved that livestock can be managed and that wildlife can even be integrated onto lands with no dry season grazing through applying intensive management principles. As discussed in previous chapters, the lives of many nomadic pastoralists have forever changed in the 20th century through land compression to make way for European settlers and parks/hunting blocks, the population explosion, land tenure (e.g., centralization and privatization) and ill-placed boreholes. The net result has been the disruption of traditional management systems, the consequence of this being over-grazing that results in desertification or bush encroachment, depending on factors such as rainfall and intervention by man. When a drought occurs and pasture production worsens, massive die-offs occur, which to some degree probably always took

¹¹⁴ Similarly in KNP, Smit, *et al.* (2007) recommend at least 12 km between waterholes for similar reasons.

place during such times, but now may be worse since there is little reserve pasture. Large areas of Africa are already over-grazed, displacing perennial with less nutritious annual grasses.

What is missing? Processes that devolve ownership of land back to communities and re-empower them to manage their pasture lands on a communal basis make a lot of sense, just as they do for wildlife, fish and forests. However, pastoralists have been moved from extensive into intensive management systems, where boreholes must be opened and closed and/or cattle and wildlife actively/passively moved from watering point to watering point to avoid over-grazing in any one area, since with modern technology it is pasture, not water, that is limiting and this must be intensively managed. To be successful, pastoralists will need training to understand concepts such as 1) active management of boreholes, 2) concepts of dynamic carrying capacity linked to highly variable rainfall and 3) temporal/spatial relations to water in the non-equilibrium savanna systems of Sub-Saharan Africa. This will require integrating modern range management concepts into traditional pastoral management systems with flexible boundaries. A key to success appears to be selecting youth from these rural communities and sending them off to learn modern management principles [e.g., estimating carrying capacity (wet versus dry season), identifying and understanding the concept of increaser/decreaser plants, borehole management linked to habitat management, resource monitoring]. In many instances, it may require relearning traditional knowledge. Afterwards, they must be placed back into their community, where they will integrate this training into traditional management and control systems. With regards to wildlife, South Africa has made a number of mistakes and a number of corrections in terms of managing wildlife around watering points. There are many lessons to be learned by the rest of Africa from South Africa as regards developing relationships with parks and protected area management staff and academic institutions.

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Chapter 7

7.0 IMPACTS OF DAMS ON CONSERVATION AND DEVELOPMENT IN SUB-SAHARAN AFRICA

What is an African dam (Adams, 2000a)?

- “It is a dam which harms the livelihoods of river-dwellers; most African rivers have floodplains, and losing the annual flood below the dam is a disaster for traditional floodplain farming, fishing and grazing.
- It is a dam, which yields few compensatory benefits to peasant farmers; smallholders on irrigation schemes often find themselves unable to afford the extra costs of irrigated farming, and rent out or sell their land.
- It is a dam whose short-term gains to the national economy, through commercial farming of import-substitution crops or the production of electricity for industrial purposes, are elusive for want of a substantial entrepreneurial class.
- It is a dam built in countries where the institutions of civil society are weak, with no strong tradition of farmers’ organizations or non-violent protest” (Adams, 2000a).
- “It is a dam the only clear benefit of which, paid for dearly, is to shore up State prestige, so that dam critics in Africa do well to learn a verse from the Rubaiyat of Omar Khayyam: ‘When the King says it is midnight at noon, the wise man says behold the moon’ ” (McCully, 1996 *In:* Adams, 2000a).

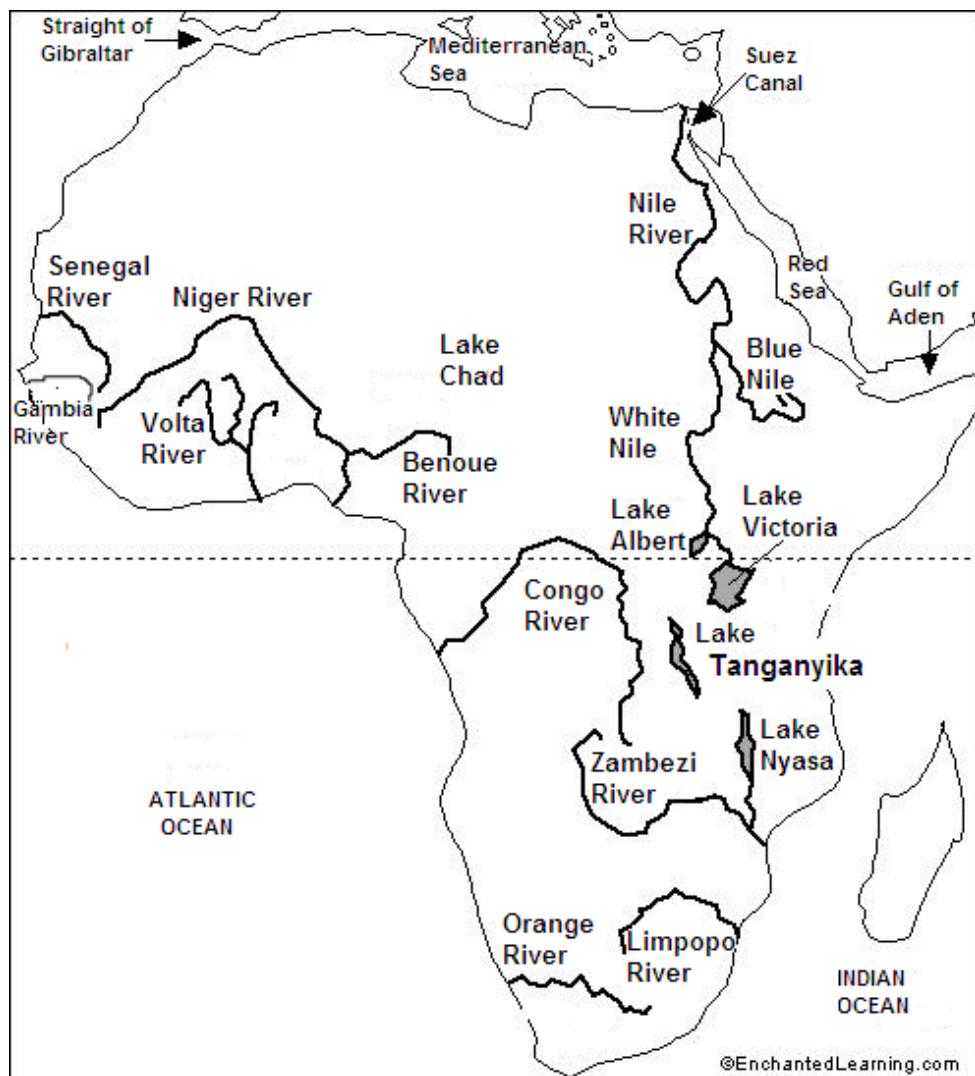
The net result of foreign aid and dams on the Senegal River “ ‘has enriched foreigners, entrenched corrupt states and alienated peasants’ ”. For the same amount of money, 200 small dams could have helped agriculture develop in 40,000 villages from Senegal to Chad (Dumont¹¹⁵ *In:* Rosenblum & Williamson, 1987).

¹¹⁵ René Dumont quoted from A Very Bad Finish

“It is clear that in the case of Cahora Bassa there was no serious attempt to ecologically optimize the dam prior to construction...furthermore, after dam closure, proposals put forward by the ecological assessment team were not implemented and there has been no regular monitoring of the dam’s downstream effects during its lifespan. As a result, Cahora Bassa has the dubious distinction of being the least studied and possibly least environmentally acceptable major dam project in Africa” (Bernacsek & Lopez 1984, Report to the U.N. Food Organization *In: Zambezi Valley News* 2003b).

According to the U.N. in 2000, worldwide, more than a billion people lacked access to clean drinking water and 2.5 billion had inadequate sanitation. Preventable water-borne diseases killed 10,000-20,000 children a day. Two billion people lacked access to electricity. More than half of all deaths from natural catastrophes were from natural floods. By 2050, there will be an additional 1.3-4.7 billion people, with many ecosystems already out of balance and unable to sustain the existing human populations (McCully, 2001).

While the African continent has only 11% of the runoff in the world (Figure 7.1), it has 13% of the human population, about 780 million people in 53 countries. As we enter the beginning of the 21st century, about 300 million people live in water-stressed countries, lacking sufficient water to meet basic human needs (see Chapter 13.11, AFRICA’S POTENTIAL WATER WARS). United Nations projections are that by 2025, 1.1 billion people or 75% of Africa’s population will be without adequate water. In Africa, the 60 international river basins shared by two or more countries make up 62% of the continent’s surface area, the highest percentage on any continent (Hitchcock, 2001 *In: Miller, Cioc & Showers, 2001*).



Modified from: Enchanted Learning (2007) with permission, Enchanted Learning.
Figure 7.1: Major rivers of Africa

With erratic rainfall, short rainy seasons and long dry seasons being typical of the majority of Africa's savanna lands and deserts, dams to store water and produce hydropower would seem to be the way to go, just as in the United States. The following provides an overview of dam development in Africa. It shares with the reader both the politics of dam building – much of which is tainted and destructive - and the environmental consequences of dams in Africa on the

people, their traditional production systems and the ecology. The big question is identifying the benefits versus the costs, especially to the environment, traditional food production systems and society, most of which have been ignored. The principal author's personal experiences are highlighted from having worked in river basin planning from 1977 to 1988 on both the Senegal and Gambia River Basin development schemes and peripherally in the Lake Chad Basin. The case study of the Senegal River is summed up in DeGeorges & Reilly (2006a; 2006b), while that of the Gambia River in DeGeorges & Reilly (2007).

It is hoped that this chapter will help change the West's approach to how it is dealing with the "Dark Continent", especially the politics and "plundering mentality" behind dam construction to date in Africa. At the same time, African decision makers must wake up to the reality of what dam building has done to their food production systems, their economies and their people. These monuments to modern technology have more often than not become legacies of failed governance and greed.

7.1 BIG DAM ERA IN THE WESTERN UNITED STATES

The first World Commission on Dams (WCD) report concluded that there were between 45,000 and 48,000 large dams in the world. All but 5,000 were built since 1950. A large dam is defined as measuring 15 meters or more in height from foundation to crest on the dam face – taller than a four-storey building. The world rate for dam commissioning peaked at 5,400/decade in the 1970s but has since fallen to just over 2,000. Peaks for dam commissioning were the 1960s in Europe and North America, 1970s for Asia and South America and the 1980s for Africa. It was estimated that during the 20th century, US\$ 2 trillion was spent on dams, the expenditure on large dams being between US\$ 32-46 billion/year in the 1990s.

On average, dams cost 30% more to build than projected. Benefits were found to be exaggerated (WCD, 2000; McCully, 2001):

- Of 63 large dams with hydropower, 55% generated less power than projected.
- The 58 irrigation dams assessed fell short of targets in area irrigated.
- Only 70% of irrigation area targets were met after five years and only 75% of the targets were met after 15 years.

The average cost overrun of the 81 large dam projects included in the WCD Cross-Check Survey was 56% (WCD, 2000).

In the dry western United States, in half a century, the Bureau of Reclamation alone built 355 dams with reservoirs, 254 diversion dams, 41,440 km (16,000 miles) of canals and 53 hydro plants (Ward, 2002). By 1962, nearly all of the major rivers of the United States – long reaches of the Mississippi, the Snake, the Columbia, the Illinois, the Missouri, the Sacramento, the Susquehanna, the Red, the Delaware, the Tennessee, the Apalachicola and the Savannah had been dredged, realigned, straight jacketed, rip rapped, diked, levied and stabilized for both flood control and navigation by the U.S. Army Corps of Engineers (Reisner, 1986). By the time it was all over, there were about 5,500 big dams and more than 2 million smaller ones in the USA (Ward, 2002), 99% built in the 20th century and just about all built by the Bureau and U.S. Army Corps of Engineers. Most of these dams, dikes and channels were subsidized, along with water, by the U.S. Government (Reisner, 1986) (see Chapter 12, Section 12.2.4.2, Agricultural subsidies, America's Agricultural Subsidies).

7.2 END OF THE BIG DAM ERA IN THE WEST

By the 1990s, environmental and social activists, as well as economics (construction costs as well as mitigative/opportunity costs of adverse social and environmental impacts) had all but ended the building of big dams in northern countries (McCully, 2001). Subsidized dams built by the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation for irrigation and hydropower had opened up the west of the United States, though many question their sustainability (Reisner, 1986). In America, President Ronald Regan in 1981 was the first to stop federal subsidies for dams, signing a bill to de-authorize 7 dams that would have cost the taxpayer US\$ 2 billion. By the time William (Bill) Jefferson Clinton took office in 1991, budget cuts and environmental laws all but killed big dams in America (McCully, 2001).

7.3 ECONOMIC RETURNS FROM BIG DAMS

On average, large dams are marginally economically viable. Multipurpose dams (e.g., more than one use such as irrigation, hydropower, navigation) are even less viable. The hidden long-term environmental and social costs when factored into costs and benefits make dams even less economically viable (McCully, 2001).

7.4 PEOPLE AFFECTED BY DAMS

As a result of the First International Meeting of People Affected by Dams, The Curitaba (Brazil) Declaration of 1997 called for an international independent commission to conduct a comprehensive review of large dams. The “Gland Agreement” of April 1997 laid the basic foundation for establishment of an independent “World Commission on Dams (WCD)”, first chaired by Kader Asmal, then the South African Minister of Water Affairs and Forestry (McCully, 2001).

In its Millennium Declaration, the General Assembly of the United Nations declared that the unsustainable exploitation of water resources would be stopped and that water management strategies to meet national, regional, and local needs, with a particular focus on equity and accessibility to the poor, would be introduced. Two and a half years later, the global landscape remained littered with examples of social and economic devastation due to the inappropriate management of freshwater resources and specifically, though not exclusively, the continuing development of large dams. The problem of access to water, food and energy is not a question of availability, but of access and distribution (McCully, 2001). For example, ESKOM South Africa produces 60% of Africa's electricity of which 46% is used for industry, 28% in transport, 10% in households, 9% in mining and 7% in agriculture. Yet over 70% of South Africa's population in 1989 was excluded from the network even though there was no shortage of electricity. Similarly, in South Africa, urban blacks consumed 10% of the electricity consumed by urban whites (Huntley, Siegfried & Sunter, 1989). It should be noted that South Africa is attempting to address these disparities without bankrupting the country (see Chapter 13, Section 13.14, NEPAD).

Interestingly enough, as this book goes to press, it should be noted that beginning in the second week of January 2008, failure to upgrade and build new power facilities, as recommended, is resulting in load shedding, with major adverse impacts on everything from mining, agriculture, retail sales, traffic, hospitals, trains, electricity available to neighboring countries as Zimbabwe, Zambia, Mozambique and Botswana supplied by South Africa, capital expansion in industry to foreign investment - a problem that will not be resolved before 2013. A major reason (excuse) given is that by 2008, the government had doubled "the numbers of people with access to electricity to 71% of the population, particularly in black townships and informal settlements" (McGreal, 2008). This could adversely impact the target of 6% economic growth by 2010 (BBC, 2008).

All over Sub-Saharan Africa, hydropower bypasses the majority of the rural and urban poor, serving a few elite in urban centers and industry. Power lines pass overhead of the millions whose lives have been forever altered, usually for the worse, by displacement due to reservoir inundation zones and floodplain losses. Many people feel that large dams fail to result in equitable access and distribution of these needs (McCully, 2001).

As the age of dam building in the West declined, dam construction and consulting companies linked to Western donors ventured into the tropics as a means of keeping these dam building/designing companies afloat (McCully, 2001).

7.5 FUNDING DAM BUILDING IN AFRICA

The World Bank is the largest financier of dams in the world; in many cases despite the obvious non-compliance with the institution's own policies. The UN Food and Agricultural Organization (FAO) and the United Nations Development Program (UNDP) have played a major role in promoting large dams and irrigation schemes. The U.S. Agency for International Development (USAID) and the Department for International Development (DFID), (in the past called the British Overseas Development Administration - ODA) are other important funders and planners of dams, often in partnership with other donors and in association with the private sector dam lobby. There is another worrying emerging trend whereby straightforward project lending is being substituted by a web of indirect financing that benefits domestic financial intermediaries and local hydropower utilities (McCully, 2001). Corruption and rule breaking, human rights abuses and environmental degradation have often accompanied the development and construction of the world's major dams (McCully, 2001).

“The World Bank owes a debt to the many millions of people whose lives it has destroyed through the financing and construction of large dams. The World Bank has lent more than US\$ 60 billion

for 538 large dams, including many of the world's largest and most controversial projects. Bank-funded dams have displaced more than 10 million people from their homes and land, caused severe environmental damage, and pushed borrowers further into debt. Despite its role in establishing and funding the World Commission on Dams (WCD), the World Bank has refused to implement the Commission's recommendations" (IRN, 2001a).

The World Bank's senior water advisor, South African John Briscoe, actively lobbied Southern governments to reject the findings of the WCD (2000) report (Bond, 2002).

7.5.1 Lesotho Highlands Water Project (LHWP)

Bond (2002), contends that the World Bank's recent funding of the Katse Dam, Africa's highest dam at 185 meters, as well as the Muela and the Mohale Dams, all completed by 2001, with another three to four dams¹¹⁶ in the planning phase as a part of the Lesotho Highlands Water Project (LHWP) (IUCN, 2002) to provide water for the Johannesburg-Pretoria area, "is a costly, corrupt, poorly-designed, badly-implemented, economically-damaging, ecologically-disastrous and distributionally-regressive megaproject" (Bond, 2002). The World Bank loaned \$150 million to the project to Phase IA (Katse and Muela Dams) in addition to loans from many other sources (IRN, 2000a).

In 1999, there was a court case in which 12 of the construction companies building the dam were charged with bribing the head of the project. At least six of the companies – from Switzerland, France, Italy and Germany – were linked to previous dam corruption scandals (IRN, 2000a). In 2002, the chief officer of the Lesotho Highlands Development Authority (LHDA) was sentenced to 18 years in jail (Bond, 2002; Transparency International, 2005). Over a nine-year period, he

¹¹⁶ Phase 2 pre-feasibility studies began in October 2005 (Engineering News, 2005), which includes the Mashai Dam scheduled for completion in 2007 (Engineering News, 2005) or 2008 (IRN, 2005).

received 46 bribes by multinational corporations for agreeing to “further their interest” (Bond, 2002).

“Following the conviction of LHDA’s CEO in June 2002, companies from Britain, Canada, France, Germany, Italy, South Africa and Switzerland were due to go on trial. The South African provincial government of Gauteng subsequently announced that, ‘if found guilty of bribery’, the companies concerned – which included major civil engineering groups in South Africa – would be disqualified from bidding for contracts in a proposed metropolitan railway” (Transparency International, 2003).

IRN (2005) lists the names of the companies and the alleged bribes. “The Lesotho High Court found in September 2002 that Acres International paid 681,316 Canadian dollars (US\$ 431,339) into Swiss bank accounts for the former head of the Lesotho Highlands Development Authority, Masupha Sole, between 1991 and 1998” (Mail & Guardian, 2005). People displaced by the LHWP dams are poorer because of so-called progress. Often compensation packages are late or not paid at all. “Each resettled family receives between 800 (US\$ 126) and 2,000 rand (US\$ 314) a year, and some say they have had to withdraw children from school as they are unable to feed themselves. Some say they no longer have land on which to bury their dead” (Lekhetho, 2005).

“Two of the Lesotho firms were involved in a Kenyan dam in the 1980s, which cost twice what it should but was approved because of bribes to the President and energy minister. Three firms were involved in the \$3 billion Yacyreta dam on the Paraguay-Argentina border, which had \$460 million in World Bank loans. In 1990 Argentine President Carlos Menem called the dam a ‘monument to corruption’. But it was built in the era of northern support for the military dictatorships of Latin America, and the World Bank turned a blind eye. Some of the money went into foreign bank accounts, while some went to the Argentine military. Some World Bank staff call Yacyreta ‘the dam that financed the Falklands war’ ” (Hanlon & Pettifor, 2002).

“According to one recent estimate, between US\$ 26 billion and US\$ 130 billion (5–25%) of the US\$ 525 billion lent by the World Bank since 1946 may have been misused or lost to corruption. The World Bank contests this estimate” (Transparency International, 2005). High levels of corruption in multinational development banks (MDB)-backed projects have been blamed on several factors, which include weaknesses in the MDBs themselves; institutional “pressure to lend”, with an emphasis on the quantity rather than the quality of projects, and weak internal controls at the banks, particularly in the supervision and auditing of projects (Transparency International, 2005). Bond (2002) believes that alternatives to dams in Lesotho would have been:

- Repairing faulty water distribution pipes in South Africa that result in the loss of 24-40% of the incoming water.
- Incentives to use water conservative toilets and showerheads.
- Pro rata tariffs as water consumption (industry, agriculture, middle and upper class in suburbs) goes up, to help subsidize water to the poor and to encourage water conservation.
- Convert farmers who use 50% of South Africa’s water to more efficient irrigation systems (e.g., drip irrigation) (see Chapter 5, Table 5.32: Water productivity gains when shifting from conventional surface irrigation to drip irrigation).

To cover the costs of these dams, the poor saw water tariffs increase by 30% and being unable to pay, many residents in the Gauteng townships of South Africa saw their water supplies cut by the municipalities. Thus, this “development” mainly benefited mines, industry and the middle-upper class suburbs to the detriment of the poor.

Thamae & Pottinger (2006) provide an excellent overview of the social and environmental consequences of the Lesotho Highlands Water Project. A recent study by Bosshard, Bruij, Horta, Lawrence and Welch (2003), “Gambling With Peoples Lives”, provides an overview of the World Bank’s debacles “High

Risk/High Reward Strategy”, a high risk for the environment and local people and great rewards for the consulting firms and construction companies from America and Europe. They are concerned that the Bank is returning to mega-projects such as big dams and that an “approval culture” in which appraisal becomes advocacy without adequate environmental and social analyses to assure minimum adverse impacts is becoming the norm. According to Transparency International (2005), “since 2003 the World Bank has started to re-prioritize infrastructure, and is set to increase its infrastructure lending from US\$ 5.4 billion to US\$ 7 billion by 2005”. On the positive side, the World Bank has begun the practice of debarring companies found guilty of fraud and corruption. The question that must be asked is, “How does this relate to misleading environmental assessments that lead/have led to ecologically and socially destructive projects, and will this be looked at retroactively”?

Dams do not have to be economically viable, since many of these loans to developing countries will be written off in five years. The dams are built and make a profit for international engineering and consulting firms, which do not bear the consequences if the objectives of the dams are not met or if the environmental and social impacts are negative. They return to their countries that much better off, often leaving behind a trail of destruction. The World Bank and other donor agency bureaucrats are promoted by moving large sums of money. Unlike private banks or commercial private sector investors, they have little incentive to assure that the outcomes are economically sustainable. In essence, foreign aid is political money (a small percentage of the developed world’s GNP/GNI, but a lot of money for the developing world), which is usually loaned to governments, who are rarely able to pay back their loans (see Chapter 11: “INDEPENDENCE”, “DEMOCRACY” AND FOREIGN AID DEPENDENCY, IMPACTS ON CONSERVATION AND DEVELOPMENT and Chapter 12, Section 12.5.3.1, Debt relief creates more debt).

Government officials in most borrowing countries use this dam money to feed political patronage systems and large procurement contracts may offer opportunities to siphon off funds. An important step that the World Bank must take to make good on its environmental and social claims is to release its staff from the pressure to move money quickly and reward them on the basis of the long-term beneficial impacts of their projects. Unfortunately, as the bank is expanding into the former communist countries and into the new field of so-called environmental projects, there has been little movement in this direction (Horta, 1994).

7.6 CONTRIBUTION OF DAMS TO FOOD PRODUCTION AND NUTRITION IN AFRICA

Of an estimated 270 million ha of irrigated land worldwide, about 30-40% is watered from dams. Dams contribute 12-16% of world food production, not the 33% purported by the dam industry. In Africa, when traditional “irrigation systems” such as recession agriculture on floodplains are accounted for, land under irrigation increases by 37%. FAO estimates that nearly 50% of the 5 million ha irrigated in Sub-Saharan Africa (see Chapter 5, Section 5.12.1.3, Irrigation potential) receives water from small- scale and traditional systems (McCully, 2001).

7.7 RIVER BASIN PLANNING AND DAMS IN AFRICA

The construction of the Kariba Dam on the Zambezi River in the 1950s ushered in an era of big dam building on the African continent. Most large dams in Africa were built on the U.S. Army Corps of Engineers’ “Integrated River Basin Planning Model”, epitomized by the creation of the Tennessee Valley Authority (TVA) in 1933 and the adoption of the TVA model by the United Nations in 1958

(Hitchcock, 2001 *In: Miller, et al.*, 2001; Ward, 2002). The idea was to approach river basin development in addressing the multifaceted development needs in an integrated manner. This was done by addressing the electricity, urban and rural development, navigation, agricultural, fishing, recreational and cultural needs of the people living within these river basins.

The problem is that many of these integrated river basin programs, based on big dams, became heavily politicized, either being show pieces in host-countries for politicians, big money for consulting firms and construction companies with large kick-backs to decision-makers, or part of the Cold War agenda of buying friends in the short-term regardless of the consequences to people or the environment. The result was that technical issues, especially both long-and short-term environmental and social consequences, were ignored and/or dealt with at a very superficial level. The idea was not a question of “will the dams be built”, but that they would be built at all costs regardless of how many human lives would be adversely impacted or how seriously traditional production systems (ecosystems) would be degraded. Mitigation was minimal if at all.

Very often, dams destroyed the lives of low-income people and often, “key benefits” such as electricity and irrigation benefited large corporations and wealthy households, but not the urban or rural poor (*Miller, et al.*, 2001).

It is believed that dams may be necessary, but technical as opposed to politicized planning and decision-making must be at the core of the selection process. This is necessary in order to assure that the most appropriate dam scenario is funded, which minimizes adverse short- and long-term impacts on the environment, permits adequate mitigation where critical to the survival of natural systems and the people who live from them, and which meets strategic development

objectives. Unfortunately, this has not been the history of dams in Sub-Saharan Africa to date.

Can this change; will Africa move forward? Is there a moral conscience in the 21st century, which will push the global community to help develop Africa as opposed to continually plundering its resources, making it vulnerable to economic manipulation to the benefit of the West?

The following (see Section 7.7.1, Planning at a Political Level, Section 7.7.2, Planning at the Technical Level Compromised by Political Agendas, Section 7.7.2.1, History of environmental planning in America and Section, 7.7.2.2, Africa is where the USA was prior to WWII) is taken from a presentation by the principal author at an IDEP¹¹⁷ conference on river basin development in Dakar, Senegal (DeGeorges, 1986). The principal author worked in the field of river basin planning in Africa from 1977 to 1988, on the development of the Senegal River, Gambia River and Lake Chad Basins. The basic premises are as true today as they were back in 1986.

7.7.1 Planning at a Political Level

Planning for agricultural development in river basins has been based primarily on an unrealistic goal of “food self-sufficiency”. Current and future population numbers have been projected. The quantity of food needed to feed these populations was estimated without much regard for the cost of achieving this goal or as to whether food security¹¹⁸ might be a more achievable goal. In turn, these

¹¹⁷ The United Nations African Institute for Economic Development and Planning, Headquartered in Dakar Senegal

¹¹⁸ Food Security in a global society assumes that a country uses its comparative economic and ecological advantage over the rest of the world to generate wealth, which could be food crops, but may also be timber, tourism, safari hunting, and transformation of natural resources (e.g., oil, timber, minerals, agricultural products) through industrialization. The idea is that if rice is cheaper to produce in Asia compared to West Africa, then West Africa will not try and take part in a losing

food projections were converted into the quantity of agricultural land needed to be placed in production over time in order to achieve this goal. Little effort was made to review the economic, social and environmental costs of attaining this production. Often the rate of programming this land into high tech irrigation production was unrealistic. The foundation stone of the pyramid needed to assure the success of such an undertaking, the rural community, was rarely consulted. The achievement of food self-sufficiency relied primarily on a very narrowed source of food production, primarily irrigated rice, in preference for better management of more diversified traditional food production systems (e.g., floodplain recession agriculture, rainfed agriculture, fisheries, forage, and wildlife) (DeGeorges, 1986; McCully, 2001).

Because emphasis was placed on one major agricultural system, the decision-makers tended to disregard those natural systems, which traditionally had been a major source of food, energy and economic livelihood for rural people. Many of these natural systems, already degraded because of drought and pressure from an ever-increasing human population and their associated domestic livestock, risked to be eliminated and/or highly degraded as a result of the level of political planning. In many instances, expensive and often uneconomical infrastructure (e.g., dams, large-scale irrigated perimeters) was attached to the goal of "food self-sufficiency".

Because rivers know no boundaries and because regional river basin development commissions have been established to coordinate development mandates of the commissions' member states (countries that have all or a portion of their political boundaries within a given river basin), these infrastructure projects often became much politicized. Instead of finding the most efficient, least expensive way of

competition that could and has destroyed much of its natural resource base/traditional production systems as on the Senegal River. At a minimum, irrigated rice should not be at the expense of traditional food production systems, but should compliment them.

development, which presented the smallest risk to the basin's residents and their renewable resource base, up until recently, most water resource development has been selected with a goal of modeling itself along the lines of agro-business style irrigated agriculture, as in the western United States and to a lesser degree in Europe. This has often been through inefficient government parastatals that have catered to the political elite rather than the small farmer.

Often financing and long-term recurrent costs of subsidizing this type of development by governments was overlooked. This often meant expensive dams for each country. Many developing countries are experiencing severe economic crises and are unable to pay back outstanding loans. Ever increasing human populations, many growing at 2-3% per year even with HIV/AIDS, combined with severe and unpredictable climatic conditions (e.g., continual cycles of drought in the Sahel) and ecosystems (e.g., savanna making up 70-75% of Sub-Saharan Africa – see Chapter 5) meant to sustainably support low population numbers (e.g., migratory pastoralism, slash and burn agriculture with long fallow periods lasting from a few years to as high as 20 years) are straining the already suffering economies and forcing donor agencies to take a closer look at how they are spending the little money they have for “development”.

7.7.2 Planning at the Technical Level Compromised by Political Agendas

Because river basin development organizations were established to carry out the political mandates of their member states, planning at a technical level has been met with resistance. They are often linked to international lending institutions and consulting/engineering firms with many kickbacks at all political levels, both nationally and internationally.

Planning units within river basin development organizations have been expected to plan within the realms of the political objectives established by the member states, whether these objectives are realistic or otherwise. Since normally a political solution has been selected, the planning unit is expected to justify this political decision and to study mitigative measures, where possible, to natural and human-made systems, which may be degraded or lost because of the proposed development project.

John Waterbury's (1979) *Hydropolitics of the Nile Valley* best sums up this problem:

“One of the gaps policy-makers have generally failed to bridge is also one that policy analysts have failed to bridge. It is the separation of the criteria for adoption of specific technologies from the criteria guiding the political and economic decision-making process. National policy-making elites are generally preoccupied with the latter, and they expect the technocrats to adapt their needs to the political decisions taken without regard to technological opportunity costs. Seldom do these two groups speak each other’s language. Seldom do they clearly perceive that close interaction of their two spheres, that a political decision may determine the adoption of a certain technology but once adopted that technology will then determine subsequent decisions...The result, both in terms of the decision-making process itself and the analysis of that process, has been a fragmented and incomplete picture in which many interrelationships are left unexplored. In this situation one cannot properly assess cause and effect, and that after all is what the exercise is all about. It may well be the case, and indeed in the conclusion we so argue, that policy-making groups and external creditors prefer an incomplete picture for then unanticipated errors can be written off to incomplete information and poorly defined responsibilities”.

The idea of planning at a technical level for river basin development was relatively new to Africa back in the 1970s and 80s. To a large degree, politics appears to continue taking precedent over technical concerns even in the 21st

century, (e.g., the Bujagali Dam at Jinja, Uganda - origin of the White Nile - Basalirwa, Babirye & Kidega 2000; IRN, 2000b); the Epupa Dam on the Cunene River (a wild and scenic river) along the Namibia/Angola border (IRN, 1999), the Namibian pipeline to extract water from the Okavango River upstream to supply the growing population in Windhoek, threatening the future of the Okavango Delta and the 6 meter high and 1 km wide Popa Falls Hydropower Plant less than 50 kilometers upstream from the Okavango Delta in Botswana (IRN, 2000c).

7.7.2.1 Africa is where the USA was prior to WWII

Africa, with the exception of South Africa, is where America was in the 1960s (highly degraded resources) and pre-WWII with regards to education. As in the United States in the 1960s, there is a growing awareness that the basis of Africa's economies and the life blood of its people, the natural environment, is being degraded as a result of both natural (drought – though this alone would be temporary) and human-made phenomena such as deforestation, over-grazing, mono-culture, decreased fallow periods, farming steep slopes, uncontrolled poorly thought out fires often late into the dry season and indiscriminate poaching of wildlife and fish stock.

Where the population of America organized to combat the degradation of their natural resource base, in Africa the population is not adequately organized, possibly fails to comprehend the global picture of what is happening and/or is alienated from centralized conservation policies (see Chapters 3-6, 9 and 11).

For the moment, the brunt of responding to and planning to overcome a continent-wide crisis falls on the shoulders of Africa's educated minority and the global community. The question is, "Do enough people care to make a difference"? The

power of public interest groups, such as the nascent Green Belt Movement of Kenya, will come later with a more educated populace.

7.7.3 Environmental Impact Assessment (EIA) Industry – No Hippocratic Oath

“The track record of EIA (Environmental Impact Assessments) for dams is dismal although it is not clear if there are few good examples or everyone writes about the bad ones” (Sadler, Verocai & Vanclay, 2000).

There are number of definitions for environmental assessments. For the purpose of this document, the following are discussed:

- **Environmental Impact Statements (EIS)** in which a “no action alternative” is compared to an often “politically preferred alternative”, along with a number of alternatives whose environmental, social and economical impacts are projected over a 20-50 year planning horizon and whose opportunity costs are determined (e.g., the additional cost required to achieve a given level of environmental or social protection such as controlled flooding).
- **Environmental Assessment (EA)** in which there is only one planned action, which is assessed for positive and negative environmental and social impacts. Only mitigation of negative impacts and enhancement of positive impacts is permitted. There is no comparison against a no action alternative or other development options, as often a decision has been made at a political level to go ahead regardless of the consequences.

Verocai (2000) states that most environmental assessments concerning dams in the early 1970s were as “EAs” undertaken at the request of International Finance

Institutions (IFIs), namely the World Bank, since the decision to build the dams had already been made, often in opposition to local and foreign environmentalists and scientific groups.

It is argued that although EIA (EA) procedures have improved,

“the effectiveness of EIA (EA) of dams in developing countries is that, in the great majority of cases, project proponents still consider the EIA (EA) process as a bureaucratic requirement to be fulfilled for project approval, isolated from the project planning and implementation cycle. EIA (EA) studies are often carried out after the decision on the site of the dam has been made and engineering studies and projects have been completed. The choice of site of a dam is usually determined by economic and engineering criteria, with little or no consideration for environmental (or social) issues. As a consequence, the opportunity is lost for considering dam site alternatives with less damaging environmental and social impacts” (Verocai, 2000).

There is little or no consultation with basin residents who will be directly or indirectly impacted by the dam (e.g., displaced within inundation zone, or farmers, herders, fishermen, etc. whose natural resources will be adversely impacted from loss of downstream flooding). Civil society is usually disorganized, unaware and often powerless in the face of what is happening until after the fact.

The two major case studies discussed in this chapter can be classified as follows. The Senegal River Basin environmental study was an EA, while the Gambia River Basin study started out as an EA and turned into an EIS as it became evident that the planned dam development scheme would be ecologically, socially and economically catastrophic to the basin.

The mandate for environmental planning must come from legislation passed by African countries. Since the 1970s, many countries have adopted various forms of environmental laws and have become signatories to many international environmental treaties. The problem today in river basin planning and in conservation and development is often not a lack of legislation but a lack of political will and the desire to make a quick profit. This can be on the part of national/local politicians or even international bodies/corporations. There are no innocents and many guilty parties in the environmental assessment and dam building fields for a number of reasons from Cold War politics in the past, to greed.

Until African countries are willing to apply proper environmental assessment techniques as part of their planning and decision-making process, real development will be put off for years. This will and is occurring, because in pursuit of achieving a quick-fix political solution to their problems, African countries and their people are being taken advantage of by the very political elites who run the countries, as well as expatriate and local entrepreneurs looking to make a quick profit with little regard for the consequences of their actions.

There is no Hippocratic Oath in the consulting industry. Environmental Impact Statements (EISs) and Environmental Impact Assessments/Environmental Assessments (EIAs/EAs) are often closely linked to Western Donors and consultants and consulting firms looking for their next contract. They feed the funding donor and host country politicians what they wish to hear; the justification of the development program and the spending of donor money. Since foreign aid is more political than developmental, there are no consequences for development failures, only for failure to move the money. After spending hundreds of thousands, if not millions of dollars, the last thing a donor wants is

for the “no action” alternative to come out as most desirable. This would make the donor bureaucrat look very foolish.

In turn, the dam lobby from the donor countries; engineering construction and consulting firms often heavily influence the donors. Often, there is no external review of these environmental assessments, which are self-serving with kickbacks to local politicians and even donor bureaucrats (McCully, 2001)

Thus, many consultants and consulting firms become highly paid scientific “prostitutes” in a capitalist system. Morality, ecosystems and people’s lives are important, as long as they do not get in the way of the bottom line - profits. McCully (2001) calls it the “EIA industry”.

The ultimate decision as to whether to go ahead with such a project is often more political than ecological or economical. In Sub-Saharan Africa, planning is top-down. There is no consultation of the local populations. Rather, these decisions are made by bureaucrats and politicians looking to further their careers and to benefit from lucrative local contracts and other kick-backs, and whose lives will be minimally impacted regardless as to whether the long-term consequences prove to be beneficial or not to local communities.

An often used argument is that the West destroyed much of its environment in developing and not until it reached a certain economic state did it begin to develop environmental conscientiousness. While this may be true, much of the Third World is rural and resource dependent, river arteries and their associated habitats being vital to their survival (McCully, 2001). These rural people cannot afford to degrade their natural resources deliberately, as their survival depends on their sustainable use.

If true mitigation of environmental and social consequences or irreversible unmitigative adverse impacts were costed into the cost/benefit analysis of many dams, they would never be built. This is the reason why as big dam building moves out of the public sector arena into the private sector arena, private investors are less than hungry to fund such projects (McCully, 2001). The only dams likely to be built on purely a private sector basis in the near future are small to medium-size run-of-river hydrodams. Large multipurpose dams such as the Aswan, which rarely fulfill all of their objectives, are even less appealing to investors than hydro-only dams.

High technology such as irrigation also has high initial costs such as construction, pumps, tractors, dams and tile fields where soil salinization is a problem, and high recurrent costs such as fertilizers, pesticides, spare parts, canal and perimeter maintenance. To date, these technologies have not proven that alone they are the solution to a cost-effective means of increasing food production and development (see Chapter 5, Section 5.12.1.3, Irrigation potential). They may compliment traditional production systems, but no one should be naïve or selfish enough to think that they can replace them with dams and irrigation.

The traditional production systems based on the renewable natural resource base are basically free and self-perpetuating if rationally exploited. They often provide a higher quality, wider variety and more nutritional source of food than irrigation that tends to be based on the mono-culture of rice. The roll of the modern day planner/technician should be to assure compatibility between the old and the new, between traditional and high tech. Natural systems management both compliments and becomes an alternative/escape in case either for technical, ecological or economic reasons, high tech proves unfeasible or takes longer to implement than is currently planned.

This is not to say that the status quo is acceptable. Africa's rural population is out-of-balance with the ability of its ecosystems to provide them with a sustainable livelihood, and remedies must be sought. However, the elimination of these traditional production systems through poorly thought out development plans and displacement/elimination of these traditional ecological and production systems by high technology that has yet to prove sustainable is also not the answer.

With this in mind, the following section looks at dams on African rivers, mistakes that were made, how planning might help find appropriate dam options, and how politics, nationally, regionally and internationally is often an impediment to proper planning.

7.7.4 Politics of Justifying Dams on the Senegal River

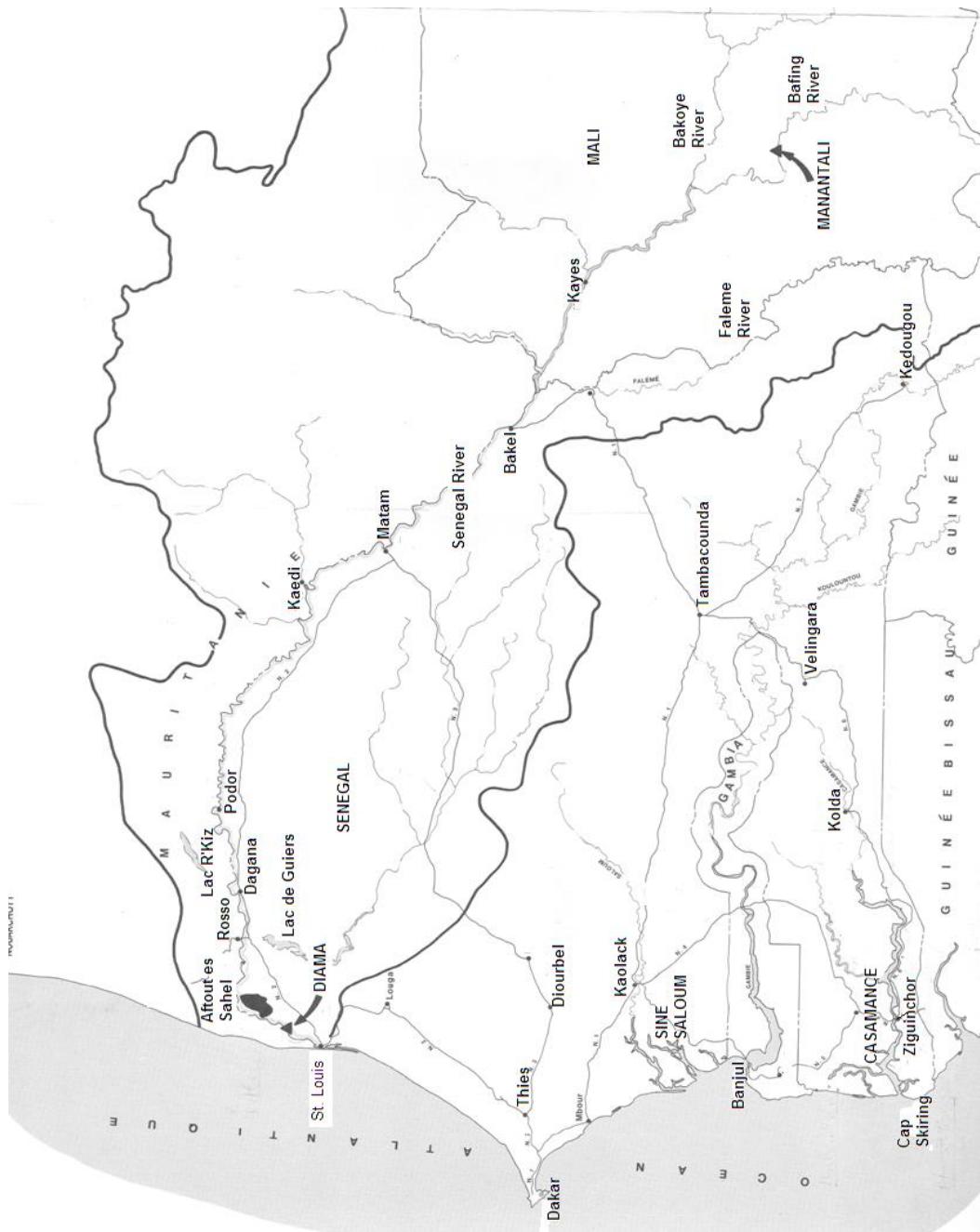
From 1977-1980, the principal author was brought in at the final stage of the Senegal River Basin Environmental Assessment awarded by USAID as a host country contract through the Senegal River Basin Development Organization/*Organisation pour la Mise en Valeur du Fleuve Sénégal* (OMVS) to the engineer consulting firm Gannett Fleming Corddry & Carpenter (GFCC).¹¹⁹ He first participated in putting together the water quality and fisheries reports (GFCC, 1979; 1980a) and then played a major role in putting together the final reports of the synthesis (GFCC, 1980b) and plan of action (GFCC, 1980c). From 1982-1988, he served as environmental advisor to the Gambia River Basin Development Organization/*Organisation pour la Mise en Valeur du Fleuve Gambie* (OMVG). The Senegal River is a floodplain ecosystem. The Gambia River relies to a lesser degree on floodplains and more on an extensive mangrove

¹¹⁹ Currently, Gannett Fleming Inc., 207 Senate Avenue, Camp Hill, Pennsylvania 17011, administration@gfnet.com, www.gfnet.com

ecosystem for its productivity. These river basins were the U.S. government's first large-scale environmental assessments in Africa. On the Senegal River, as the annual flood receded, hundreds of thousands of traditional farmers planted sorghum and millet, fishermen fished and nomadic pastoralists grazed their livestock along the river's floodplains.

The Senegal River Basin Environmental Assessment was a contract amounting to about US\$ 3.7 million (DeGeorges, 1980), sending multi-disciplinary teams of American engineers, agriculture, fishery, wildlife and public health specialists into the field to assess the impacts of planned dam development on the Senegal River. Hydrological modeling was undertaken to create artificial floods under various flow regimes once dams (Figure 7.2) were in place, as a means of maintaining freshwater and estuarine fishing, dry season forage and recession agriculture. The principal author was first brought in about two-thirds of the way through the study to work with the team assessing the impacts of the dams on the aquatic ecosystem, eventually being one of the key persons putting together the final project reports.

The Senegal River is the second longest river in West Africa, after the Niger River (4,200 km), with a length of 1,800 km and a watershed of 290,000 km². The upper basin in western Mali and Guinea-Conakry provides almost all of the river flow. No significant flows are added below the juncture with the Falémé River. Average annual precipitation is 2,000 mm in the headwaters (Guinean eco-climatic zone) and 250 mm in the northernmost area of the basin (Sahelian eco-climatic zone). The average annual discharge at Bakel, which measures accumulated flows from these headwaters, is 770 m³/sec. The average monthly maximum and minimum flows at Bakel are 3,500 m³/sec in September and 10 m³/sec in May (Gould, 1981).



Source: Gannett, Fleming, Corddry & Carpenter (1980c), USAID Public Domain

Figure 7.2: Dams in the Senegal River Basin.

The rainy season in the upper watershed traditionally occurs between June and October and results in downstream flooding between July and November.

Traditionally, flooding occurred primarily downstream of Bakel in the Middle Valley, an alluvial plain 10-20 km wide and in the delta, the lower 200 km of the river (Gould, 1981). During the flood period, the main river channel exhibited typical riverine (lotic) characteristics from the beginning of the rains until February. During this period of active flow, isothermal conditions were approached due to the complete mixing of the water column by turbulence. Sediment entering from runoff in the upper watershed was transported downstream, greatly reducing the penetration of light into surface waters.

During the dry season, the river was navigable to Podor, 320 km upstream from the river mouth (Gould, 1981). From the onset of the dry season in November until the beginning of the rainy season in mid-July, the lower portion of the river became increasingly estuarine as the salt tongue pushed upstream from the ocean to Richard Toll and sometimes as far as Dar es Salaam, 218 km upstream from the mouth at Saint-Louis and at times to the Doué Marigot at Podor. These waters were greatly influenced by tidal action. In February, from Kaedi upstream, the river began to develop lentic (lacustrine or lake-like) conditions. This ponding effect reached a peak in late June and early July just before the rainy season (GFCC, 1979; 1980a).

In the 1970s, the valley was to be *le grenier du Sénégal*, Senegal's granary (Adams, 2000b). However, the Sahelian drought of the 1970s resulted in the creation of the Senegal River Basin Development Organization/*Organisation pour la Mise en Valeur du Fleuve Sénégal* (OMVS) on March 11, 1972 by the governments of Mali, Mauritania and Senegal in order to promote irrigation, power generation and navigation in the Senegal Valley. The purpose of the high dam at Manantali in Mali and the Diama anti-salinity barrage – located 27 km upstream from the river's mouth between Senegal and Mauritania - was to

provide enough water to achieve the following development objectives (GFCC, 1980b):

- Irrigate 255,000 ha, according to GFCC (1980b); 185,000 ha in Senegal, 62,000 ha in Mauritania and 8,000 ha in Mali (GFCC, 1980d). Others use the figure of 355,000 ha (Bosshard, 1999) and even 420,000 ha (see Chapter 5, Section 5.12.1.3, Irrigation Potential). This latter figure is close to an average flood of 459,000-549,000 ha, as calculated by GFCC (1980b; 1980d);
- Produce hydropower (800 GWh [Gigawatt hours]/year)¹²⁰ (GFCC, 1980b);
- Make the river navigable all year round between Saint Louis at the river mouth and Ambibédi in Mali;
- Supply freshwater for *Lac de Guiers*, which is a source of the freshwater supply for Dakar, the capital of Senegal (Diop, Nakamura, Smith & Khaka, 2000);
- Availability of surface water for annual recharge of *Lac R'Kiz* and Aftout es Sahel in Mauritania; and
- A year-round flow of 100 m³/second in excess of irrigation and other requirements to provide water depths needed for navigation (GFCC, 1980b).

According to the GFCC (1980b),

“In July 1974 at the prospective donors meeting held at OMVS in Nouakchott, Mauritania, the U.S. Agency for International Development (USAID) proposed that a detailed evaluation be undertaken to determine the potential effects of the integrated development plan on the environment of the River Basin and its population. USAID felt that a balanced approach between the considerations of economic development and the protection of the environment must be considered by all potential donors to insure

¹²⁰ A kilowatt hour (KWh) is equal to a 1,000 watt light bulb for one hour. One GWh equals 1 million Kwh

that maximum long-range benefits would be derived from the OMVS development program. The early identification of adverse impacts would permit the application of corrective measures prior to the development of environmental damage... This proposal was supported by other prospective donors as well as the OMVS, who were anxious to avoid problems that have arisen in similar water resource projects in tropical and sub-tropical areas of the world”.

The objectives of the GFCC environmental assessment were (GFCC, 1980b):

- To evaluate the interrelated effects on the environment caused by development in the Senegal River Basin;
- To optimize the long-term benefits by insuring the environmental and social factors have been identified and included in the cost-benefit analysis of individual projects; and
- To provide the OMVS riparian states with a plan of action for formulating programs and projects that mitigate adverse environmental effects and capitalize on those deemed beneficial.

For the purpose of this environmental assessment, the Senegal River Basin was divided into (Figure 7.2):

- a) Lower Valley (Delta), which includes the zones of Dagana and Rosso to the river mouth.
- b) Middle Valley (*Moyenne Vallee*), which includes the zones of Podor, Matam, Bakel, Boghe, Kaedi, Selibabi and Kayes.
- c) Upper Valley (*Haute Vallee*), which includes the zone of Bafoulabe – basically upstream of Kayes.

In the Lower Valley, the term “Lower Delta” is used to discuss the estuary below the Diama Dam face 27 km upstream of the Senegal River mouth and the “Upper

Delta”, which could be described as from the Diama Dam face to the upper limit of the salt tongue which in the extreme went as far upstream as the Doué *Marigot* at Podor, 320 km upstream from the river’s mouth. The Manantali Dam is located in the Upper Valley in Mali, about 1,200 km upstream from the river mouth on the Bafing River, the main tributary of the Senegal River, which supplies approximately 50% of the annual flow of the Senegal River (GFCC, 1980b). Adams (2000b) estimates the Bafing to provide 60% of the annual flow of the Senegal River.

As will be seen, the GFCC environmental assessment, funded by USAID at about US\$ 3.5 million, did not lie about adverse impacts, but perpetuated the myth that pumped irrigation of rice and other agricultural products would offset the losses of the diverse array of traditional food production (e.g., estuarine and freshwater floodplain fisheries, recession agriculture, dry season forage for livestock and some wild foods) from modification of the natural systems by dams and irrigation. This was even though many within the organization, especially the project agronomist¹²¹ knew that pumped irrigation was neither economically nor ecologically viable. Salinization of the soils from irrigation and high saline groundwater tables would make the cost of pumped irrigation very high, if sustainable, making it cheaper to import rice from Thailand than to grow it in Senegal. Both USAID and GFCC staff were aware of this problem, but kept the myth going, thus justifying the construction of the dams and being as responsible as anyone for the catastrophe that followed (DeGeorges, 1987a). Thus, traditional production systems were eliminated, while the high technology introduced was not cost-effective, but international and local consulting firms, as well as some politicians became richer and individual careers advanced.

¹²¹ Walter Firestone, an old FAO hand in Africa

Diama was completed in 1986 and Manantali in 1988; both dams were inaugurated in 1992. Thus, they were built during a period when irrigated farming encountered increased difficulties: massive unpaid debts, an ecological disaster in the making in the delta (e.g., soil salinization on a massive scale) and irrigation schemes lying abandoned in the valley (Adams, 2000b).

7.7.4.1 Construction costs

Construction of the Diama began in 1981 and ended in 1986, while the Manantali construction went from 1982-1988, both being inaugurated in 1992 (Adams, 2000a). On the Senegal River, it is estimated that US\$ 784 million (98%) of the US\$ 800 million spent on the design and construction of the Diama and Manantali Dams went to expatriate firms. The loans to pay the dams came mostly from Arab Gulf states wishing to expand their influence in this Muslim area, France and Germany (McCully, 2001).

Construction of the Manantali Dam cost about \$500 million (Bossard, 1999). Adams (2000a) estimates that the cost of the two dams was US\$ 800 million. Funding was provided by several Arab governments, the Islamic banks and the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD), Italy, the French CFD, the German KfW (German Development Bank), the Canadian International Development Agency (CIDA) and the European Union (EU). The civil works contracts for the Manantali Dam were awarded to Ed. ZUBLIN (Germany) and Losinger (Switzerland). The World Bank declined to support the Manantali Dam, which it did not consider a reasonable investment, and stopped all funding to OMVS in 1979. USAID also declined to support the construction of the dam, but provided financial and technical assistance for environmental assessments that justified the dams and development scheme, and resettlement. This in turn provided justification for other donors to give funding

(Bosshard, 1999). The French constructed the Diamal Anti-Salinity Barrage (Dam).

The only beneficiaries were the American, French and German consulting and construction firms, along with some of the bureaucratic elite who were able to skim money. The USAID funded EA was a host country contract controlled by the OMVS. An audit by the firm, Arthur, Anderson & Gaye, which the principal author was involved in, showed money from the EA disappearing into the OMVS that could not be accounted for. There was rather good evidence, though never outright proof, that one of the OMVS officials was using project vehicles and money to run a taxi service. Soon after, USAID stopped “host country contracts” running their money through American consulting firms and NGOs.

7.7.4.2 Hydropower

The Manantali Dam was to produce 800 GWh per year of hydropower (GFCC, 1980b). In June 1997, despite serious environmental and socio-economic concerns raised by a host of critics, the World Bank approved a US\$ 38 million loan to help finance installation and operation of the dam's turbines. As noted, the bank was not a lender for the original construction of the dam. The plan was to increase power output at the expense of other uses, with hydropower having first priority when reservoir levels fell (Pottinger, 1997). Electricity from the Manantali would supply 52% of production to Mali, 15% to Mauritania and 33% to Senegal (Baxter, 2001) and was to be operated and maintained by ESKOM Enterprises of South Africa, which has a 15 year contract (Bond, 2002). Many are concerned that this spells the end of water being made available for controlled flooding to maintain ecological and traditional food production systems (see Section 7.10.7.1, Senegal River).

7.7.4.3 Navigation costs

One of the main purposes of the Manantali Dam was to regulate the Senegal River to allow barges to carry bauxite and iron 900 km from Kayes, Mali, to the sea. The cost of dredging and construction of over US\$ 400 million makes the likelihood of this ever happening very small (McCully, 2001).

7.7.4.4 Conclusion

As the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) points out, “social disparities and malnutrition” have appeared or increased among the affected people, and the rich Senegal Valley has become the poorest [area] in all three countries (Bosshard, 1999).

“The tragedy of the Manantali project did not come as a surprise. Independent observers predicted many of the negative impacts, which have materialized in the meantime. The World Bank consciously declined to get involved in the funding of the dam (though it did fund the hydropower), and temporarily stopped funding OMVS in 1979 as a consequence of the ill-conceived project. Eugene Brantly and Karen Ramsey, environmental health experts of USAID, conclude that ‘the financing consortium could have required changes in the project's design but did not’, because the funders ‘were eager to participate in the project’ ” (Bosshard, 1999).

Lessons regarding financial institutions can be learned from the experience of the Manantali and Diama Dams:

- Development aid and construction is big business and during the politics of the Cold War, capitalism had only one moral value (and maybe still does), “the bottom line – profits”, as well as the next contract. The

philosophy of many firms was “give them as little as possible, just enough to meet their demands, thereby maximizing profits”.

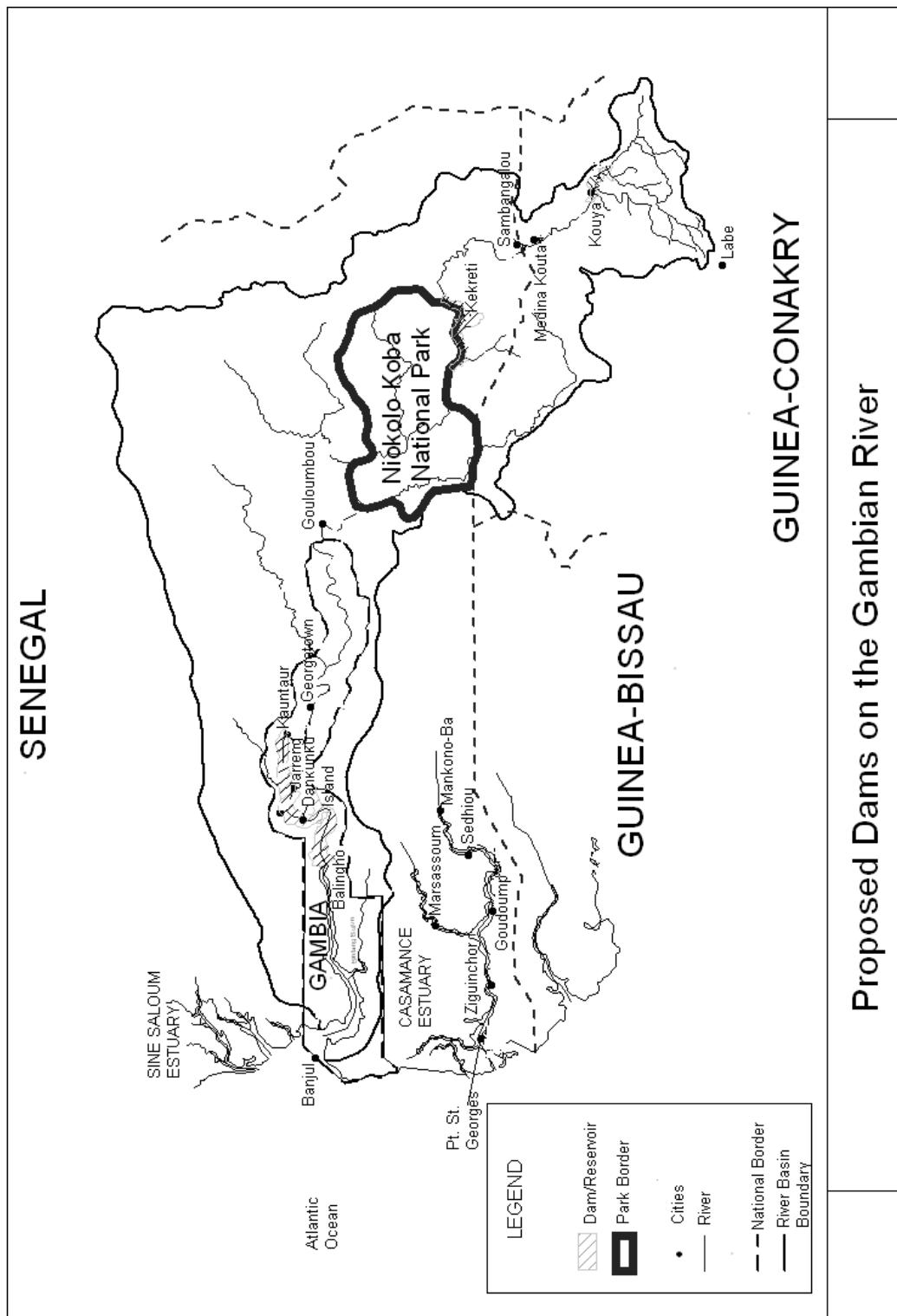
- Because development and construction takes place on foreign soils, the “Trojan horses” left behind, whether they work or not, are the problems of the host countries, especially the rural poor, but not of the foreign aid agencies, consultant or construction firms.
- In fact, profit can be made in studying the ecological and human tragedies post facto, and in trying to “do the impossible to fix Mother Nature after you have broken her” - with mitigative measures such as artificial floods, artificial estuaries, fish culture, etc., or relocating inundation victims, often to areas in which their lives are worse than before with poorer soils and living conditions.

The new Manantali hydropower project indicates that financial institutions, including the World Bank, have not yet internalized the negative lessons of past experiences.

One might ask, “What is worse, a plane crashing into the Twin Trade Towers of New York, killing about 3,000 people on 9/11/2001, or the lives of 500-800,000 people being destroyed as a net result of the Manantali/Diamma Dams, purely for profit motives”? Yet those responsible for this human and ecological tragedy and many more across the subcontinent have never been held accountable!

7.7.5 Politics of Proposed Dams on the Gambia River

Beginning in the early 1980s, the next river to be developed after the Senegal was the Gambia River Basin (GRB). German and English consulting firms located the Balingho anti-salinity barrage/bridge 128-134 km upstream from the river mouth and the Kekreti Dam about 790 km upstream from the mouth (Figure 7.3).



Source: Authors

Figure 7.3: Dams in the Gambia River Basin.

As on the Senegal River, American teams undertook the environmental assessment, only this time they did not try and justify the politically preferred alternative, possibly due to a large number of them originating from academic institutions (University of Michigan and Michigan State University) and thus refusing to be involved in the dirty politics of dam building. The well-known dam building company Harza¹²² had a minor role to play in this environmental assessment.

The principal author was hired on contract between 1982 and 1988 as the environmental advisor to the Gambia River Basin Development Organization/*Organisation pour la Mise en Valeur du Fleuve Gambie* (OMVG), the coordinating river basin planning body for the environmental study and development of the basin. He had a Senegalese counterpart, Idrissa Samba,¹²³ just retired from the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD). Member states included the Gambia, Senegal and Guinea-Conakry, with Guinea-Bissau eventually joining, mainly for political purposes, since none of its territory fell within the Gambia River Basin (GRB).

The Gambia River Basin is a semi-arid region of West Africa located between latitudes 11°.20' and 14°.45' and longitudes 11°.15' and 16°.30' West. The basin is limited by the Fouta Djallon Mountains in the south, the Senegal River Basin in the east, the Atlantic Ocean in the west and the arid Ferlo region of Senegal in the north. The basin covers 77,100 km², about 25% the size of the neighboring Senegal River Basin of 290,000 km². It lies in three different countries:

¹²² Harza Engineering Co., Milwaukee, Wisconsin, USA 53214, support@Harza.com, www.Harza.com. In 2000, Harza has merged with MWH (Montgomery Watson, Inc. of Broomfield, Colorado, webinfo@mwhglobal.com, www.mwhglobal.com

¹²³ Hajj Idrissa SAMBA, Environmentalist; African Development Bank/*Banque Africaine de Developpement* (ADB/BAD)/ONIN.0, Temporary Tunis Location ATR, BP 323-1002 Tunis, Belvedaire; Tunis Tel. +216-71102657; Fax: +216-71333680 Email: I.Samba@afdb.org or Idisamba@yahoo.com. Retired end of 2007.

- Guinea-Conakry: 15% of basin.
- Senegal: 71% of basin.
- The Gambia: 14% of basin.

The Gambia River extends a total of 1,180 km. Based on the hydrology of the basin, it is broken up into the:

- Estuarine Basin from the mouth in the Gambia to Gouloumbou, Senegal (Figure 7.3), the end of tidal influence, a stretch of 530 km in length covering 36,000 km². Within this basin is the Lower Freshwater River Zone from kilometer 250 upstream from the mouth at Kuntaur to Gouloumbou at km 530, the major zone of pumped irrigation potential.
- Continental Basin which is upstream from Gouloumbou, a stretch of 240 km long to the source a few kilometers from Labé in Guinea-Conakry at an altitude of 1,125 meters IGN (Institut Géographique National), covering 41,000 km².

The source of the Gambia River, the Fouta Djallon Mountains in Guinea-Conakry is often called the *Château d'Eau* or “West Africa’s water reservoir” since this is the primary source of water for major rivers such as the Gambia, Senegal and Niger (N’Diaye, 1987).

The major development objectives of the OMVG and its member states at the time of this analysis were (OMVG, 1985a *In: Samba & DeGeorges, 1987a*):

- Achieve self-sufficiency in food in the sub-region.
- Increase rural income and insure a more equitable distribution of income in the sub-region.
- Promote industrial development.

The role of planning was to take into account these development goals and eventually to provide decision-makers the prospects of achieving these goals within a reasonable time frame. It should allow the decision-maker to evaluate the trade-offs of achieving various development goals by different development scenarios and the “opportunity costs” of achieving development goals while protecting key natural resources, such as estuarine and floodplain fisheries and/or tidal/swamp culture, and still achieving goals of increased food production from irrigation. Originally, this was to be an EA of a two dam scenario, the Balingho Anti-Salinity Barrage and the Kekreti High Dam but because of concern over potential catastrophic environmental and social impacts, an EIS with multiple scenarios was undertaken. Development options included:

- 1) **Kekreti/Kouya/Balingho.** The high dams of Kekreti and Kouya, and the Balingho Anti-Salinity Barrage all on the main channel of the Gambia River with emphasis on irrigation.
- 2) **Politically preferred scenario: Kekreti High Dam/Balingho Anti-Salinity Barrage.** The scenario furthest along with regard to engineering feasibility studies, with emphasis on irrigation.
- 3) **Kekreti High Dam only** with irrigation in Senegal and the Gambia, and improved swamp rice culture in the Gambia.
- 4) **Kekreti High Dam only** with irrigation only in Senegal and improved swamp rice culture in the Gambia.
- 5) **The Sambangalou or Medina Kouta High Dams** on the main channel of the Gambia River with irrigation in Senegal and the Gambia along with improved swamp rice culture in the Gambia. The Sambangalou Dam face is in Senegal but the reservoir would continue into Guinea-Conakry. The Medina Kouta Dam face and reservoir would be entirely within Guinea-Conakry, but would not have as much power potential.

- 6) The High Dam of Kouya** in Guinea-Conakry on the Gambia River with irrigated agriculture in Guinea-Conakry, Senegal and the Gambia and improved swamp rice culture in the Gambia.
- 7) The High Dam of Kouya** with irrigation in Guinea-Conakry and Senegal and improved swamp rice culture only in the Gambia.
- 8) Non-structural – mini-barrages** mainly for small-scale irrigation.
- 9) No action**

The Balingho “bridge barrage”, conveniently located at the ferry crossing, would be dual purpose: control saline intrusion to allow upstream irrigation and provide rapid deployment of Senegalese military forces to put down if necessary and de-enclave the unruly Casamance, Senegal territory lying south of the Gambia. Its population, predominantly **Jola (Diola)**, continually push for secession (see Chapter 3, Section 3.1.4.1, Francophone colonial Africa). The problem is that the risks were very high in that the Balingho would have wiped out a major mangrove ecosystem and related fisheries and would have destroyed a minimum of 12,930 ha of tidal rice operated by about 43,000 women and an additional +40,000 ha of potential tidally irrigated rice in favor of pumped irrigated rice, which was not economically viable (see Sections 7.9.1.2, Gambia River and 7.9.7.2, Gambia River). There would have also been major health implications with an increase in water borne diseases.

A dam engineer, basing his decision on a base map and finding two promontories along which the dam face could be constructed, selected the dam site of the Kekreti. This just happened to be in a World Heritage Site, the Niokolo Koba National Park, and the construction of the dam was projected to have a major adverse impact on the movement of game. It was also along a major fault line. During the study, an earthquake centered a short distance north in the Fouta Djallon Mountains of Guinea-Conakry and measuring 6.3 on the Richter Scale

along this fault (Le Soleil, 1983 *In:* DeGeorges & Samba, 1987a), killed 200 and injured 300 people.

After spending approximately US\$ 16 million between 1983 and 1985 using multi-disciplinary teams of the University of Michigan/Michigan State and host country counterpart teams (Senegal, Guinea-Conakry, Guinea-Bissau and the Gambia), it was concluded that the best dam option would be a high dam in the Fouta Djallon Mountains (including the Sambangalou) to control river flow and saltwater intrusion, as well as provide hydropower. Analyses by both University of Michigan and the OMVG staff (Samba & DeGeorges, 1987a) indicated that any alternative with the Balingho would have grave consequences, both ecologically and socially. Mini-barrages for irrigation might also be useful. At the time, Senegal for security reasons did not want Guinea-Conakry controlling their water supply and rejected the idea of a high dam across their border.

One decision opted for during this study was that U.S. members be teamed up with counterparts from the host countries. This proposal was first resisted by USAID but then accepted at a meeting on the insistence by the then director of environment from the Gambia.¹²⁴ About 3-4 years later at an OMVG meeting of member states over the results of the Michigan Study, which put into question the economic and ecological viability of the Balingho Anti-Salinity Bridge Barrage, a Gambian technician¹²⁵ with the Department of Fisheries said, “I was in the field, helped work up the results in the laboratory and conducted the analysis. The results of the Michigan River Resources Team are as much mine as theirs, and I support their conclusions 100%”. The then high commissioner, Malick John, was shell shocked that one of his countrymen would make such a statement in front of politicians, putting his career on the line. This may have been one of the most

¹²⁴ Omar Fye, currently Senior Environmental Specialist, Africa Region, World Bank, Tanzania Resident Mission, Dar es Salaam, Tanzania, Tel: 255-22-211-4575, Cell: 255-744-440-412, Sfye@worldbank.org.

¹²⁵ Moussa Saidy Kahn, Department of Fisheries, The Gambia

rewarding moments in the principal author's period of stay with the OMVG – seeing how knowledge is power, and how giving “the little guy” information forces the often corrupt and self-serving politicians in line.

Of course, this did not stop USAID. The U.S. government (USAID) brought in a “Beltway Bandit”¹²⁶ from Washington, D.C. – RONCO Consulting Corporation, which was willing to say that the best and brightest from the USA and their counterparts were wrong and that international donors should return to the politically preferred alternative of the Balingho and Kekreti Dams. RONCO’s website¹²⁷, promotes the firm as a specialist in “humanitarian” mine clearance, security services, environmental remediation and post-conflict operations, providing “public and private sector clients with advisory, training, implementation, and management assistance”. RONCO’s current president, Stephen Edelmann managed the USAID/OMVG contract. In the book Mercenaries (O’Brien, 2000 *In:* Musah & Fayemi, 2000), RONCO is listed among Private Military Companies/Contractors (PMCs) and one of the first PMCs brought in by Rwanda after the genocide for demining expertise and technology, as well as limited training to Rwandan forces, providing similar expertise in Mozambique from 1996-1997. RONCO appears to have received its baptism serving as a “soldier of fortune” to the “highest bidder”, in the case of dams on the Gambia River to USAID/Senegal¹²⁸ who oversaw this project. Madsen (1999) gives further insight implying that RONCO served as a cover for direct U.S. invasion of both Rwanda and the DRC (see Chapter 13, Section 13.7.1.1, Legitimization of private military companies/contractors (PMCs) by western governments and international bodies).

¹²⁶ Alludes to the 495 beltway/road that circles the nation’s capital, allowing ease of access from Maryland and Virginia suburbs where the majority of government workers and their “private sector” contractors reside.

¹²⁷ RONCO Consulting Corporation, 2301 M Street, N.W., Suite 400, Washington, DC 20037, www.roncoconsulting.com/index.html

¹²⁸ Sarah Jane Littlefield - Director and Vito Stagliano

In the principal author's departing internal debriefing memorandum to USAID (DeGeorges, 1987a), it was stated that after RONCO had at first been requested to incorporate the principal author and his counterpart's report (Samba & DeGeorges, 1987a; 1987b), RONCO now appeared to be bypassing the institutionalization of the planning process to "hastily produce a 'Model Integrated Planning Document' (by RONCO) in which the OMVG had virtually no participation". Sensitive documents were being withheld from distribution, and it appeared that "attempts are being made by unscrupulous consultants to discredit the 16 million dollar University of Michigan study, where we sent over 'our best and brightest' to address a number of very complex and complicated issues". The memo went on to remind USAID that the need to analyze basin-wide alternatives

"as required by Federal law (National Environmental Policy Act – NEPA), by requirements in the project paper and amendment, and in his contract - has been eliminated. In its place basically a one scenario alternative, which is the politically preferred alternative of Kekreti/Balingho scenario was substituted, which all donors had refused to fund over the last 10 years. The situation was reminiscent of 1982 when the project was considered to be political, not technical in nature and advisors were forced to bias their analysis".

When the principal author first arrived in Senegal in 1982, suggesting that a no-action alternative projected along a 40 year planning horizon be compared against not only the politically preferred alternative but other dam options, he was reminded¹²⁹ that he was there to mitigate only the Balingho/Kekreti scenario – basically an EA, regardless of his concerns for the impacts of the Balingho barrage on a major mangrove ecosystem, associated fisheries and upstream tidally irrigated rice - or he would be removed from the project. It was not until the

¹²⁹ By USAID Project Manager, Louis Lucke

entire “University of Michigan” team refused to accept a one-scenario alternative because of the potential environmental and social consequences that USAID and the OMVG relented. The study eventually recommended against the Balingho Anti-Salinity Barrage due to the potential for adverse long-term impacts on both the natural and human-made environment that could not be mitigated. Eventually, the principal author was requested by the OMVG high commissioner¹³⁰ to change what he and others had written, namely that there was a strong risk of the Balingho wiping out a large portion of the mangroves and associated fisheries, to that there would be a minimal impact on these resources. The principal author refused as a technician explaining that this was his best professional judgment based on his life’s experiences and the findings by the University of Michigan Team. The principal author explained that the role of the high commissioner, who dealt at a political level, was to take this technical advice and work within the political realms of the member states but not to falsify data. The principal author was thanked. Eventually, the UNDP advisor¹³¹ to the OMVG was convinced to make the changes. With the help of USAID personal services contractor and acting project manager¹³², the UNDP advisor was eventually seconded to the Manantali Dam site on the Senegal River, addressing the inundation victim resettlement scheme where he would be less harmful, although, as is seen below, the resettlement scheme has been less than successful.

The above memo from the principal author to USAID (DeGeorges, 1987a) went on to stipulate to USAID that “the Michigan study and OMVG Working Document No. 20 (a classical environmental assessment using narrative matrices) (Samba & DeGeorges, 1987a; 1987b) must not be ignored. USAID must be willing to abide by Federal law and agency policy”.

¹³⁰ Malick John

¹³¹ French-Canadian Bob Demers.

¹³² David Hunsberger, who also did not support RONCO’s actions

It recommends that

USAID be accountable for and willing to, as are other branches of our government, enforce the laws of the land, in this case to the procedures which must be followed and parameters which must be addressed with regards to man and his natural resources in order to assure that development monies would have positive and beneficial effects on the very people whom we were trying to help. These laws included but were not limited to (DeGeorges, 1987a):¹³³

- **Foreign Assistance Act, Section 538b** concerning adequately addressing the environmental and social consequences of large dams in the tropics.
- **Foreign Assistance Act, Section 538g** requiring not only environmental evaluations, and recommendations for mitigation, but evaluations of alternatives.
- **Foreign Assistance Act, Section 538h** requiring the U.S. Secretary of Treasury to instruct U.S. executive directors of multilateral development banks to seek mitigation to adverse environmental impacts or adverse impacts (by dams) on indigenous people.
- **Foreign Assistance Act Section 117.63. Environmental and Natural Resources.**¹³⁴ If trends in degradation of natural resources in developing countries continues, they will severely undermine the best efforts to meet basic human needs, to achieve sustained economic growth and to prevent international tension and conflict...It is therefore in the economic and security interests of the United States to provide leadership both in thoroughly reassessing policies relating to natural resources and the environment, and in cooperating extensively with

¹³³ In the U.S. Foreign Assistance Act Of 1961 (PL 87-195) as amended in 2002 (USG, 2003), Section 538 (including 538 b, 538g, 538h) appear to have been removed jumping from Section 534 to Section 541.

¹³⁴ In the U.S. Foreign Assistance Act Of 1961 (PL 87-195) as amended in 2002 (USG, 2003), is Section 117 - Environment and Natural Resources.

developing countries in order to achieve environmentally sound development...President shall require all agencies and officials responsible for programs or projects under this chapter:

(A) To prepare and take fully into account an environmental impact statement for any program or project under this chapter significantly affecting the environment of the global common...

(B) To prepare and take fully into account an environmental assessment of any proposed program or project under this chapter significantly affecting the environment of any foreign country.'

- **Foreign Assistance Act, Section 118.64, Tropical Forests** assuring that development programs account for and look at alternatives to achieve sustainable use and account for impacts on biological diversity, denying assistance for any actions that may significantly degrade National parks or similar protected areas which contain tropical forests and deny assistance for construction of dams or other water control structures which flood relatively undegraded forest control lands.¹³⁵
- **Foreign Assistance Act, Section 119.66, Endangered Species.** Denies direct or indirect assistance for actions, which significantly degrade national parks or similar protected areas or introduce exotic plants or animals in such areas.¹³⁶

¹³⁵ In the U.S. Foreign Assistance Act Of 1961 (PL 87-195) as amended in 2002 (USG, 2003), is Section 118 - Tropical Forests.

¹³⁶ In the U.S. Foreign Assistance Act Of 1961 (PL 87-195) as amended in 2002 (USG, 2003), is Section 119 – Endangered Species.

- **Agency for International Development, 22CFR Part 216, Environmental Procedures.** This set of procedures is intended to implement the National Environmental Policy ACT (NEPA) of 1970 as amended as it affects the AID program. NEPA is a National law to which all branches of the government are bound and sets a set of guidelines for environmental review of all projects, stateside or overseas for which United States Government monies may be invested”.

This memo was ignored by USAID/Senegal decision-makers¹³⁷ who appeared to be the parties behind the reversal of ethical river basin planning efforts in the Gambia River Basin.

In an internal memo (DeGeorges, 1987c) to the USAID project manager¹³⁸, concern was raised that RONCO was analyzing complex 4-7 dam scenarios (e.g. Balingho/Kekreti/Kouya and Saltinho – giving a dam to the Gambia, one dam to Senegal, one to Guinea-Conakry and one to Guinea-Bissau) as opposed to “low end” single dam scenarios such as 1) Kouya with a bridge, 2) Medina Kouta with a bridge, 3) Sambangalou with a bridge and 4) Kekreti with a bridge. It was believed that insufficient data existed for the Saltinho Dam, which was in another river basin, Rio Corubal that drained into the new member state of Guinea-Bissau. It was recommended that now was not the time to throw this in, as it would mean omitting the environmental/socio-economic step in the planning process.

RONCO also claimed that costing of the upstream dams would not be possible and as a result, they would place an emphasis on calibrating an economical model for the Kekreti/Balingho scenario (politically preferred) as a demonstration

¹³⁷ USAID/Senegal Directress Sarah Jane Littlefield and her assistant Vito Stagliano

¹³⁸ David Hunsberger

model. The principal author was aware that Howard Humphreys¹³⁹, a British consulting firm, had cost estimates for Sambangalou. It was believed that the Polytechna Engineering¹⁴⁰ report (1981) also had cost estimates for the Medina Kouta and Kouya Dams. If not, an engineer using existing data could have produced preliminary cost estimates.

RONCO was also relying on older data from AHT¹⁴¹, Rhein Rhur¹⁴² and LRDC¹⁴³ consulting firm studies, which were biased towards irrigation agriculture as the solution to the Gambia River Basin's food needs. The RONCO team failed to contact the head¹⁴⁴ of USAID's GUARD project, who had been on the University of Michigan team, and served as acting chief of party helping to finish the study after the untimely death of the former chief of party¹⁴⁵. Dr. Gilbert played a critical role in putting together the Water Resource Management Report (University of Michigan, 1985a). In discussions with Dr. Gilbert by OMVG planning staff, (Samba, Dibba and DeGeorges), cost/benefits looked better for long-term improved swamp culture than irrigation. In addition, USAID's Mixed Farming Project was looking at improved rainfed agriculture (Gilbert, *pers. comm.*). RONCO's consultant, a Mr. Hesser said he would look into this. Michigan's final analysis concluded in favor of improved swamp culture over irrigation for many years to come (University of Michigan, 1985a).

By December 4, 1987, when the principal author was about to depart (most people with any knowledge of the truth were being scattered to the wind) for a

¹³⁹ Hill Park Court, Springfield Drive, Surrey Leatherhead, KT22 7NL

¹⁴⁰ Believed to be a Czechoslovakian consulting firm, no recent address found

¹⁴¹ Agrar-und Hydrotechnik GmbH, German Consulting Firm, AHT Group AG, Huyssenallee 66-68 Essen, Germany, info@aht-group.com, www.aht-group.com

¹⁴² Rhein-Rhur Ingenieur-Gesellschaft mbH (RRI), Burgwall 5, 44135 Dortmund, Germany
enviro@rri-do.de, merged in 2001 with Beller Consult GmbH engineering firm

¹⁴³ LRDC was a consulting firm that in 1984 produced a report form the OMVG entitled *Etude Agronomique liee au projet du pont-barrage a Balingho sur le Fleuve Gambie*

¹⁴⁴ Dr. Elon Gilbert

¹⁴⁵ Dr. Karl Lagler, the world famous Fishery Biologist from the University of Michigan

post as regional environmental advisor to USAID in the Caribbean, the RONCO chief of party sent a memo to the USAID/OMVG project manager¹⁴⁶ over his meeting with the OMVG high commissioner¹⁴⁷, stating that the high commissioner had pointed out that “the only remaining issue for OMVG was sequencing,” that is what would be the effects if either Balingho was built first or if Kekreti was built first. He said that the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) was going to fund a study on sequencing: which dam first? In other words, we were back to square one where the principal author had started in 1982 with a politically preferred alternative. After an expenditure of US\$ 16 million, teaming the best and brightest from West Africa with the best and brightest from America to determine that both ecologically, economically and sociologically the risks were too high to justify the construction of the politically preferred dams, they were going to do go ahead with the construction anyway at the expense of the rural poor, which this “development” program was to have helped.

David Hunsberger had contacts with Jacques Bugnicourt (passed away April 2002 in Paris) head of a local French run NGO, *ENDA Tier Monde*, who in turn was associated with the Natural Resources Defense Council (NRDC),¹⁴⁸ a legal environmental watchdog in Washington, D.C. The principal author and the USAID project manager¹⁴⁹ made a pact, regardless of the impact on their professional careers, to provide the NRDC with all technical documents in an attempt to prevent the funding of the politically preferred Kekreti/Balingho dam scenario and to require additional studies and planning to determine the location of a high dam in Guinea-Conakry, based on sound hydrological, economic, ecological and sociological comparisons. Provided with all the technical and

¹⁴⁶ David Hunsberger

¹⁴⁷ Malick John

¹⁴⁸ Glen Prickett then with NRDC, but in 2005 with Conservation International in Washington, D.C.

¹⁴⁹ David Hunsberger

political information, NRDC lawyers negotiated with USAID that any attempt to fund these dams without further study would result in a major lawsuit against the U.S. government. The principal author received one discrete call from the NRDC to the USAID/RDO/C office in Barbados where he was working, saying that he should not worry and that no dams would be built until more extensive studies were undertaken in the Gambia River Basin.

Thus, the attempts to destroy another river basin, creating social disruption, extinction or degradation of species and more food and economic dependency towards the West, were put to a halt. Was this the policy of the U.S. Government through USAID or was it the consequence of the bureaucratic structure within USAID, which promoted people for moving money as opposed to achieving real economic development? Certainly, at times, Robert Thomas Hennemeyer, the U.S. ambassador in the Gambia and the USAID directress in Senegal (OMVG Project run out of Senegal Office as opposed to USAID/The Gambia) were diabolically opposed as to where the OMVG should be going and who should be its high commissioner. The ambassador wanted the then high commissioner Malick John, removed on corruption charges, while Ms. Littlefield, the USAID directress, opposed this.¹⁵⁰

In 2005, after about 17 years, the appropriate choice in dams appears to be made.

“The Gambia River Basin Development Organisation (OMVG) is to implement new hydroelectric projects in Senegal and Guinea-Conakry to help to reduce local power shortages. A hydroelectric study for the benefit of OMVG is to be launched, with the aid of a US\$ 5.35 million grant from the Tunis-based African Development Fund (ADF). The 'Multinational Electric Power Grids' project aims to develop the region's largely unexploited energy potential, and leave it less dependent on petrol. Two large dams are planned: the

¹⁵⁰ David Hunsberger had proof of US\$ 15,000 in goods taken by the High Commissioner, small change in terms of foreign aid.

first located in Sambangalou, a village in southern Senegal at the river Gambia, the second at Kaléta, on the Konkouré river, central Guinea. The Sambangalou alone will have a capacity of 400 GWh. Along with the hydro plants, the project will feature a regional integration of power grids in the OMVG's four member countries, the "Gambia, Guinea-Conakry, Guinea-Bissau and Senegal" (International Water Power and Dam Construction, 2005).

It is likely that modeling of the Sambangalou on downstream hydrological and salinity regimes would be wise, as well as a closer look at the inundation zone. It is likely that a full blown environmental assessment should be undertaken for the Kaléta dam, if it has not already been undertaken. Funded by the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD), in 2003, the consortium of *Groupement Coyne et Bellier - Tecslt - Coba* (COTECO) confirmed the technical, economic and environmental feasibility. The report states that

"the environmental and socio-economic impacts of the Sambangalou hydropower project and possible mitigation measures...revealed that creating a 181 km² reservoir upstream of the River Gambia will reduce the water level downstream, and the resulting low flows will keep the saline wedge of the Gambian estuary some 100 km downstream of its usual mean location. It will thus make more than 7,000 ha of arable land (in the Gambia) free from salty water" (Gambia Daily News, 2005).

As is seen below, with appropriate flow regulation there were many more ha available for both improved swamp culture and irrigation (see Section 7.9.8.2, The Gambia River). Are we once again seeing agriculture and people sacrificed for revenue generating electricity that will likely provide little benefits to rural inhabitants who are not connected to the power grid?

7.7.6 Other River Basins

With regard to the Lake Chad Basin study, this was a classical “table top development study” funded by UNDP, a joint venture in 1980 between Dwars, Heederik en Verhey (DHV)¹⁵¹, a Dutch consulting firm, *Société Grenobloise d'Etudes et d'Applications Hydrauliques* (SOGREAH)¹⁵², a French consulting firm, and Gannett Fleming Corddry & Carpenter (GFCC), an American consulting firm for whom the principal author worked. Two members of the team made a trip to the Lake Chad Basin and collected reports. The principal author, as a team member responsible for assessing impacts on fisheries who had never visited the basin, spent two days in Paris meeting with French fishery biologists to obtain their ideas, concerns and recommendations. The entire team then met for about five days in Chamrousse, a French ski resort, and planned development activities for the basin. Some of the consequences are seen below.

Additionally, case studies are brought in which are taken from the literature concerning ecological and sociological impacts from dams on rivers in Sub-Saharan Africa. Some are discussed in greater detail than others. Impacts associated with dams in the Zambezi River Basin are highlighted in some detail.

7.8 ENVIRONMENTAL COSTS OF DAMS AND RELATED DEVELOPMENT IN AFRICA

7.8.1 Dam Impacts on Floodplains

As is seen below, the major adverse downstream impact from dams on African river system is the modification of flood regimes to the detriment of the ecology,

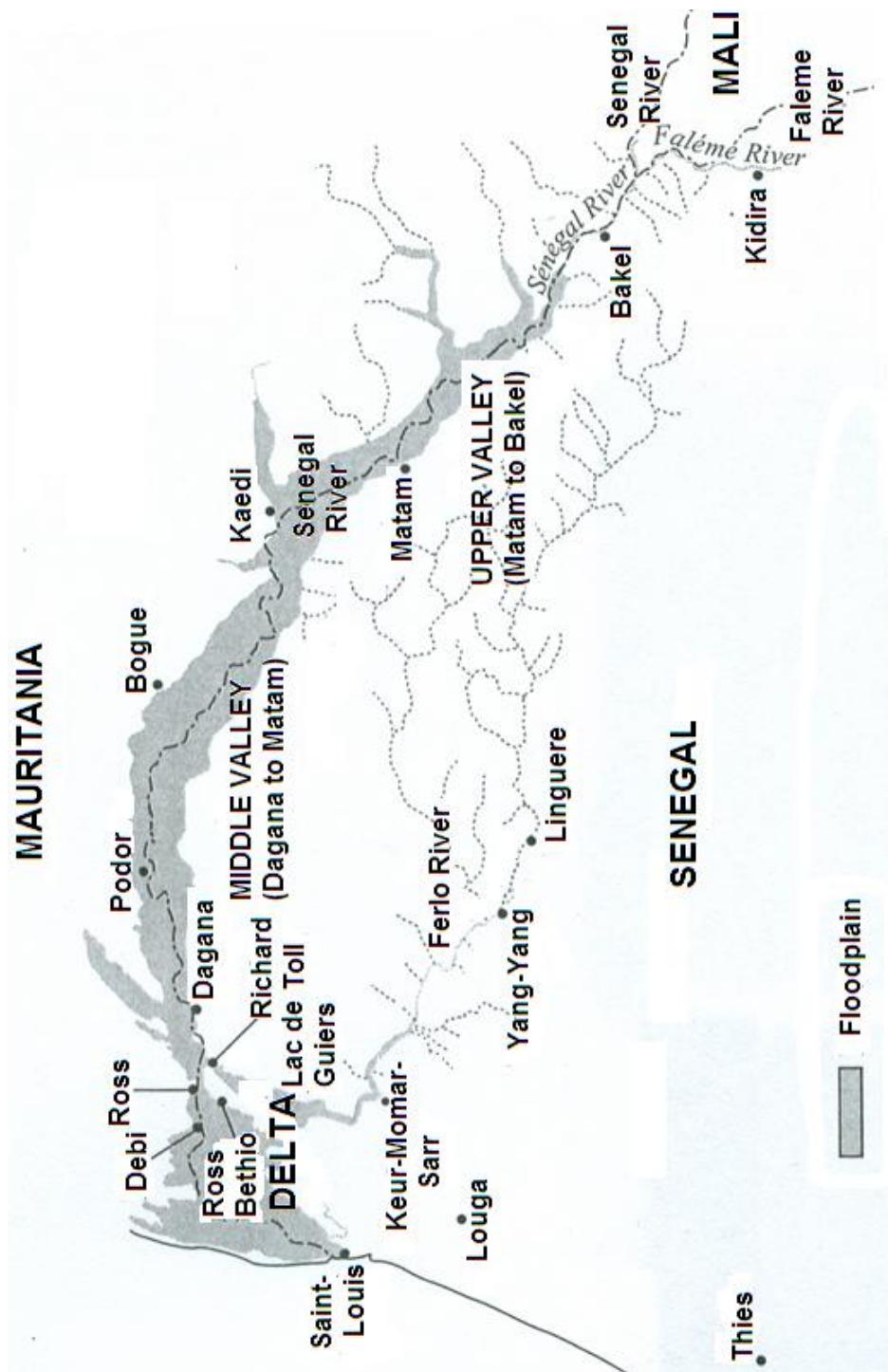
¹⁵¹ DHV Group, Laan 1914 no. 35, P.O. Box 219, 3800 AE Amersfoort, The Netherlands, 31-33-468-3700, info@dhv.nl

¹⁵² Sogreah International, 6 Rue de Lorraine, 38130 Echirolles, BP 172, 38042 Grenoble Cedex 9, France, sogreah@sogreah.fr, Tel: 04-76-33-40-00, FAX: 04-76-33-42-96

traditional production systems and ultimately humans and their survival. African floodplains, especially in the low rainfall Sahelian and Sudano-Sahelian zones, are among the most productive and diverse ecosystems on the continent, often an artery of life in an otherwise low production environment. They serve as spawning and nursery grounds for fish, provide critical waterbird habitat, are used for recession agriculture after the flood passes and are critical dry season grazing grounds for both livestock and wildlife. The loss of these floodplain systems from “development” has been devastating to communities all over Sub-Saharan Africa. These descriptions provide quantitative estimates on floodplain losses from dam construction.

7.8.1.1 Senegal River

For centuries, the annual floods of the Senegal River have been the lifeblood of flood recession agriculture, fishing, and cattle grazing for hundreds of thousands of people (Figure 7.4). The rainy season in the upper watershed traditionally occurred between June and October and resulted in downstream flooding between July and November (Gould, 1981). The floods provided nutrients to the floodplain and coastal fisheries and recharged the aquifers on which villagers depended for their domestic water supplies. Retreating floodwaters enriched the soil by depositing nutrient-rich silt on the land, providing both agricultural land and pasture.



Source: Boone (2003) with permission, Cambridge University Press.

Figure 7.4: Senegal River floodplain

Flooding occurred along a 600 km (360 mi) stretch of the river just below Bakel, with floodplains being as wide as 20 km (12 mi) in the Middle Valley, from Dagana to Matam (Boone, 2003). FAO (1997) estimates that prior to the construction of the dams “the floodplain of the Senegal stretched up to 30 km in width, and ran 600 km downstream of Bakel. It covered about 1 million ha and supported farmers, pastoralists and fishing communities. Up to half a million people depended on the flood-related cropping in the ‘waalo’ (and ‘falo’) land of the floodplain” (see Chapter 2, Figure 2.2: Cross-Section of Middle Valley, Senegal River showing makeup of *leydi* territorial units).

With the Manantali Dam in place, it was estimated that flooding would be reduced from 459,000-549,000 ha during an average flood in 1980 (pre-dam) to 190,000 ha by 2028 under full development of irrigation, hydropower, navigation, etc. (GFCC, 1980b; 1980d). An artificial flood was planned for 15 years to assure inundation of 100,000 ha of flood recession land, after which it would be stopped as irrigation took over (GFCC, 1980b). According to Koopman (2004), in one area artificial floods were so weak that flood recession agriculture was only possible in two of the last 15 years. As will be seen below, current artificial flooding allows an average of about 50,000 ha available for recession agriculture in the Senegal River Basin.

7.8.1.2 Gambia River floodplains

Where floodplains tended to dominate in the Senegal River Basin’s aquatic and terrestrial production, the extensive mangrove systems dominate aquatic production in the Gambia River Basin (GRB). There were 158,000 ha of floodplain; 109,000 ha of floodplain in the Gambia and 49,000 ha in Senegal; it is unclear what percentage was true floodplain versus rainfed swamp (DeGeorges, 1987d). The FAO (1985 *In:* Harding & DeGeorges, 1987) estimated 10,000 ha of river fed floodplain on the Gambia River. To date, no dams have been built.

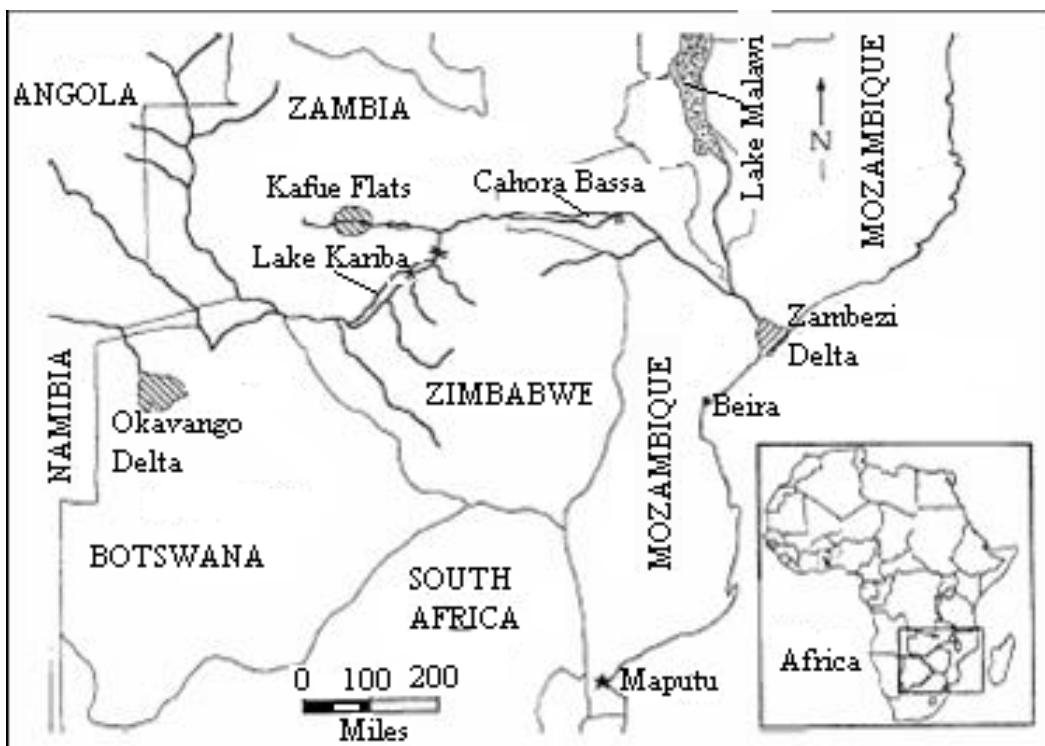
7.8.1.3 Impacts of Cahora Bassa on downstream flooding, Zambezi Delta, Mozambique

Operational since 1974, “the negative social effects of Cahora Bassa were linked to its hydrological and ecological impacts” (Isaacman & Sneddon, 2000) (Figure 7.5).

“The Zambezi basin below Cahora Bassa covers an area of approximately 340,000 km² from the upper Rift Valley highlands to the Zambezi Delta. The Lower Zambezi is a complex physical system with four river-floodplain zones comprising narrow gorges, mobile sand-braided reaches, anabranching reaches, and coastal distributaries.

Discharges below the gorge since construction of Cahora Bassa Dam are nearly constant throughout the year. The magnitude of monthly flows is sharply reduced during the entire flooding season, including a 64% reduction in the mean monthly flow during February-April and 45% reduction in January and May. Average monthly flows in November have nearly quadrupled, from 542 m³/s to 1,958 m³/s.

Flood peaks during the mid-1990s, when turbines were not operating, were derived from local runoff in the Lower Zambezi as Cahora Bassa released a constant discharge of about 1,700 m³/s. Flood peaks in the Delta below Cahora Bassa dam reached only 3.6 m in 1993. Overall, the average duration of flooding has decreased sharply” (Beifuss & dos Santos, 2001).



Source: Davies, Beilfuss & Thoms (2000) with permission, E.Schweizerbart'sche Verlagsbuchhandlung.

Figure 7.5: Zambezi River Basin

7.8.1.4 Kafue floodplains, Zambia

Under natural conditions, the annual variation in the area of inundation on the Kafue Flats was from a minimum of about 300 km² to in excess of 5000 km², varying with rainfall from year to year. The vegetation of the flats was zoned according to the flood regime and the soil as woodland savannah (predominantly acacia), termitaria grasslands, permanent swamps (reeds and papyrus) and floodplain grasses/sedges. About 700,000 people live on or in the vicinity of the Kafue Flats (DFID, 2002).

Constructed in the 1970s, when full, the Kafue Gorge Reservoir inundates the eastern half of the Kafue Flats permanently, covering 600-1600 km² (60,000 to 160,000 ha) of former seasonally inundated floodplain such that the downstream

half of the Kafue Flats is now considered part of the Kafue Gorge Reservoir (Figure 7.5). When full, the Kafue Gorge Reservoir inundates the eastern half of the Kafue Flats up to Lochinvar National Park (Kamwenesche, Beilfuss, & Simukonda, 2002). In order to keep up with power demand, the Itezhitezhi Dam was constructed at the western side of the Kafue Flats, eradicating the seasonal floods over the remaining part of the floodplain. The Itezhitezhi Dam releases water to the Kafue Gorge Dam during dry periods. The construction of the Itezhitezhi Dam commenced in 1973 and began impounding water in December 1976 (WWF/Netherlands, 2002). The Itezhitezhi Dam assures an adequate year-round flow of 120 m³/sec to the Kafue Gorge Dam turbines to produce 450 MW of electricity (DFID, 2002).

The construction and operation of the dams has had a major impact on flooding. Releases from Itezhi-tezhi have meant almost no change in the maximum area flooded each year. While maximum areas inundated remain about the same, the duration of flooding has been diminished since the Itezhitezhi Dam was built (DFID, 2000). While the temporal pattern of the natural flow regime is maintained, on average, wet season flows to the flats are reduced and dry season flows are enhanced, which along with the Kafue Gorge Dam results in the annual minimum flooded area increasing from about 300 km² to about 1500 km², a 20% loss in the original flood recession area (Acreman, Farquharson, McCartney, Sullivan, Campbell, Hodgson Morton, Smith, Birley, Knott, Lazenby, Wingfield & Barbier, 2000; DFID, 2002). Due to increased dry season flows, permanent lagoons have formed where ephemeral aquatic habitats existed before and “in part because of the inundation and backwater effects caused by the Kafue Gorge dam” (DFID, 2002). “At the downstream end of the Flats, the minimum water-level has been raised by about 3 m and the difference between maximum and minimum levels is now 1.2 m where under natural conditions it was in excess of 4 m. This has affected both the ecology and livelihoods of people utilizing the natural

resources of the Flats" (Acreman, *et al.*, 2000). "In broad terms the western half of the Flats is drier (i.e. frequency and duration of flooding is considerably reduced), whilst the eastern half of the Flats is wetter (i.e. frequency and duration of flooding has increased) than they were prior to dam construction" (DFID, 2002).

The greater dry season inundation is because of elevated water levels at the downstream end of the flats from backwater effects caused by water storage behind the Kafue Gorge Dam. Natural dry season recession could be simulated if the Kafue Gorge Reservoir was drawn down further earlier in the dry season (Acreman, *et al.*, 2000).

"Zambia Electricity Supply Corporation (ZESCO) is obliged to maintain a specified minimum flow ($40 \text{ m}^3/\text{s}$) in the river between Itezhitezhi and Kafue Gorge, to preserve the ecological habitat and to service other water users. Water is abstracted for a variety of purposes, including municipal supplies and irrigation – primarily sugar cane growers (the largest being the Zambia Sugar Company (ZSC) and winter wheat producers" (DFID, 2002).

This amounts to 15% of the live storage. In order to replicate the natural flooding regime, a daily minimum flow of $300 \text{ m}^3/\text{sec}$ is released over a four-week period each year. This is slightly less than the natural mean annual runoff of the whole catchment of about $350 \text{ m}^3/\text{sec}$ (DFID, 2002).

The local attitude toward floodplain resources (particularly wildlife and fisheries) is one of resignation, the resources belonging to outsiders (Kamwenesche, *et al.*, 2002). Up to 250,000 cattle graze the flats during the dry season along with some recession agriculture. The two national parks of Lochinvar and Blue Lagoon, along with the Nakambala Sugar Estate have blocked traditional cattle routes to water and grazing (DFID, 2002). Fishermen are predominantly immigrants and

safari or urban hunters do most of the hunting. The inhabitants have not been integrated into the management of these resources nor do they benefit from their exploitation (Kamwenesche, *et al.*, 2002). DFID (2002) distinguishes between locals fishing the flats and outsiders fishing the Itezhitezhi Reservoir. In addition, neither piped water nor electricity has benefited local inhabitants. Typical of dam development, 70-90% of the people still rely on firewood for energy and boreholes, wells and streams for water. This “open access” mentality is believed to be the net result of local communities losing control over management of natural resources in favor of centralized controls, which ultimately do not work very well in Africa.

7.8.1.5 Waza Logone floodplain, Cameroon

In the extreme Northern Province of Cameroon, just upstream from Waza National Park and its floodplains, the Maga Dam was constructed in 1979 on the Logone River, creating a 400 km² reservoir for the purpose of the *Secteur Expérimental de Modernisation de Riziculture de Yagoua* (SEMRY) rice irrigation scheme. In addition, on the left bank a 100 km long containment bank was constructed. Prior to the SEMRY scheme and Maga Dam, the value of the 3,382 km² Waza Logone Floodplain was estimated to be (Table 7.1):

Table 7.1: Economic benefits from annual flooding of the Waza-Logone floodplain

ECONOMIC SECTOR	TOTAL VALUE (Euros/US\$)	VALUE/UNIT AREA (Euros/km ² US\$/ km ²)
Pasture Benefits	6,075,100/7,168,618	1,800/2,124
Fisheries Benefits	3,425,600/4,042,208	1,005/1,186
Agricultural Benefits	705,900/832,962	215/254
Grass Benefits (Thatch, Baskets)	779,000/919,220	230/271
Surface Water	21,400/25,252	15/18
Supply Benefits		
NET BENEFITS	11,007,000/12,988,260	3,265/3,853

Source: Extracted from Loth (2004) with permission, IUCN.

The net result of these actions was estimated to be a reduction in flooding along the left bank of 964 km² (96,400 ha) for an average flood, an equivalent of about 30% in reduction of the normal area flooded of from about 3,382-3,571 km²/year to between 2,418-2,500 km²/year (Loth, 2004). The Waza-Logone Floodplain makes up a portion of the Logone Floodplain known as *Le Grand Yaéres* that floods an area of 6,000 km² on the Cameroonian side of the river or 11,000 km² (Loth, 2004), flooding both Cameroon and Chad (de Iongh, *pers. comm.*¹⁵³; Paul Loth, 2005/8/11). This caused severe social upheaval over an 800,000 ha (8,000 km²) area (Loth, 2004) when considering the loss of flooding in both Cameroon and Chad (de Iongh, *pers. comm.*; Loth, 2005/8/11).

Additionally, the SEMRY and other irrigation schemes in the Chari-Logone River Basins have had major regional impacts. Until the early 1970s, Lake Chad was the sixth largest lake in the world (Loth, 2004), averaging less than 7 m deep at 250 m above sea level (Chandler, 2001). The Chari-Logone River system to the south that drains the runoff from the Mandara Mountains of the Adamoua (Adamawa) Plateau in Cameroon accounts for 95% of the flow into Lake Chad. Today this river system accounts for 50% of the decline in water entering Lake Chad because of withdrawal for irrigation (Loth, 2004). The drainage basin of Lake Chad covers 2,500,000 km² over seven countries (Lycklama à Nijeholt, de Bie & Geerling, 2001). Geologically, Lake Chad was originally an ancient sea stretching as far as the Nile Basin, covering some 300,000 km², before practically drying up in the 18th and 19th centuries and partially regenerating in the 20th century (Agence France-Presse, 1999). At its peak in the 1960s, Lake Chad was about 23,000 km² (Benech, 1975), others say up to 26,000 km², the second largest wetland in Africa (USGS, 2004). During the drought of the early 1970s, the lake

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split into distinctly separate northern and southern basins. At the time when the two basins were totaled, the lake was about 13,000 km² (Benech, 1975).

By 2002, Lake Chad had been reduced to about 5% of what it had been (Loth, 2004; NASA, 2001) or somewhere between 1,150 to 1,300 km² compared to the 1960s. USGS (2004) estimates that it was reduced to 10% (2,600 km²) of what it had been in the 1960s (26,000 km²) (Figure 7.6). Lycklama à Nijeholt, *et al.* (2001) estimate that the surface area of Lake Chad had been reduced from 25,000 km² in 1960 to 2,500 km² by 2001. The northern part of the lake has basically disappeared. Chandler (2001), places the fluctuation in Lake Chad's surface area at between 25,900 km² in 1963 to 1,350 km², a 20 fold decrease in surface area, while Bomford (2006) places the current size as 1,295 km². According to the U.S. Geological Survey's website (USGS, 2004)

"changes include more enhanced exposure of dune features, increased wetland vegetation in the water (red), decreased wetland vegetation on the outside edges, decreased water surface (blue), and an increase in irrigation activities along the Chari River to the southeast. The decreased peripheral vegetation may suggest that these areas that can be classified as wetland are getting smaller as desertification takes place".

Loth (2004) and Coe and Foley (2001 *In:* NASA, 2001) state that: 1) climatic changes (e.g., lower rainfall, increasing temperatures and thus evaporation) and 2) the widespread use of water by humans (e.g., irrigation) are the main causes for this regional phenomenon. Coe and Foley (2001 *In:* NASA 2001) and Chandler (2001) calculate that a 30% decrease took place in the lake between 1966 and 1975. Irrigation only accounted for 5% of that decrease, with drier conditions accounting for the remainder. They noticed that irrigation demands increased four-fold between 1983 and 1994, accounting for 50% of the additional decrease in the size of the lake as noted by Loth (2004).

7.8.2 Dam Impacts on Groundwater

Without careful planning, modification of the flood regime can result in decreased infiltration inflow of surface to ground water and, as one approaches river deltas, exasperate saltwater intrusion into the groundwaters, which may be important for both irrigated agriculture and potable waters.

7.8.2.1 Senegal River

In the Senegal River, it was projected that irrigation in perimeters placed in the delta, where groundwater is saline and close to the surface, could result in soil salinization due to the rising of salt to the surface from the groundwater as a result of capillary forces. The mitigative action for this problem is to place irrigated perimeters away from areas with saline water tables close to the surface and/or to install expensive artificial drainage (GFCC, 1979).

7.8.2.2 Gambia River

Where planned, groundwater in the Gambia was good to excellent for irrigation and no significant impact was projected for this resource (Table 7.2).

**Table 7.2: Groundwater quality data for irrigation potential,
Gambia River Basin**

AQUIFER	IRRIGATION POTENTIAL
Continental Terminal, Lower River	Excellent To Good
Oligo-Miocene/Eocene, Lower River	Excellent To Good
Maestrichen, Lower River	Excellent To Good
Continental Terminal, Mid-Section/Upper River	Excellent to Good
Oligo-Miocene/Eocene, Mid-Section/Upper River	Inadequate data
Maestrichen, Mid-Section/Upper River Headwaters	Inadequate data
	Inadequate data

Source: DeGeorges (1987c)

7.8.3 Dam Impacts on Surface Water Quality

7.8.3.1 Senegal River

In the Senegal River, overall changes in water quality due to proposed development were considered light to moderate. The most significant change projected was from the Diama Dam preventing salinity intrusion during the dry season to areas upstream of the dam. This change significantly altered water chemistry and aquatic communities in the portion of the river between the Diama Dam and Doué *Marigot*, where water will now remain fresh year-round (GFCC, 1979).

The Manantali Reservoir in Mali was predicted to behave like a monomictic lake, experiencing an annual thermocline (temperature change greater than 1 °C/m of depth) and an “overturn” of water once a year during the winter months (December-January) as the warmer surface waters decrease in temperature and thermocline breaks down. Especially in initial years, oxygen depletion and build up of toxic hydrogen sulfide were predicted in the bottom waters (hypolimnion) from anaerobic respiration. Discharges below the Manantali Dam of hypolimnial waters could result in fish kills from hydrogen sulfide up to 7 km downstream of the dam. Increases in aquatic plants or algal biomass could occur even further downstream from elevated nutrients levels (GFCC, 1979).

7.8.3.2 The Gambia

The freshwater reservoir, which would be created by the Balingho Barrage, would extend upstream to Kauntaur. Tidal action would be eliminated upstream of the barrage. The reservoir was predicted to suffer from salinization, acidification and

low oxygen levels, taking years to develop a stable aquatic food chain and a viable fishery. The high dams in the headwaters of the Gambia River would experience some of the same phenomena as described for the Manantali Dam on the Senegal River, both rivers having their origins in the Fouta Djallon Mountains of Guinea-Conakry.

7.8.4 Invasive Plants behind Dam Reservoirs

Once reservoirs are created in the tropics, they are targets for many invasive species, especially floating aquatic plants, which can impact navigation and result in tremendous losses of water from evapotranspiration, blanketing areas acting as “cloud cover” so that phytoplankton cannot photosynthesize. This results in fish kills, as oxygen is used up because respiration exceeds net primary production. Blankets of floating aquatic plants also provide habitat for disease vectors such as those that carry malaria and schistosomiasis. These are common problems all over Africa in both natural bodies and human-made lakes.

7.8.4.1 Senegal River

Salvinia spp., *Typha spp.*, *Pistia spp.* have all been problems (GFCC, 1980g). Biocontrol and water management helped control *Pistia spp.* Water hyacinth (*Eichhornia crassipes*), the world’s worst waterweed, is being sold as an ornamental at plant nurseries in the cities of Saint Louis and Dakar. If water hyacinth plants were somehow transferred to the river upstream of the Diama Dam, which is only 27 km upstream of Saint Louis, a new ecological disaster would emerge (Kloff, 2002). Fishing in the Diama Reservoir is seriously hampered by the dense stands of *Typha spp.* and by the floating invasives *Pistia stratiotes* and (since 1999) *Salvinia molesta* that are blocking the channels (Hamerlynck, Duvail, & Old Baba, 2000). In addition, the 16,000 ha Djoudj

National Bird Sanctuary and Diawling National Park across the river in Mauritania have both been threatened by invasive plants as noted above. Biological control using a weevil *Cyrtobagus (Cyrtobagous) salviniae* is helping to control *Salvinia molesta*. *Salvinia* “forms a substrate for other invasive weeds, exhausts the river’s oxygen and increases the habitat for disease-bearing snails and mosquitoes” (UNEP-WCMC, 2002).

7.8.4.2 Gambia River

A “red flag” was raised as a word of precaution. The plans of putting dams on the Gambia River were predicted to be in jeopardy due to the introduction of water hyacinth, *Eichhornia crassipes*, into the Gambia. This ornamental salt tolerant plant was originally restricted to freshwater garden and hotel ponds in the Banjul area, but began to slowly work its way upriver. With the creation of freshwater reservoirs, the ideal habitat for this plant, concern was raised for its proliferation. An example was given of Louisiana, USA, in which ten plants proliferated 655,360 new plants in one eight month growing season. In the Gambia and Senegal, the growing season would be year-round. Invasion by water hyacinth could (Samba & DeGeorges, 1987a):

- 1) Result in tremendous losses of water destined for other priorities through evapotranspiration.
- 2) Result in habitat for snail and mosquito disease vectors.
- 3) Increase the rate of sedimentation into reservoirs.
- 4) Cause navigational hazards.
- 5) Result in the loss of fish sets if wind blown mats move over a net, preventing access in a timely manner by fishermen and resulting in the catch rotting in the nets.

Since 1982, the OMVG Environmental Advisors had recommended a concerted effort to remove this nuisance from the Gambia River Basin (GRB) before it became well established. At the time of this assessment in 1987, no action had yet been taken.

7.8.5 Impoundment Fisheries from Dams

Impoundments can create rich fisheries, but often at the expense of richer fisheries in the downstream floodplains and estuaries.

An empirical relationship between total dissolved solids (TDS) and/or conductivity exists as an indirect way of measuring nutrient abundance linked to average depth. This relationship was first developed by Ryder (1965) and Ryder, Kerr, Loftus and Regier (1974) using total dissolved solids as a means of estimating potential annual fish yields in kg/ha. Henderson and Welcomme (1974) used more readily available conductivity data linked to average depth. The two parameters are interrelated $TDS\text{ (mg/l)}/0.65 \approx \text{Conductivity in umohos/cm}$. The higher the conductivity or TDS, the higher the nutrients and thus potential for primary and then secondary production. Average depth is an indirect way of measuring the productive littoral zone: the shallower the lake the more productive it is.

7.8.5.1 Senegal River

For the Manantali Reservoir on the Bafing River of the Senegal River Basin, the annual yield/catch of fish using the morpho-edaphic index (MEI)¹⁵⁴ graph from

¹⁵⁴ Morpho-Edaphic Index relates Surface Area, Volume and average depth as indicative of the abundance of the shallow littoral zone and thus age of lake (e.g. young/oligotrophic and old/eutrophic) as well as indirectly habitat and productivity, along with conductivity or total dissolved solids as an indication of nutrient abundance and potential primary productivity to support fish populations.

Henderson, Ryder and Kudhongania, (1973 *In:* GFCC, 1980a) was predicted to be between 65-86 kg/ha/year of fish. Using more recent morpho-edaphic indices formulas from Henderson and Welcomme (1974) and Schlesinger and Regier (1982), estimates would range from 13-21 kg/ha/year. Fish catches in the Manantali Reservoir cannot be considered a compensation for the losses in the Senegal River Valley. It is believed that a change in species composition occurred in the Diama Reservoir, with the elimination of estuarine migratory species and an increase of the more sedentary, opportunistic species (Clariidae [Clariidae], Cichlidae). However, surveys have not been undertaken and/or no data have been made available from surveys carried out by Senegal (Hamerlynck, *et al.*, 2000). Since the Manantali Reservoir surface area would vary between 477 and 275 km² depending on operational level (GFCC, 1980b), maximum fish yields would likely vary between a low of 358 metric tons/year to a high of 4,102 tons/year, depending on average operational level and ultimately the long-term productivity of the reservoir. This demonstrates the weaknesses of estimating change in nature and ultimately the importance of establishing long-term monitoring programs in collaboration with local resource users, in this case fishermen, to assure that the offtake is sustainable.

7.8.5.2 Gambia River

If a more “up-to-date” empirical formula is used, the following projections might be obtained for the proposed dams (Table 7.3).

These projections lie between the Samba and DeGeorges (1987a; 1987b) estimation for Kekreti of 550 metric tons/year (16 kg/ha/year), employing 500-1,500 full/part time fishermen, and the University of Michigan (1985a) study projections for Kekreti (64/kg/ha/yr), the Kouya Reservoir (26 kg/ha/year) and the Balingho (88 kg/ha/year). For planning purposes, these estimates are adequate.

Once a dam is constructed, as projected for the Manantali on the Senegal River, there would be an initial jump in fish production and annual yield/catch in the first 5-10 years, as organic matter and nutrients of terrestrial origin become available to the aquatic food chain. This would then drop and level off and would require a monitoring program to track this phenomenon.

Table 7.3: Projected fish yields (Kg/Ha/Yr) from proposed reservoirs on the Gambia River

Reservoir	Surface Area (m ²) 10 ⁶	Volume (m ³) 10 ⁶	Average Depth (m)	Conductivity (umhos/cm)	TDS (mg/l)	MEI (TDS)/Depth	Yield Metric Tons & kg/ha/yr
Balingho	716	1,400	1.96	60	39	19.9	5,069/70.8
Kekreti	338	3,500	10.4	55	36	3.5	1,470/43.5
Sambangalou	420	15,000	35.7	55	36	1.44	664/15.8
Kouya	101	4,270	42	55	36	1.44	160/15.8
Medina Kouta	210 ⁶	5,000	23.8	55	36	1.5	720/34.3

- 1) Average Depth = Reservoir Volume/Surface Area. b) Volume. c) Conductivity extracted from University Of Michigan (1985b) Water Quality Data. umhos/cm = usiemens/cm d) Total Dissolved Solids (TDS) = Conductivity (0.65 conversion factor), e) MEI = (TDS in mg/l)/Mean Depth (m). f) Assume Average Annual Air Temperature is 25 °C g) Metric Tons/yr = Yield (kg/ha/year) x (Surface Area 10⁶ m² x ha/10⁴ m²) x (tons/1000 kg), h) all average depths over 25 m calculate as 25m since greater depths fish production insignificant.
- 2) Using Schlesinger and Regier (1982) if >25 m average depth: \log_{10} Maximum Sustained Yield (MSY) in kg/ha/yr = 0.044 (Temperature °C) + 0.482 \log_{10} (MEI₂₅) + 0.021 & if <25 m average depth \log_{10} MSY = 0.050 (Temperature °C) + 0.280 \log_{10} (MEI) + 0.236
- 3) Prepared by principal author

Most importantly, as in the Senegal River, though there are projected increases in fish production within the impoundments, they would in no way replace the loss of the estuarine/marine fish complex projected to be lost.

7.8.5.3 Kariba Dam, Zimbabwe, Zambezi River

In Lake Kariba, excluding introduced species, more species could be found after than before impoundment in the same stretch of river. Thirty-one species were recorded in the middle Zambezi before the Kariba Dam was built. Forty species were recorded after impoundment (WCD, 1999). Marshall (1984 *In: Kapetsky & Petr, 1984*) found 40 species in the reservoir compared to 28 before. Jackson and Marmulla (2000) argue that pre-impoundment surveys showed that there was a limited variety, some 14 species of fish in the river, while today in the lake that number has risen to 47 species.

Lake Kariba is considered an oligotrophic system with low fish production potential (low nutrients, deep, shallow littoral area) (Marshall, 1984 *In: Kapetsky & Petr, 1984*; Jackson & Marmulla, 2000). Applying the Morpho-edaphic Index (MEI), it has the lowest potential yield of any of the large African reservoirs (Table 7.4).

Table 7.4: Projected fish yields from key reservoirs using the Morpho-edaphic Index (MEI)

LAKE	MEI	YIELD (kg/ha/yr)
Volta, Ghana	6.1	32.77
Nasser-Nubia, Egypt/Sudan	9.2	40.4
Kainji, Nigeria	6.6	34.6
Kariba, Zimbabwe	2.8	23.2

Formula: $Y = 14.3136 (\text{MEI}^{0.4581})$, where MEI = umhos/cm (conductivity)/Mean Depth, where Mean Depth = Volume/Surface Area, Y = Yield in kg/ha/yr

Note formula from Henderson and Welcomme (1974): $14.3136 (\text{MEI}^{0.4681})$ (Typo: 0.4581 in Kapetsky & Petr, 1984)

Source: Marshall (1982 *In: Marshall, 1984 In: Kapetsky & Petr, 1984*) with permission, UN & FAO.

The Kariba Reservoir, “extending 280 km from Devils Gorge to Kariba Gorge and 30 km at its widest point, is the third largest in Africa and inundates 5,250 km² of the Gwembe Valley floor” (Beilfuss & dos Santos, 2001). Using the MEI derived yield of 23.2 kg/ha/year and surface area, one would predict a potential annual fish catch of 12,180 metric tons, nearly one half of actual fish yields as indicated below. The low potential for fish yields is due to low primary production limited by phosphorus and nitrogen deposited upstream on the Barotse Floodplain in Zambia. Smaller inflowing rivers are richer in nutrients but contribute only 14% of the lake’s water. Nutrient losses in the outflow may be higher than imports (Kapetsky & Petr, 1984).

Marshall (1984 *In:* Kapetsky & Petr, 1984) estimates an inshore fishery of 2,000 tons/year, assuming 30% of the lake was fishable, and 8,000+ tons/year for the kapenta – not having Zambian statistics. According to Kureya (1998), “The fishery for kapenta of Kariba currently lands about 21,000 tons a year compared with an estimated potential of some 30,000 tons. The pelagic stocks are now exploited at close to their maximum”.

Most fish production is in shallow littoral areas. Within the inshore areas, crocodiles consume the equivalent of 10% of the catch. Catch composition is shifting toward benthic fishes, especially catfishes (e.g., *Synodontis zambezensis*). In 1989, there were nearly 2,000 artisanal fishers in Zimbabwe and nearly 1,000 in Zambia on the reservoir. Most fishers (91%) in Zimbabwe were full time and fished with 2-3 gillnets. The fishery was plagued by high catch spoilage and low productivity (Jackson & Marmulla, 2000).

In those areas where the Ba-Tonga were able to settle on the new reservoir shoreline, a huge area of mopani woodland, up to 4-10 km wide and extending 4-10 km into the lake (shallow water areas of 2-5 m deep), was cleared prior to the

lake filling. These clearings were separated by approximately 2.59 km (1-mile) wide strips of land where the trees remained and were used for a time for fish as breeding areas and breakwaters until the trees rotted and fell down. These areas, prepared by the then Rhodesian government for gillnetting by the Ba-Tonga fishermen and for deeper water commercial fishing, resulted in a thriving Ba-Tonga fishing industry (Thomson, *pers. comm.*). Kapetsky and Petr (1984) estimate that 954 km² ($\approx 18\%$) of the lake floor down to 20 meters deep was cleared. “Fish mongers”, as they were called by the Ba-Tonga, came from Bulawayo to trade for dried, smoked and salted fish, resulting in the development of a major fishing industry in the Binga District. Likewise, the commercial fishing company of Irvin & Johnson sub-contracted to the Ba-Tonga fishermen, collecting fresh fish with freezer boats. Since 1965 and continuing into the present, hundreds of tons of fish have been removed yearly by the Ba-Tonga in the Binga District (Thomson, *pers comm.*). Jackson and Marmulla (2000) argue that fishing camps for local residents have been established on the south shore, as at Sampakaruma. The poor physical and social conditions there over the years suggest that there is little sense of ownership of the site. It remains a mini-version, but more self-managed, of the migrant labor system, since most Ba-Tonga were settled inland. Colson (1971 *In:* Kapetsky & Petr, 1984) argues that the Ba-Tonga were not primarily fishermen and that a variety of sociological reasons inhibited them. Enthusiasm, which existed early on in the initial years with a jump in fisheries production, declined as the ecology of the lake settled down and fish yields stabilized at a lower level.

The introduction of exotic species such as kapenta (*Limnothrissa miodon*) from Lake Tanganyika into the Kariba Reservoir and eventually through the Kariba turbines into the Cahora Bassa Reservoir, both on the Zambezi River of Southern Africa, appeared to be positive, taking up the void in a biological niche, an open lake phytoplankton feeder, resulting from the damming of this river (see Chapter

4, Section 4.1, INTRODUCTION). This has resulted in the development of major fisheries and a major protein source for the poor of Southern Africa. Tigerfish (*Hydrocynus vittatus*) now live in the open water where they live on the kapenta. *Tilapia macrochir* have also been introduced and have become a major fishery resource (Marshall, 1984 *In: Kapetsky & Petr, 1984; Thomson, pers. comm.*).

To fish kapenta requires a special rig (Figure 7.7), shore facilities and the means to market. In Zimbabwe, the industry from the start has been dominated by commercial (white) operations, some offshoots of the largest fishing companies in Southern Africa.

In the mid-1980s, donors supported an indigenous cooperatively owned and managed rig on the Zimbabwe side as a means to enable resettled people to gain access to the industry. A permit was obtained from the authorities and there was some assistance given by a large company. In Zambia, an NGO, Harvest Help, opened up ownership of rigs to locals, expecting one rig to be attached to each multi-purpose cooperative. That venture has failed. The rigs are now leased to a large commercial operator out of Siavonga (WCD, 1999).

There was talk in 2003 of the unregulated artisanal fishing with gill nets having significantly reduced the Tigerfish and *Tilapia* populations as a sport fishery. This is confirmed by WCD (1999) stating that fisheries management on Lake Kariba had taken a turn for the worse over the last 5-8 years, as there was minimal management control. Recent sharp declines in Kapenta catches raise serious issues of management (WCD, 1999). This can only have worsened with the destabilization of Zimbabwe beginning in 2000 and continuing through 2008.

7.8.5.4 Cahora Bassa Reservoir, Mozambique

Fishermen were forced to change from riverine and floodplain harvesting techniques to deepwater lake fishing techniques. *Barilius zambezensis* and small *Barbus* species, which are characteristic of fast-flowing rivers, disappeared from Cahora Bassa following impoundment (WCD, 1999). Many riverine species likely disappeared, but there was a substantial increase in the harvest of kapenta and Tigerfish from the new reservoir.

Bernacsek and Lopez (1984 *In:* Kapetsky & Petr, 1984) estimate an annual sustainable yield of 6,700 tons of table fish (mainly *Hydrocynus sp.*, *Distichodus sp.* and *Labeo sp.*) and 8,000 tons of kapenta from the Cahora Bassa Reservoir. Kureya (1998) “estimated than no more than 5,000 tons of fish are currently taken throughout the country (Mozambique). Potential catches of 20,000 to 25,000 tons from Lake Niassa (Lake Malawi) and 15,000 tons for Cahora Bassa have been estimated”.

During the last decade, South African and Zimbabwean commercial fishermen using large boats and nets (Figure 7.7) depleted much of the kapenta population. These commercial fishermen have also undercut the effectiveness of local fisherman with canoes, many of whom rely on the catch to supplement household diets and income. Many peasants indicated that they had abandoned fishing altogether (Beifuss, Chilundo, Issacmen & Mulwafu, 2002). In recent times, it appears that the Mozambican government has begun a program to monitor the offtake of kapenta. The Mozambican government now has a statistician working with the kapenta fishermen to monitor their catches so as to assure sustainable management of this important resource. In addition, a major difference between the Kariba and Cahora Bassa kapenta fisheries is that most trees were removed within the Kariba inundation zone, while in the Cahora Bassa inundation zone the

trees were left standing. While fishing can take place virtually anywhere in the Kariba, the large areas of underwater forests in Cahora Bassa act as a safe haven for the kapenta from both the fishermen and the predatory Tigerfish, making it much more difficult to over-fish this fishery as compared to that in the Kariba (Hougaard, *pers. comm.*).

During the principal author's August 2003 visit to see students on the Cahora Bassa Safaris crocodile farm, local kapenta fishermen and the croc farm manager (Hougaard, Tarr & Caiwood, *pers. comm.*) explained that with the end of the civil war many people are moving onto the reservoir and are fishing with gill nets as a main occupation. The kapenta fishermen are all sport fishermen and are concerned that within five years, if the current uncontrolled pressure continues, the *Tilapia* and Tigerfish populations will be over-fished, ruining an excellent sport fishery, as well as a way for local people to feed themselves and earn a livelihood. Jasper Thornycroft (*pers. comm.*) claims that over-fishing of sport fish is already happening in Lake Kariba. The Zimbabwe Conservation Task Force is also concerned that fish are netted in the rivers flowing out of the Kariba Basin (restricted breeding areas) into the reservoir and that Zimbabwe is facing the total decimation of the Tigerfish population in Kariba (African Conservation Foundation, 2003). What currently exists is an "Open Access Resource" that needs to be turned into a "Common Property Resource".

The kapenta fishermen want to divide the reservoir into management units controlled by various fishing communities, setting aside nursery areas (e.g., tributaries into reservoir up which Tigerfish spawn, shallows where *Tilapia* spp. spawn), controlling access as a means of controlling fishing pressure, monitoring catch per unit of effort, mesh size versus fish size (try to find mesh size that leaves young fish uncaught), etc.

Shawn Caiwood (*pers. comm.*) believes that a human-fish-crocodile-human cycle is being set up in which people are over-fishing, resulting in less food for the crocodiles. This is causing an increased number of crocodile attacks on people. Shawn Caiwood explained that since the beginning of 2003, over a six-month period, 38 people had been killed by crocodiles, 15 within the previous two weeks (by mid-August). He explained that the government gave Piet Hougaard of Moçambique Safaris a contract to shoot 500 adult crocodiles, which the crocodile farm managed to stop since they were concerned about the potential for illegal exports and thus how the Convention on International Trade in Endangered Species (CITES) might react, with potential adverse impacts on their export business. Mozambique currently allows export (CITES quota) of 60 wild crocodile skins/year of which Tete Province has 20 CITES tags. Ironically, CITES requires that the crocodile farm release back into the wild 5% of the crocodile hatchlings at the age of one and one and a half years. The government does not agree with this but it assures the fulfillment of CITES requirements for farm raised crocodiles necessary to maintain a CITES quota that permits the international export of hides.

7.8.5.5 Volta River, Akosombo Dam/Volta Reservoir, Ghana

At the end of the 1960s, when the reservoir was first filled, annual fish yields were around 60,000 tons, in some years generating more income than sales of electricity (McCully, 2001).

In 1979, 20,000 fishermen on the lake caught over 40,000 tons of fish (McCully, 2001). The catch was projected to stabilize at around this annual yield/catch (Kapetsky & Petr, 1984). If one uses the estimated annual yield/catch of 32.77 kg/ha/year based on MEI from Table 7.4 and an average surface area of 8,500 km² (McCully, 2001), a yield of 27,855 metric tons/year of fish would be estimated. Although out of the same report as Table 7.4, but in a chapter by a

different author and somewhat contradictory, Vanderpuye (1984 *In: Kapetsky & Petr, 1984*) using MEI estimated a yield of 12 kg/ha/year versus an actual yield of 42.5-47.6 kg/ha/year from 1970 to 1976.

The MEI (Morpho-edaphic Index) of potential fish yield underestimates the potential since “essential nutrients” released by the breakdown and mineralization of the organic load are immediately picked up by algae and *Ceratophyllum* sp. (a submerged aquatic plant) from high water temperatures, resulting in quick turnover and high net productivity. Thus, TDS/conductivity provides an inaccurate status of the Volta Lake’s potential fish yield (Vanderpuye 1984 *In: Kapetsky & Petr, 1984*).

Little is known of the pre-impoundment fisheries, though early on in the reservoir’s life, catches were dominated by *Alestes nurse*, *A. dentex/baremose* and *Hydrocynus spp.* Experimental fishing between 1969 and 1973 indicated that Clupeidae (*Pellonula afzeliusi* and *Cynothrissa mento*) and Schilbeidae (*Eutropius niloticus* and *Schilbe mystus*) accounted for 57% of the catch by weight. Eight species/families made up 90% of the catch by weight: *Alestes baremose/dentex*, *A. macrolepidotus*, *Labeo* sp., *Lates* sp., *Chrysichthys* spp. and *Alestes nurse/leuciscus*.

The 80,000 displaced farmers gained little from this fishery. Formerly migrant fishermen who have become permanent settlers on the reservoir shore undertook almost all fishing (McCully, 2001).

7.8.5.6 Kainji Dam, Nigeria

Finished in 1968, the 1,300 km² reservoir/hydroelectric dam, located on the mainstream of the Niger 1,200 km from the river mouth, had a dramatic impact on fisheries both up and downstream (Läe, Williams, Malam, Morand & Mikolasek,

2003). After impoundment, there was a reduction in species diversity from 160 species to approximately 97 fish species in the inundation zone (Läe, *et al.*, 2003). The reservoir area was predicted to sustain annual fish yields of 10,000 tons. In 1970, two years after flooding, the reservoir experienced an initial burst of 28,600 tons (McCully, 2001), but by the mid-1970s had stabilized to around 4,500 – 6,000 tons/year (Kapetsky & Petr, 1984; McCully, 2001). This annual fish catch is only slightly higher than that taken from the stretch of river prior to being inundated by the dam (McCully, 2001).

7.8.5.7 Lake Nasser, Aswan High Dam, Egypt

Although the dam face of Lake Nasser (Aswan High Dam or Sadd el-Ali) is in Egypt, 150 km of its 500 km length lie in the Sudan and it is fed by nine Sub-Saharan countries that form its watershed: Burundi, the DRC, Egypt, Kenya, Rwanda, Sudan, Ethiopia (Eritrea), Tanzania and Uganda. The Aswan High Dam provides a classical case study not only on its socio-economic and ecological impacts, but also on the geo-politics of water and dams (see Chapter 13, Section 13.11.1, Nile Basin Water Conflicts). Reservoir fisheries yielded US\$ 7.2 million/year in the mid-1980s, with 95% of the yield being *Tilapia galilaea* and *T. nilotica*. It was believed that the 1977 landings of 22,500 tons/year were near the maximum potential of the reservoir and that anything above this resulted from increased fishing pressure into younger age-class fish (Abdel-Latif, 1984 *In:* Kapetsky & Petr, 1984).

7.8.6 Dam Impacts from Flow Regulation on Freshwater Floodplain Fisheries

“Everybody knows that there is no more fish in the river...Everybody knows that the river is ruined”. - Golmy Adama Diarra, a local Senegalese farmer in the Senegal River Valley, referring to the effects of the Manantali Dam (Probe International Website, 2004).

The fish species living in the main rivers of the Sahel have a life cycle that is adapted to the characteristic seasonal flooding, migrating onto the floodplain to spawn, and returning to the river bed with the new generation at the water's retreat. Terrestrial cattle droppings, decaying agricultural debris and grasses are recycled through the aquatic food chain, making a major contribution to fisheries production (Welcomme, 1975; WCD, 2000). The construction of dams in upstream areas and the management of the hydrological regime has in general been extremely destructive to these fisheries.

7.8.6.1 Impacts on floodplain fishery, Senegal River

During the wet season, from August through December, the Middle Valley exhibits characteristics of a freshwater fishery, relying on inundation of the floodplains to replenish the fish stock by providing habitat for breeding and a nursery for various species. During the dry season, the river waters gradually subside, forcing the fish populations to leave the floodplain and concentrate in the main channel. All freshwater fishes caught are consumed, including zero-age class fish (under one year of age). The more important families of freshwater fish consumed include Osteoglossidae, Mormyridae, Characidae, Citharinidae, Claridae (Clariidae), Schilbeidae, Bagridae, Mochocidae, Cichlidae and Centropomidae (GFCC, 1980a). GFCC (1980b) projects changes in fish yields from proposed development as follows based on estimates of traditionally flooded the annual yield/catch averaging 60 kg/ha flooded per year (GFCC, 1980b) (Table 7.5):

Table 7.5: Annual fish harvests in the Senegal River Basin before and projected harvests after various levels of proposed development, assuming annual average flood

Year	Metric Tons Fresh Fish/Year							
	Lac de Guiers	Lac R'Kiz	Aftout – es-Sahel	Diamal Dam	Senegal River Estuary	Manantali Reservoir	Flood plain	Total
1978 (a)	2,250	-----	5	7,500	4,000	-----	33,000	46,755
1986 (b)	2,750	1,200	5,000	4,500	----- (c)	4,000	31,800	45,250
1987 (d)	2,750	1,200	5,000	4,500	Same -	3,000	20,400	37,850
2002 (e)	2,750	1,200	5,000	4,500	Same	3,000	19,200	35,650
2003 (f)	2,750	1,200	5,000	4,500	Same	3,000	13,800	30,250
2028 (g)	2,750	1,200	5,000	4,500	Same	3,000	11,400	27,850

- a. Present Conditions, Floodplain of 549,000 ha
- b. Diamal Dam completed, estuary fishery is lost; increase in harvests occurs due to recharge of natural impoundments (Lac R'Kiz and Aftout-es-Sahel), some floodplain lost to agricultural development
- c. Estuarine Fishery as it presently exists is destroyed. 1987-2028, the same.
- d. Manantali complete. Significant loss of floodplain fishery due to decrease in magnitude and duration of natural flooding, and continued agricultural development; some flooding maintained artificially to assure recession agriculture. In the Manantali Reservoir, an initial flush of nutrients results in peak fish production followed by a drop and then stabilization of fish production as primary productivity levels off, typical of impoundment fisheries. Total area flooded \approx 340,000 ha.
- e. Same as in 1987 with continual loss of floodplain due to agricultural development. Total area flooded \approx 320,000 ha.
- f. Discontinuing artificial flooding results in significant loss of floodplain. Total area flooded \approx 230,000 ha.
- g. Same as 2003, with continued loss of floodplain area due to agricultural development and water used for hydropower and navigation, amounting to 190,000 ha total in floodplains.

Source: Extracted from GFCC (1980b), USAID public domain & principal author responsible in preparing table for GFCC

Both estuarine and floodplain fisheries have been significantly reduced. Only 16,000 ha of the artificial estuary have been put under management (Kloff, 2000; Hamerlynck, Duvail & Old Baba, 2001), compared to a planned 10,000-35,000 ha artificial estuary (DeGeorges, 1984), whereas to fully inundate the Aftout-es-Sahel would require the inundation of up to 100,000 ha (DeGeorges, 1984; Hamerlynck, Duvail & Old Baba, 2001). No reference can be found to artificially flooding *Lac R'Kiz*, so it is assumed that this has not happened. Invasion by

aquatic plants seems to be affecting fish yields on *Lac de Guiers* and the Diamma Reservoir.

Fish production in the river and estuary has dropped by 90% (GEF, 2002). This implies that estuarine yields of fish after the dams would have dropped to about 1,150 tons/year¹⁵⁵ and freshwater floodplain fishery yields would be down to 3,300 tons/year¹⁵⁶. GFCC (1980b) estimates that the estuarine area produced 11,400 tons of fish/year before the dams (Diamma and Estuary in 1978). Prior to the Manantali, an estimated 33,000 metric tons/year was harvested from the freshwater floodplain (GFCC, 1980b). Jackson and Marmulla (2000) and WCD (2000) estimate that 11,250 tons of fish per year from the Senegal River floodplain system were lost following dam construction (Jackson & Marmulla, 2000; WCD, 2000), resulting in a net yield of 21,750 tons/year. GFCC (1980b) estimates a loss of 12,600 metric tons/year from the floodplain once the Manantali was in place; resulting in a net yield of 20,400 tons/year. The net result is fishery yields without significant floods and estuarine management appears to have resulted in much lower yields than projected. Thus, if one tries to reconstruct an estimate of fish yields today one would get (Table 7.6):

¹⁵⁵ This would be a 90% reduction in the pre-dam estuary, which would include the 7,500 metric tons from the “Diamma Dam” area that was part of the estuary plus the 4,000 metric tons shown as the Senegal River Estuary, which is the portion of the estuary below the Diamma Dam face.

¹⁵⁶ This would be a 90 % reduction of the pre-dam floodplain catch of 33,000 tons/year. If the average flood, the case in 2007 was 50,000 ha/year at 60 kg/ha/yr, this would be a fairly accurate estimate of annual yields.

Table 7.6: Projected fish harvests based on review of literature after construction of the Manantali and Diamma Dams, Senegal River

Year	Metric Tons Fresh Fish/Year							
	Lac de Guiers	Lac R' Kiz	Aftout-es-Sahel	Diamma Dam	Senegal River Estuary	Manantali Reservoir	Flood plain	Total
Today	2,250 ---	---	2,286	4,500	1,150	3,000	3,300-21,750	16,486-34,936

Note: It was predicted that 5,000 tons of fish would be caught in the Aftout-es-Sahel after inundating 35,000 ha, but only 16,000 ha were inundated, meaning a yield of 2,286 tons.

Source: Principal author

Given that artificial flooding has been minimal, averaging 82,600 ha/year for only 7-8 weeks, one would tend to lean to the low side estimate (see Section 7.10.7.1, Senegal River). In 1980, 10,000 full-time and 10,000 part time fishermen were employed along the Senegal River and would have been adversely impacted by these changes (GFCC 1980b; 1980d). While prior to dam completion there would have been a net surplus of fish within the Senegal River Basin in 1980, GFCC (1980b; 1980d) estimated with human population growth and the projected adverse impacts on the riverine/estuarine fisheries from dams that by 2000 out of a demand for 110,930 metric tons and based upon a predicted harvest of 35,650 metric tons, a deficit of -75,280 metric tons. By 2028, there would be a demand for 240,120 metric tons/year and based upon a predicted harvest of 27,850 metric tons, a deficit of -212,270 metric tons/year. These deficits could only be made up by trucking in marine fish, through improved storage and preservation techniques (estimated for African inland fisheries that 50-70% of the catch lost between harvesting and marketing from bacterial degradation and infestation by insect eggs and larvae), and to a lesser degree fish culture (GFCC, 1980b; 1980d).

In 1992, a rural peasant farmers' association issued a manifesto, which asked the administrative authorities, in cooperation with the farmers, to regulate the artificial flood in such a way as to favor flood-recession farming and the reproduction of "river fish". They also asked that a land and development policy be evolved that would give priority, first to the present and future needs of river inhabitants, then to the present and future needs of the inhabitants of the rest of Senegal and which would take into account all possibilities for developing the land, not just irrigation. They received no reply (Adams, 2000b).

7.8.6.2 Impacts on floodplain fishery, Gambia River

The University of Michigan study estimates that there are 109,940 ha of wetlands in the Gambia and 49,500 ha of wetlands in Senegal, some of which may be rainfed and cutoff from flooding by the river. Though important, compared to the previously presented history of the Senegal River, the relative area flooded is very small.

About 30 species of fish have been identified, whose life cycle and thus production are tied to the freshwater floodplains. This helps explain why yields from freshwater fisheries in the Gambian and Senegalese portions of the Gambia River Basin in recent years have decreased as rainfall and corresponding flooding have decreased (Dorr, Schneeberger, Tin & Flath, 1985 *In: DeGeorges, 1987d*). This same phenomenon has been observed in the more extensive floodplain fisheries of the Senegal River Basin.

Jackson and Marmulla (2000) estimate that floodplains can provide an annual yield/catch of 200 – 2,000 kg/ha/yr. The GFCC (1980a) study used 60 kg/ha/year annual yield/catch for the Senegal River Floodplain fish projections. If the FAO (1985 *In: Harding & DeGeorges, 1987*) estimate of 10,000 ha of river fed

floodplain is accurate, a potential annual yield/catch of 600 metric tons from the Gambia River Floodplain is obtained by using the estimated yield for floodplains fish of 60 kg/ha/year from the Senegal River. This equates closely with the actual 637.2 metric tons/year of floodplain-tied fish from 1982/83 catch records (DeGeorges, 1987d). However, local fishermen at the time felt that fish yields were down due to the drought and decreased flooding. Much of this fishery would likely be degraded as flood regulation and conversion of land to pumped irrigation reduces habitat for floodplain dependent species. Only a long-term monitoring program would allow a more precise estimate of the annual yield/catch per ha from these freshwater floodplains and what might be lost if these floodplains were taken out of production from decreased flooding and/or conversion to irrigated perimeters for rice production.

7.8.6.3 Impacts on Zambezi Delta floodplain fishery

Traditionally, in the Zambezi Delta, fish were the most important source of protein for the local population, especially during times of food shortages. Seasonal fishing camps were established on the Zambezi Floodplains between the main Zambezi Channel and Mungari River Distributary. The annual months of low flows enabled a high catch of fish per-unit-effort because fishers were able to wade into the river using simple gill nets and baskets (Beilfuss, *et al.*, 2002). A total floodplain harvest of about 10,000 tons/year was estimated under historical flooding conditions (Beilfuss & dos Santos, 2001). Downstream of the Cahora Bassa Dam in the Lower Zambezi Valley, 83 species of fish are known to have occurred, many more than between Kariba and upstream of the Cahora Bassa Dam face before impoundment. Downstream of the Cahora Bassa Dam, most of the species are still found today but the size and quantity of fish have dramatically decreased and several species have disappeared – especially in the Zambezi Delta region (Beilfuss, *et al.*, 2002). Much of this has to do with the loss of the

floodplains from flow regulation for hydroelectricity (Beilfuss, *et al.*, 2002) by the Kariba, Cahora Bassa and Kafue Dams. The rapid rise and fall of the Zambezi River, caused by the operation of the Cahora Bassa Dam, is also blamed (for lower fish catches). Gill nets cannot be used under these circumstances. After the extensive delta flooding of 2001, fishing camps were re-established on the floodplains for the first time since the 1978 flood and fish harvests were the highest (in total catch and biomass) since Cahora Bassa was constructed (Beilfuss, *et al.*, 2002). The contribution to the loss of delta floodplains and thus fish production from the Kariba Dam versus the Cahora Bassa and Kafue Dams must still be determined.

7.8.6.4 Kafue Flats, Zambia

The modified flood regime is believed to have impacted fish productivity. Fisheries production has also been impacted by irrigated sugar cane farming on the southeastern side of the Kafue Flats: Zambia Sugar Company (ZSC) with over 10,000 ha and Ceres Farm with around 5,000 ha. These farms irrigate with water from the Kafue River and sugar-cane processing effluents rich in nutrients (WWF/Netherlands, 2002) and biological oxygen demand (BOD–oxygen consuming organic matter) are discharged back into the river. The nutrient rich effluents contribute to aquatic plant growth such as water hyacinth, “Kafue weed” (*Eichhornia crassipes*), that affects navigation of dugout canoes. Water hyacinth can cover an area of surface water as a mat, preventing phytoplankton from photosynthesizing and thus providing the life giving oxygen for fish and other aquatic life. Excessive hyacinth growth has suffocated fish in the river, thereby affecting the fishing (WWF/Netherlands, 2002). Likewise, the oxygen consuming organics in the effluent discharge can result in similar impacts.

According to DFID (2002), the average annual yield/catch between 1966 and 1977 prior to construction of the Itezhitezhi Dam was 7,820 tons and between 1978 and 2000 after construction was 6,719 tons. However, the latter period contains the extremely dry years in the early 1990s when lower catches might be expected. A student-t test showed no significant difference between pre- and post-dam catches. Likewise, Acreman *et al.* (2000) agree that the dry years had an impact on fisheries, but more importantly believe that the changed flood regime resulted in changes in fish species, decreased the catch per-unit-effort, and resulted in the number of fishermen declining from 2,634 in 1977 to 1,157 in 1985.

The fish ban during the fish-breeding season is not well enforced (Kamwenesche, *et al.*, 2002).

7.8.6.5 Waza Logone Floodplain, Cameroon

Excellent overviews of the Lake Chad Basin fisheries and the ties between fish production, annual yield/catch and floodplain inundation can be found in Durand (1977) and Blache, Milton and Stauch (1962). Iltis (1975) discusses the Yaéres Floodplains and associated species, while Benech (1975) describes the impacts of the 1972/73 drought on fish production in the Lake Chad Basin.

The Waza Logone Floodplain, making up a portion of the Yaéres,¹⁵⁷ supports a large fishery, both in its main river channels and permanent lakes and in flood-fed and seasonal creeks, ponds, depressions and other wetlands. The Waza-Logone

¹⁵⁷ “The floodplains are referred to as the Yaéres. It depends probably on the context. The Waza Logone floodplain mostly refers only to that part of the Yaéres that is located East of the Waza Park down to the Maga dam” (Loth, 2004/8/16). In Figure 7.9 7.8 the Yaéres looks to be most of the floodplain on the west bank of the Logone River.

portion of the floodplain covers from 2,418-3,382 km² (Loth, 2004). Traditionally, the Kotoko ethnic group controlled fishing, but in the last decade of the 20th century, the Musgum, who arrived in the 19th century, challenged the supremacy of the Kotoko over-fishing rights. This resulted in conflicts and an eventual agreement by the Kotoko over exclusive fishing rights (Loth, 2004). It appears that some of the traditional controls over managing the fishery resources, as described in Chapter 2, have been modified, many being lost. Fishing grounds became opened to everyone as “Open Access Resources” (Loth, 2004). The major period of spawning on the Yaéres Floodplains is from August to September (Iltis, 1975).

As water begins to spread onto the floodplain in July, catfish (*Clarias spp.*) are speared and clubbed in the shallows as they leave the river and pools of the dry season. The *grand pêche* begins at the height of the flood in September/October and lasts until January/February. By September, as the flood peaks, fishing camps are set up on the floodplain and fishermen employ traps to catch fish, primarily *Clarias spp.*, *Petrocephalus bovei*, *Brycinus nurse*, *Oreochromis niloticus* (*Tilapia nilotica*) and *Synodontis nigrita* that spawn in the *marigots* (distributaries off main river channel), moving onto the floodplains to grow and returning to the river with the recession of the floods. As the floodwaters recede, migrant fishermen move in to fish the *marigots* (distributaries off main channel onto floodplain) as fish return to the main channels. Fishermen leave the floodplain for a short time to fish the main channel of the river for the sardine *Alestes spp.* (*Salanga*), the last to arrive on the floodplain and the first to leave, returning to the main channel of the Logone River as the flood recedes, normally beginning in November. They then return to the floodplains to catch fish trapped in depressions left by the receding floods. Artificial fishing canals/trenches dug during the dry season join depressions to the river, acting as *marigots*. In January and February, fishermen use gill nets in the artificial hand-dug trenches and place

nets across the entrance of the canals as they enter the river chiefly for *Clarias spp.* (54%), *Oreochromis niloticus* (32%), *Hemichromis fasciatus* (3.7%), *Synodontis spp.* (3.6%) and *Ctenopoma petherici* (2%). From February until the flood returns in July, subsistence fishing or *petit pêche* is undertaken with set nets, cast nets and hooks in natural and artificial depressions. These hand-dug trenches often interfere with and are a major source of conflict with immigrating pastoralists and their cattle herds (Loth, 2004). Fishing is practiced year-round in the main river channel with gill nets, long lines, cast nets, seines and weirs (Iltis, 1975). Typical of African floodplain ecosystems, annual yield/catch of fish is estimated at between 40 and 60 kg/year of floodplain on the Logone Floodplain (Loth, 2004).

Fish yields prior to this development scheme were estimated to range between 12,000 and 15,000 metric tons (42-46 kg/ha/year) on the Waza Logone Floodplain. As a result of the SEMRY rice scheme, which included the Maga Dam and the 100 km long containment bank, 964 km² of the Waza Logone Floodplain was lost to the ecosystem, a 30% reduction in flooding with the width of the floodplain on the left bank of the Logone decreasing from 50 to 30 km. This reduced annual flooding from 3,382 to 2,418 km²/year. Fish yields, as a result of this development scheme, were reduced by 90%¹⁵⁸ in the portion of the floodplain taken out of production at an estimated annual loss of Euros 498,500/year (US\$ 588,230/year). Combined with over-fishing as the result of the weakening of traditional controls over access, many Kotoko fishermen left in search of better fishing grounds, moving to Lake Chad, where the reduced level of the lake over the decades has resulted in increased fish biomass concentrated in the remaining area of the lake and/or human-made lakes such as Maga and Lagdo. The number of fishers fell from an estimated 10,000 to 7,000 on the Waza Logone Floodplain (Loth, 2004).

¹⁵⁸ While there was a 30% reduction in flooding, a 90% reduction in fish yields was likely linked to other factors such as the reduced duration of flooding.

Grand Yaéres

On a grander scale, biologists from the Overseas Office for Scientific and Technical Research/*Office de la Recherche Scientifique et Technique Outre-Mer* (ORSTOM),¹⁵⁹ Christiane Leveque and Jacques Quensiére (*pers. comm.*) believed that there would be a regional impact if the Yaéres Floodplain was completely lost, since many areas within the Lake Chad Basin were restocked from the nursery grounds of this floodplain (Table 7.7):

Table 7.7: ORSTOM biologists' projections of fish losses if inundation of Yaéres Floodplain ceased as result of SEMRY rice scheme

AREA AFFECTED	ANNUAL HARVEST (METRIC TONS)	ANNUAL HARVEST IF GRAND YAÉRES FLOODPLAINS LOST COMPLETELY (METRIC TONS)
El Beid (Drains Yaéres towards Lake Chad)	1,400	0
Yaéres	5,700	0
Logone Gana	100	25
Chari Delta (Entrance Into Lake Chad)	2,000	500
Lake Chad	103,400	103,400
TOTAL	112,600	103,925

Note: that the yield of fish from the Yaéres is more than half that projected by Loth (2004) for the Waza Logone portion of the Yaéres.

Source: Principal author, Draft report prepared October 1979 for UNDP sponsored environmental assessment, "Lake Chad Basin Study" (DHV, GFCC & SOGREAH, 1980) with permission, UN & UNDP.

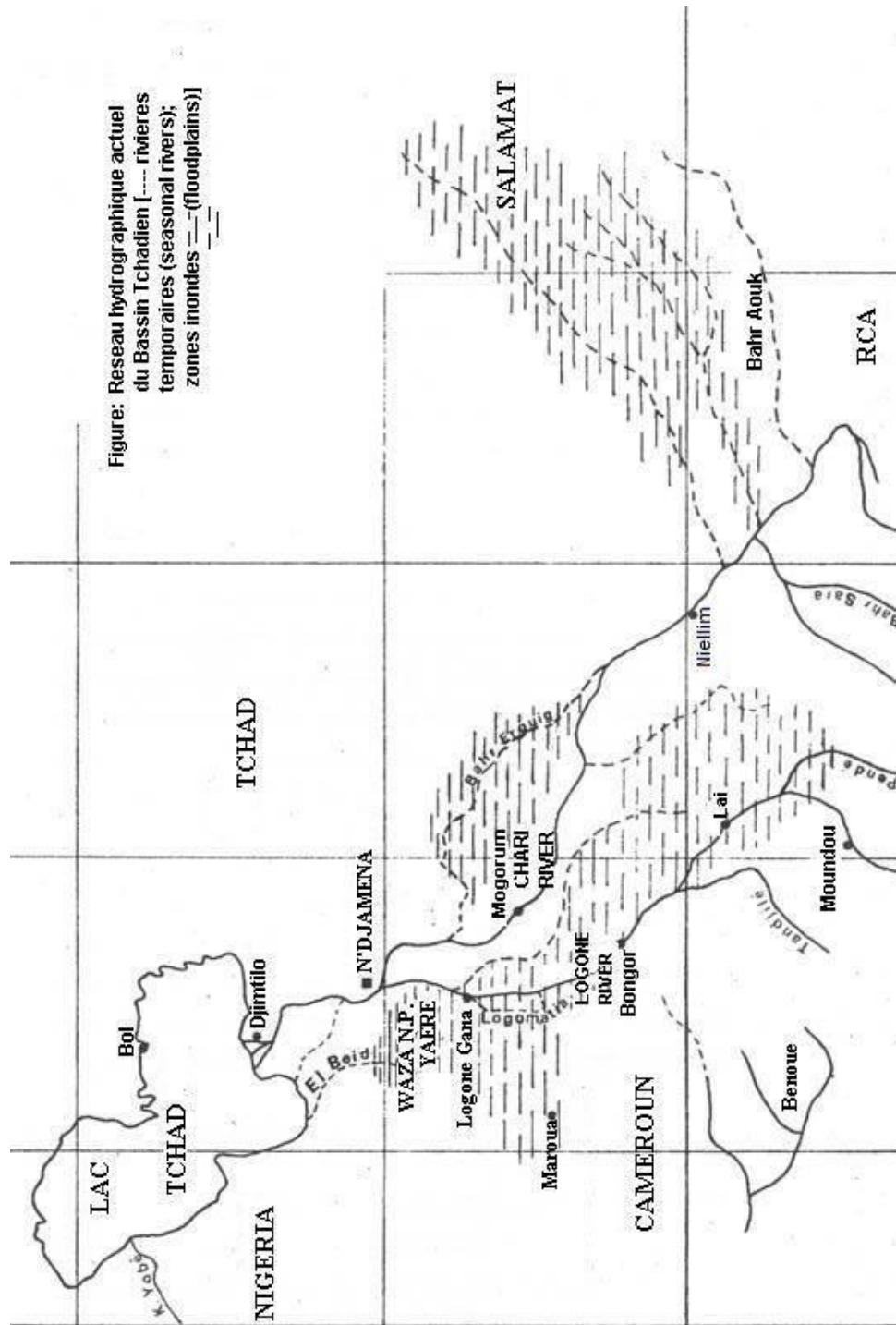
These yields are based on the surface of Lake Chad remaining at 9,000 to 10,000 km² of the early 1970s, while it is known that today the lake is between 5-10% of what it was at that time: a maximum of 1,300 to 2,600 km². The projected loss of fish was based on the ORSTOM biologists' beliefs that loss of the Yaéres

¹⁵⁹ORSTOM today is called: L'Institut de Recherche pour le Développement (IRD), <http://www.ird.fr/>.

Floodplain would cause a disappearance of the migratory *Salanga* fishery of the El Beid, the Chari Delta and main river (Leveque & Quensiere, *pers. comm.*), consisting of the following species whose lives are closely tied to spawning on the floodplains: primarily *Alestes baremose* and *A. dentex*, but also *Schilbe uranoscopus*, *Brachysynodontis batensoda* and *Hemisynodontis membranaceus*) (Benech, 1975) (Figure 7.8).

Lake Chad proper would not be severely impacted, assuming the lake remained at about 9,000 to 10,000 km², since most of its catch is made up of sedentary non-migratory fish species that would make up for loss of the migratory fishery to some degree by increased production primarily from *Tilapia nilotica*, *Clarias*, spp., *Gymnarchus niloticus*, *Heterotis nilotica* (Leveque & Quensiere, *pers. comm.*) and *Synodontis membranaceus* (Blache, *et al.*, 1962).

Benech (1975) demonstrates that initially as the lake dried up, fish catches went up, but as Lake Chad's size decreased, the *prises par unité d'effort*/catch per unit of effort (PUE/CUE) went down, requiring intensified efforts to catch the same quantity of fish. By 1973, the catch per unit of effort was almost zero due to the falling lake levels and the isolation of the lake from the riverine system, implying a drastic decline in catch yields. By May 1973, fishing in the Chari Delta had almost stopped. Fishing in the delta for *Salanga* (*Alestes* spp., etc. migratory floodplain fishery) was primarily done by part time fishermen agriculturists. Fish yields in the delta were estimated to have been 5.5% in 1973 compared to the season of August 1971-July 1972 preceding the drought.



Source: Durand (1977) with permission, UN, FAO & UNDP.

Figure 7.8: Links between Grand Yaéres and other floodplains as a spawning and nursery ground for fish emanating from Lake Chad/Chari Delta

Professional fishermen migrated to the isolated northern basin of Lake Chad, where the *Salanga* were trapped from making their migration up the Chari Logone and El Beid Rivers to spawn on the Yaéres Floodplain. This is the major reason why the *Salanga* fishery showed such high yields in the 1973/74 season. There was, however, a large dieoff of fish in the northern basin from oxygen depletion. The increase in *Banda*, pieces of smoked fish, came 98-99% from the northern isolated sub-basin of Lake Chad. Traditionally, *Banda* would have come from large fish such as *Lates niloticus*, *Bagrus spp.*, *Heterotis spp.* and *Hydrocyon brevis*. However, these species began dieing out from lack of oxygen in much of the lake. By 1975, key species that began taking over under low oxygen conditions were *Tilapia spp.*, *Clarias spp.*, *Polypterus senegalus*, *Brienomyrus niger* and *Alestes nurse*. Only the *Tilapia spp.* and *Clarias spp.* were of economic importance (Benech, 1975).

Concern was raised that loss of other floodplains within the Lake Chad Basin such as the Bahr Egig and Salamat could result in further reductions of fish harvests (Leveque & Quensiere, *pers. comm.*).

The environmental assessment prepared for the UNDP (DHV, GFCC & SOGREAH, 1980) was so concerned for maintaining the Yaéres Floodplain that it stated,

“the importance of the Yaéres to current and future food production in the basin is so great that immediate studies should be made for the purpose of preserving the productive capacity of the Yaéres as long as possible”.

It did not show as great a concern for the continued loss of habitat from the drying up of Lake Chad, a large part due to withdrawal of water in the Lake Chad Basin for irrigation. Once again, a combination of dams and irrigation in the Lake Chad Basin, has not only impacted local floodplain fishery production, but has greatly

diminished the productivity of Lake Chad and the Chari Delta entering the lake that during their peak production are said to have yielded as much as 140,000 metric tons of fish/year in the 1960s. Given the current state of Lake Chad and environs it would be surprising if the reported yield of 60,000 tons/year (Agence Presse France-Press, 1999) is accurate!

The ORSTOM biologists¹⁶⁰ also believed that some of the projected losses in fish production could be made up by better handling, storage and preservation of fish. Due to poor smoking, drying and storage techniques, an average loss of 25% of the processed fish occurs between the fishing village and markets, while another 25-50% of the fish are lost between the point of capture and arrival in the villages (Leveque & Quensiere, *pers. comm.*). Fish culture was discussed, but this could never mitigate the loss of a natural fishery.

7.8.6.6 Kainji Dam, Nigeria

Downstream fish catches on the Niger River fell by 60-70% (Awachie & Walson, 1978 *In: Läe, et al.*, 2003; McCully, 2001).

7.8.6.7 Aswan High Dam, Nile River, Egypt

Fish species north of the dam in the river declined from 71 to 31 species once the dam was in place (Kapetsky & Petr, 1984). Abdel-Latif (1984 *In: Kapetsky & Petr*, 1984) states that downstream of the dam in the freshwater portion of the river, regulation of flow and loss of silt created lentic (lake-like) conditions in which phytoplankton production increased, favoring a change in species, where *Tilapia*, especially *T. nilotica* went from 25% of the catch by species before the construction of the high dam to 75% of the catch after the high dam was built, and from an average of 3,500 tons between 1958-64 before the dam was built to 9,000

¹⁶⁰ Christiane Leveque and Jacques Quensiere

tons in 1979 after completion of the dam. The Aswan High Dam was completed in 1970. This is quite surprising since the history of dams on downstream freshwater floodplain fishery production has been negative. As is seen below, it appears that the biggest impact of the Aswan High Dam is on the estuarine/marine sardine fishery (Section 7.8.7.6, Nile River, Aswan High Dam).

7.8.6.8 Inner/Central Delta, Niger River, Mali

The floodplains of the Central (Inner) Delta of the Niger River in Mali, linked historically to many of Sub-Saharan Africa's ancient civilizations (see Chapter 1), covers 20,000 km². As discussed in Chapter 2, it is a lifeline to local people in the production of fish, livestock and agriculture as are most floodplains in Africa. The Inner Delta contains 70% of the country's best agricultural land (for the most part irrigated), 50% of the nation's cattle and produces 80% of the fish caught in Mali. In short, the Central Delta is one of the main centers of production and export (mainly to Ghana and the Ivory Coast) of primary products from the Sahel (IFAD, 1999).

Drought and reduced flow affecting flood peaks have impacted on fish production and yield. In the case of the Central or Inner Delta of the Niger River, it appears that natural fluctuations in flow are still more relevant than modification of the downstream flow from dams (Laë & Mahé, 2002 *In: Läe, et al.*, 2003).

The fisheries of the Upper and Middle Niger River were deeply modified from 1950 to 1990 by two consecutive drought periods, dams and a rapid increase of fishing activities, readily observable in the Central Delta. From 1969-1986, floodplain areas contracted from 20,000 km² to 5,000 km², resulting in a decrease in annual yield/catch of fish from 90,000 metric tons to 45,000 metric tons (Läe, *et al.*, 2003). Furthermore, the Markala Dam, downstream of Bamako, Mali, built

in 1943 for the *Office du Niger* for irrigation (see Chapter 5, Section 5.12.1.3, Irrigation potential) and the Selengue Dam, a 400 km² hydro-electric dam upstream of Bamako, Mali, contribute to increase the effects of drought by further lowering the already reduced flood flows. As a result, the annual loss in total fish catches in the Central Delta is estimated to be 5,000 metric tons (Laë, 1992 *In: Läe, et al.*, 2003) attributable to these dams that contributes to the reduced catch of 45,000 metric tons.

The dams also affect upstream fish production by disrupting longitudinal migrations of fish.

“Another factor responsible for the decline in fish stocks is watershed degradation as a result of the combined effect of drought and human activities (itinerant agriculture, over-grazing, illegal cutting of wood). In Niger, this results in an increase in erosion and higher silt loadings, which, in turn, leads to formation of considerable sandbanks. Muddy habitats are destroyed, water volume is reduced and water quality deteriorates, as indicated by a high turbidity and low dissolved oxygen concentration” (*Läe, et al.*, 2003).

In the 1990s, migrant fishermen accounted for 59.2% of the Central Delta catch followed by sedentary fishermen (36.1%) and farmers/fishermen (4.7%). Seventy-six (76) species were registered in the fish landings, of which 17 species accounted for 85% of the fish landings. Fishing was mainly conducted by fixed and drift gill nets (40%), small traps (15.7%), cast nets (14.9%), multi-hook lines (10.6%) and large (7.8%) and small seines (4.3%) (*Läe, et al.*, 2003). Key species included Cichlidae with 26.6% of the catch, *Oreochromis niloticus* (10.2%), *Tilapia zilli* (8.3%), *Sarotherodon galilaeus* (6.2 %), *Oreochromis aureus* (1.9 %), and Clariidae with 18.7% of the landings (*Clarias anguillaris*) (*Läe, et al.*, 2003).

Fishing pressure has increased significantly over the years due to increases in the number of fishermen from 70,000 Bozos and Somonos in 1967 (Gallais, 1967 *In: Läe, et al., 2003*) to 80,000 in 1975 (Natural Resources And Breeding Ministry, 1975 *In: Läe, et al., 2003*), and 225,000 by 1987, of which 62,000 were active fishermen (Quensiére, 1988; Morand, Quensiére & Herry, 1990 both *In: Läe, et al., 2003*).

Fish yields have increased from 40 kg/ha in 1968 to 120 kg/ha in 1990 due to increased catches resulting from a shift to younger and smaller fish (e.g., opting for biomass versus size) from more intense fishing (Laë, 1995 *In: Läe, et al., 2003*), increased fishing pressure, an increase in fish concentration on reduced floodplains, an increase in intra and inter-specific fish competition and an increase in vulnerability to fishing equipment (Läe, *et al.*, 2003).

With the return of more regular flooding in the mid-1990s, annual yield/catch is averaging about 100,000 metric tons/year at the gross added value of about 30 billion CFA (US\$ 60 million/Euros 46 million)/year, the whole fishing networks contributing approximately 4.2 % to the gross domestic product (GDP) of Mali. The fishery employs 284,000 people, including 71,000 directly for production (Läe, *et al.*, 2003).

7.8.7 Dam Impacts on Estuarine and Marine Fisheries

Freshwater flows also help support marine fish production, as many marine fish spawn in the brackish waters of estuaries or deltas, whose salinities range between seawater (35 ppt.) and freshwater. A decrease in freshwater flow and in nutrients due to dam construction affects the nursery areas in a number of ways, including increasing salinity, allowing predatory marine fish to invade and reducing the available food supply (WCD, 2000). Linked to the aquatic food chain, mangrove ecosystems can also be adversely impacted.

7.8.7.1 Senegal River

Traditionally, before the construction of the Manantali and Diama Dams, with the receding waters of the rainy season, a salt wedge developed, moving up the river from the mouth as far as the Doué *Marigot* at Podor, 320 km upstream from the river mouth (Figure 7.4). The estuarine conditions created by this phenomenon were critical to fishes whose life cycles were tied to the salinity regime. These fishes included important species such as *Ethmalosa fimbriata* (African shad), *Tilapia guineensis*, *Sarotherodon melanotheron heudelotii*, *Mugil spp.*, and *Lisa spp.* The African shad, while only a small contributor to the commercial marine fishery, was important in the artisanal fishery at the mouth of the Senegal River. Invertebrates whose life cycles are tied to estuarine conditions include the crab, *Callinectes spp.*, and the shrimp, *Penaeus duorarum notialis* (*Penaeus notialis*) (GFCC, 1980a; 1980b).

The Manantali Dam affected these vital functions and reduced fishing significantly. Even fishing families are reported to eat imported fish now. The hydropower project will further impair fisheries in the floodplain and the coastal sea (Bosshard, 1999).

Fish production in the river and estuary has dropped by 90% (GEF, 2002). This implies that estuarine yields of fish after construction of the dams would have dropped to about 1,140 tons/year based on a pre-dam yield of 11,400 tons/year (GFCC, 1980b) (see Table 7.5).

This loss has been very extreme in the formerly estuarine part downstream of Diama and this has probably also impacted on marine fisheries through the loss of nursery functions for mullets (Mugilidae), shrimp (Penaeidae), shad (*Ethmalosa*

fimbriata) and other species having an obligatory estuarine life history stage (Hamerlynck, *et al.*, 2000).

According to Kloff (2002), the area most ignored for its need for fresh water is the area lying downstream of the Diama Dam. This former estuary lies outside the target area of the OMVS and is therefore more or less considered as a dumpsite for water that needs to be released during the wet season. Before the construction of this anti-salt barrage, the area was nevertheless of great economic importance as a nursery ground for numerous commercial marine fishes that spent part of their life cycle in the brackish estuary. Traditionally to spawn, mullets migrated at the beginning of each early dry season from the Banc d'Arguin National Park in the north of Mauritania to the Senegal River Delta (Kapetsky, 1981 *In:* Binet, LeReste & Diouf, 1994; Kloff, 2002) and to coastal lagoons (Kapetsky, 1981 *In:* Binet, *et al.*, 1994). In the sixties, abundant juvenile mullets were observed by a team of French and Mauritanian researchers at Rosso lying 80 km upstream of the present Diama Dam, which is 27 km upstream from St Louis near the mouth of the river – thus 107 km upstream from the river mouth. With the Diama Dam, the nursery area became greatly reduced due to the obstacle the dam posed for the migration of marine fishes and even worse the remaining area downstream of the dam deteriorated as a nursery due to a lack of fresh water and resulting hypersaline conditions (Kloff, 2002).

During the dry season, no freshwater was released by Diama into the former estuary, which became gradually hypersaline in the course of each dry season (Kloff, 2002). Juvenile fishes died due to the high salinity. Ten years after the construction of the Diama Dam, the mullet fishery sector - a multimillion-dollar business through the export of eggs (*poutargue*), a form of caviar, to Southern Europe – off the Atlantic coast of Mauritania completely collapsed. Although over-fishing is believed to be one of the major factors, the deterioration of the

former estuary is believed to have significantly contributed to the catastrophe (Kloff, 2002).

Kloff and Pieterse (2002) note that park rangers from the Diawling Park, south of Diama, are still observing several age groups of mullet downstream of the Diama Dam. These are, however, less abundant than in the sixties (Kloff, 2000). The mullet will never reach Rosso again because the dam is blocking their migration route, while the remaining habitat for mullet is not only much smaller but also of inferior quality compared to the pre-dam era, becoming hypersaline during the dry season. Today, young mullet cannot achieve adulthood and the stock at sea as a consequence is no longer significantly replenished.

According to Binet, *et al.* (1994), the anti-salt barrage, designed to preserve agricultural land from salty water and to make it irrigable, blocks the outflow of freshwater to the sea except during the heaviest flooding. The Diama also prevents migrations of anadromous¹⁶¹ species (e.g., mullet, shrimp and shad) and particularly the upstream movement of euryhaline¹⁶² species (e.g., shrimps, crabs and oysters). The freshwater species carried down toward the estuary by the floodwaters will no longer reach their destination and catadromous¹⁶³ species will be unable to spawn in the brackish waters. Major mortalities of migratory species are observed at certain times. However, the feared elimination of the bonga/shad (*Ethmalosa fimbriata*), *Callinectes* (crab) and the pink shrimp in the Senegal River estuary did not take place. Lastly, the irregular nature of water releases and hence of downstream phytoplankton surges have increased the “unpredictable” nature of this environment, favoring colonization by opportunistic species of low

¹⁶¹Anadromous fish species spend their adult lives in the sea but swim upriver to freshwater spawning grounds to reproduce

¹⁶²Euryhaline species live in a wide range of salinities as opposed to stenohaline species restricted to a narrow range of salinities

¹⁶³Catadromous fish species migrate from fresh water to saltwater to spawn

commercial value. Indeed, an increase in the relative numbers of *Tilapia* and mullet has been observed.

There seems to be some contradiction. However, this is not believed to be the case if one looks at what happened as a result of the 1970s drought in the creation of “natural” hypersaline conditions in the Siné Saloum and Casamance Estuaries (see Section 7.9.7.3, Hypersalinity, the evolution of mangroves in West Africa and its effects on fish stocks – case studies of the Casamance and Sine Saloum Estuaries). In the Siné Saloum Estuary, just north of the Gambia River and south of the Senegal River, where hypersaline conditions appeared to favor *Ethmalosa*, mullet and *Tilapia* over other species, there still was a major reduction in artisanal catches, including these species, during the drought period of the 1970s/early 1980s. Fish catches in the Department of Kaolack – Siné Saloum fell from a high of 4,000 metric tons in 1975 to a low of about 1,000 metric tons/year in the early 1980s. It should be noted that even though dominant in the catch, the *Ethmalosa* yields dropped from a high of 829 tons in 1975 to a low of 40-70 tons in the early 1980s in the Siné Saloum. Mugil species, likewise, while relatively speaking surviving the hypersaline conditions, dropped from a peak of 1,070 tons in 1975 to lows of 200-300 tons/year in the early 1980s in the Siné Saloum (DeGeorges, 1985). This also appeared to be the case for the Casamance Estuary just south of the Gambia River (DeGeorges, 1985) where the same three genera were dominant and where these species became dominant as one moved upstream towards more hypersaline waters, in places exceeding 170 ppt. (parts per thousand), the sea being 35 ppt. The Bas Delta study before the Diama Barrage, but impacted by the drought, showed similar results. With the drought and increasing hypersaline conditions, most species fell out of the catches, with the dominant ones being (DeGeorges, 1984):

- The African shad, *Ethmalosa fimbriata*
- *Tilapia/Sarotherodon*
- *Penaeus notialis*, etc – shrimp
- Two species of mullet (Mugilidae)

These are the same three genera/families of fish that became dominant in the Casamance and Sine Saloum.

7.8.7.2 Gambia River

There is a strong risk that a coastal/estuarine fishery yielding about 23,000 metric tons/year valued at Dalasis 66 million (US\$ 11 million)/year at mid-1980 conversion rates would be significantly degraded as an exploitable resource as a result of the Balingho Anti-Salinity Barrage. An estimate of 33 species of fish and shellfish, which comprise the majority of the fishery off the Gambia, are dependent, directly or indirectly, on the mangrove ecosystem and associated detrital food chain at critical stages of their life cycles (Table 7.8):

Table 7.8: Summary of fish and shellfish of the Gambia River whose life cycles are tied to estuarine mangrove ecosystems

Fishery	Percent Of Fishery By Weight Tied To Estuary/Mangrove	Percent Of Fishery By Value Tied To Estuary/Mangrove
Artisanal	96	88
Industrial	86	99.6
Shellfish	84	94

Source: DeGeorges (1987c)

A detailed list of species with life cycles tied to the estuary is contained in the Tables 7.9 and 7.10.

Table 7.9: Known ties of commercially important finfish species to the Gambia River Estuary

Life Cycle Completed At Sea	Life Cycle Completed At Sea Occasional Visitor To Estuary	Spawn At Sea Young Use Estuary	Life Cycle Tied To Estuary, Details Little Understood	Spawn In Estuary And Use Estuary As Nursery
Sardinella aurita Galeorhinus galeus Pteronyxlaeus bovina Rhinobatos cemiculus Torpedo marmorata Trachurus spp. Plectrohinchus (Plectrohinchus) mediterraneus Argyrosomus regius Balistes spp. Dentex spp.	Carcharhinus (<i>Carcharhinus</i>) limbatus Dasyatis marginalis Gymnura microtura Sphyraena gnathancio Synaptura lusitanica Caranx senegalensis Drepane africana Epinephelus aeneus	Sardinella maderensis Ethmalosa fimbriata Pseudotolithus elongatus P. typus Pomadasys' jubelini Arius heudeleti	Citharichthys stampfii Cynglossus senegaleensis Chloroscombrus chrysurus Trachinotus terzia Hemicaranx bicolor Polydactylus (<i>Polydactylus</i>) quadrifilis Pseudotolithus senegalensis P.(Brachygynathus) senegalensis Sphyraena sphyraena Polydactylus quadrifilis Liza falcipinnis Galeoides decadactylus	Ethmalosa fimbriata Sarotherodon melanotheron <i>Hemichromis fasciatus</i>

Source: DeGeorges (1997d)

Table 7.10: Known ties of commercially important shellfish species to the Gambia River Estuary

Life Cycle Completed At Sea	Life Cycle Completed At Sea Occasional Visitor To Estuary	Spawn At Sea Young Use Estuary	Life Cycle Tied To Estuary, Details Little Understood	Spawn In Estuary And Use Estuary As Nursery
<i>Palinurus mauritanicus</i> (Spiny Lobster) <i>Palinurus regius</i> <i>Scyllarides latus</i> (Cigale de mer/Slipper Lobster) <i>S. herklotsii</i> (Cigale Rouge/Red Slipper Lobster) <i>Cymbium cymbium</i> (Yeat) <i>C. glans</i> <i>C. pep</i>	-----	<i>Penaeus notialis</i> (Shrimp)	<i>Sepia officinalis</i> herredda (Cuttle Fish)	<i>Crassostrea gasar</i> (Oyster)

Source: DeGeorges (1987d)

A major decline in these fisheries would be expected as a result of the Balingho Barrage. The Sine-Saloum Estuary in the Department of Kaolack, Senegal, and the Casamance Estuary in the Department of Sedhiou, areas affected by extreme hypersaline conditions - as is projected downstream if the Balingho Barrage is constructed - have seen a major reduction in annual yield/catch by as much as 75% and a major fall off in fish diversity (see Section 7.9.7.3, Hypersalinity, the evolution of mangroves in West Africa and its effects on fish stocks – case studies of the Casamance and Sine Saloum Estuaries) (DeGeorges, 1985; 1987d).

The species of fish affected by these hypersaline conditions in the Casamance and Sine-Saloum Estuaries are the same as most of the species currently important to the Gambian fisheries.

Binet, *et al.* (1994) predict that as a result of the Balingho Barrage, if the mangroves were lost as a source of the detrital food chain, plus as a nursery for shrimp, “the shrimp fishery can expect to see favorable initial trends (larger seaward-migrating shrimp) but the final result could be a reduction in the stock due to a shrinking adult habitat (river-exported muddy areas) and a drop in post-larval recruitment, as it seems unlikely that the post-larval stages could reach the river mouth unguided by a falling salinity gradient”. Van Maren (1985 *In:* DeGeorges, 1985) estimates a 10% decline of Gambia’s shrimp fishery, from the loss of mangroves upstream of the Balingho Barrage and, personally, the principal author believes this to be a low estimate, as this is in one of the more productive mangrove zones. It is estimated that an additional 40% of the annual shrimp harvest, in addition to oyster, crab and lobster production, could be lost below the barrage. The total loss of fresh and estuarine fish/shellfish above and below the barrage as a result of its impact on the environment was estimated at US\$ 1,400,000/year (University of Michigan, 1985a).

It is also unclear what the effects of hypersalinity and loss of estuarine habitat could have on offshore fish stocks, which have indirect ties to the estuary through the food chain.

Making exact quantitative predictions for each species is impossible due to the complexity of their life cycles, of which very little is known. However, based on a risk analysis of what is known, from the impacts of the Diama and Kheune¹⁶⁴ Barrages on the Senegal (DeGeorges, Sy & Ould Mbare, 1985) and the impacts of hypersaline conditions in pre-Diama in the Bas Delta Mauritania, Siné Saloum and Casamance Estuaries on fish diversity and yields, one would have to question the wisdom of the Balingho with regards to the fisheries.

The potential losses could never be made up with the projected 4-6,000 metric tons of fish that might come out of the Balingho Reservoir (see projections above in Table 7.3). Projected water quality problems with acidity, oxygen and salinity within the reservoir could drastically reduce these optimistic projections.

The University of Michigan (1985a) study estimates only a loss of 10% of the ocean fisheries and 30% of the estuarine fishery, even though they came up with a somewhat lower (than in Table 7.8) but still important estimate that 60% of the 1981 marine coastal catch was composed of species with their life cycles tied to the lower and upper estuaries. No explanation was given in either this report or the aquatic ecology report (University of Michigan, 1985b) at how they arrived at this estimate, but in the Water Resources Report they go on to admit that “the full extent of the impacts of the dam (Balingho) on the marine and estuarine fisheries remains to be determined”. The way forward is simple. After the catastrophic result from the Diama Anti-Salinity Barrage on the fisheries in nearby Senegal and the adverse impacts on the fisheries from hypersalinity in the Siné Saloum

¹⁶⁴ Year classes of fish as they moved up river to spawn were stopped by the barrage and then fished out with seines.

and Casamance caused by the drought, if there are other alternative development options without the Balingho Anti-Salinity Barrage, that is projected to have similar impacts, these should be considered. Why take the risk of destroying an entire ecosystem and food source?

Although exact change is difficult to quantify, this analysis led to the conclusion that if other development options existed that do not include the Balingho Anti-Salinity Barrage, but which permit the achievement of development goals, it would be best to abandon all options which contain Balingho in order to minimize the risk to the estuary and its natural resource base (University of Michigan, 1985b; Samba & DeGeorges, 1987a.) The University of Michigan (1985a) study found the Balingho to be neither economically nor environmentally viable.

7.8.7.3 Hypersalinity, the evolution of mangroves in West Africa and its effects on fish stocks – case studies of the Casamance and Siné Saloum Estuaries

This analysis can be used to obtain an idea of what might happen if the construction of the Balingho Barrage or similar anti-salinity barrages on other rivers, along with flow regulation from high dams significantly modifies estuarine conditions, resulting in reduced flushing, hypersalinity and mangrove dieback.

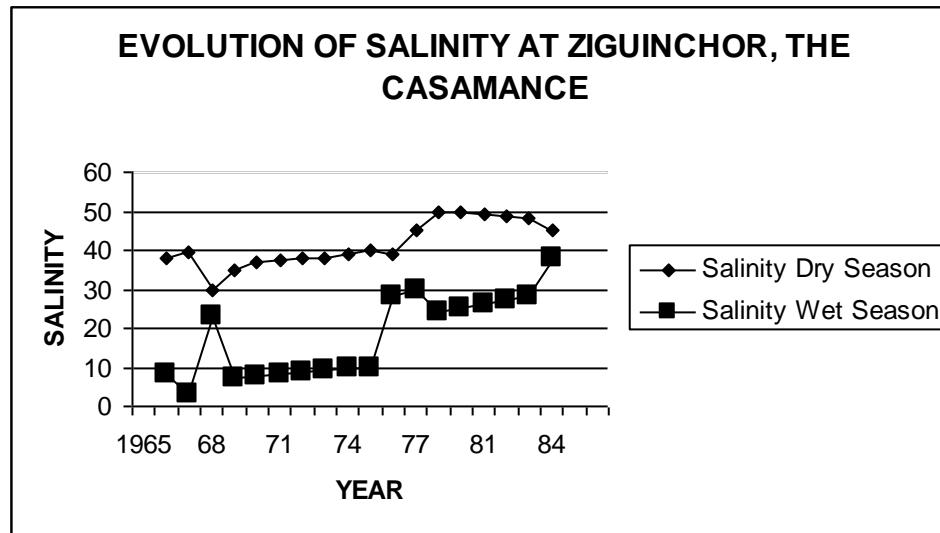
An important effect of decreased regional rainfall and decreased freshwater flushing in the 1970s and early 1980s was an increase in year-round salinities. Normal seawater contains a salinity of 35 ppt. The Casamance Estuary just south of the Gambia River and the Siné-Saloum Estuary, just north of the Gambia River have traditionally experienced the phenomenon of hypersalinity; salinities greater than 35 ppt.

For instance in the late 1960s, salinities as high as 93 ppt. at Fatick and 72 ppt. at Kaolack in the Siné Saloum were recorded (Bondy, 1968 *In:* DeGeorges, 1985). In the mid-1960s, salinities at Ziguinchor, the Casamance, climbed as high as 40 ppt. by the end of the dry season (LeReste & Odinetz, 1984 *In:* DeGeorges, 1985). These hypersalinities developed as a result of poor flushing by freshwater during the dry season combined with high evaporation.

Prior to the 1970s drought, yearly rainfall flushed these estuaries, resulting in a large dip in salinity during the rainy season.

Up until 1969, the estuary of the Casamance (just south of the Gambia River in Senegal), a long (230 km) and narrow (1 to 10 km wide) channel with a very low rate of flow (average 1968–1983: $2.7 \text{ m}^3/\text{s}$), was only very slightly hypersaline (40 ppt. in June, at 80 km from the mouth) (Binet, *et al.*, 1994) (Figure 7.3)

In the mid-1960s, the Casamance experienced salinities as low as 3 ppt. at Ziguinchor near the mouth of the Casamance. However, with increasing drought and possibly watershed degradation, this water body became increasingly saline (Figure 7.9).

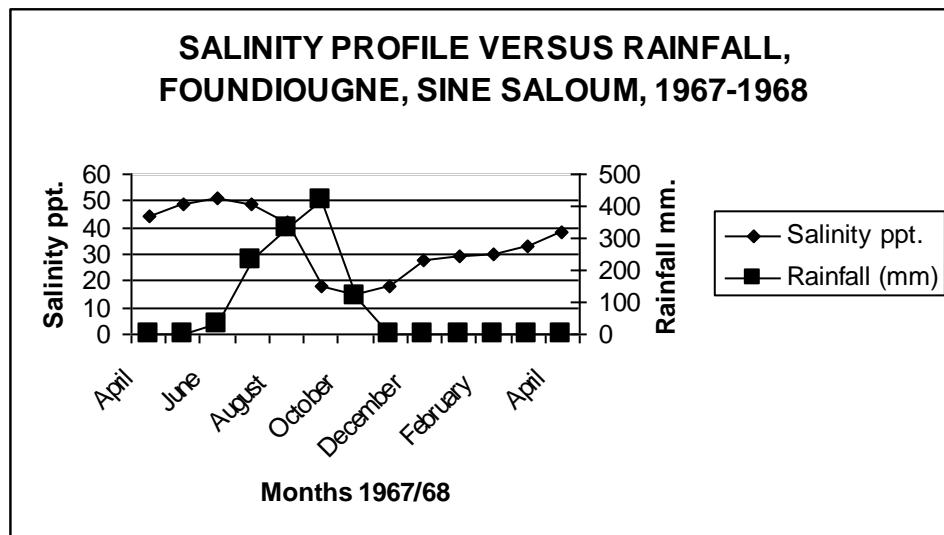


Source: Extracted from: LeReste & Odinetz (1984 *In: DeGeorges, 1987d*)¹⁶⁵ with permission, *Centre de Recherche Oceanographique Dakar/Tiaroye* (CRODT).

Figure 7.9: Evolution of salinity at Ziguinchor, the Casamance, Senegal

During the same time, the Siné Saloum (an estuary just north of the Gambia River in Senegal), as measured at Foundioune, experienced salinities which fell as low as 15 ppt. (Figure 7.10).

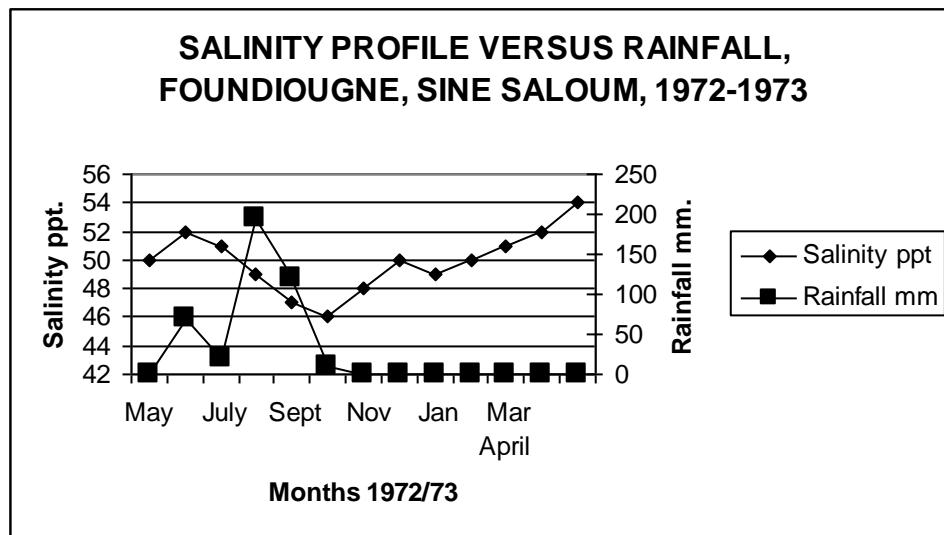
¹⁶⁵ Note: 1971, 72, 73, 74, 77, 79, 80, 81 not shown on original graph - guessed to get line hook-up as shown on original graph



Extracted from: L'Homme (1980 In: DeGeorges, 1987d) with permission, *Institut de Recherche pour le Développement* (IRD).

Figure 7.10: Salinity profile versus rainfall, Foudiougne, Siné Saloum, Senegal, 1967-1968

During the drought years (1970s and early 1980s), there was very little flushing of these estuaries by fresh water during the rainy season. The most important flushing that occurred was tidal in nature. In the upper reaches of these estuaries, flushing was inadequate and evaporation rates were high. As a result, there was a tendency for the annual salinity curves to flatten out in the upper reaches of what has become in essence an extension of the ocean. Salinities had a tendency to remain high year round and in some instances to have increased (see Ziguinchor Graph, Figure 7.9 and Siné Saloum Graph Figure 7.11).



Extracted from: L'Homme (1980 *In: DeGeorges, 1987d*) with permission, IRD.

Figure 7.11: Salinity profile versus rainfall, Siné Saloum, Senegal, 1972-1973

In the Casamance, where salinity did not exceed 1 ppt. in 1969, it reached 70 ppt. in 1984. At the end of the 1986 dry season, salinity reached 170 ppt. at a location 220 km from the sea. During periods of drought, the Casamance Estuary exhibits a very slow “reverse estuarine” circulation which acts more as a confining mechanism than anything else (Binet, *et al.*, 1994).

Unfortunately, such records do not exist from the early part of the century for comparative purposes. However, the result of this long-term phenomenon has been to gradually reduce mangrove stands in West Africa over the last century. This can be tied to the drought and to the southward movement of the Sahel. The role of humans and their effects on land use and thus watersheds draining into these mangrove swamps and the contribution this may have on the regional degeneration of the mangroves from modification of local or basin-wide hydrology cannot be ignored (see below: Mangrove Dieback, Hypersalinity, Flow and the Shrimp Fishery).

What cannot be determined is to what degree the drought is cyclical and to what degree rains or drought may dominate over a reasonable planning horizon of the next 50 years. Proper planning may go a long way in minimizing the anthropogenic effects on this important resource/ecosystem.

It is known that in those estuaries where major mangrove dieback and hypersalinity have occurred in the Casamance and Siné-Saloum, there has been a major decrease in fish and shrimp yields and in species richness (see Tables 7.11 and 7.12, and Figure 7.12). In addition to a decline in the detrital food chain from the dieback of mangroves, so necessary for food production, the increasingly hypersaline year-round conditions physiologically stress the fish stocks.

The same genera and in many cases the same species of fish dropped off from what appear to be hypersaline conditions in both the Siné Saloum (Table 7.11) and the Casamance (Table 7.12), the former being documented temporally over a 13 year time frame spanning the last major drought. In the Department of Kaolack area of the Sine Saloum, this resulted in a diverse fish catch of 13 genera declining to three genera/families (Table 7.11):

- *Mugil spp.*
- *Tilapia/Sarotherodon spp.*
- *Ethmalosa fimbriata*

Table 7.11: Annual fish catches in metric tons by species, Department of Kaolack, 1972-1984

Common Name	Scientific Name	Metric Tons Per Year Fresh Fish										1984 Jun-Aug
		1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	
Brochet	<i>Sphyraena</i> sp.	59.6	69.4	25.4	53.6	20.3	40.7	28.0	0.6	2.4	0.2	0
Capitaine	<i>Polydactylus quadrifilis</i>	2.3	18.3	23.3	65.0	0	0	0	0.7	6.3	0.0	0
Pristipome	<i>Parapristipoma octolineatum</i>	0	19.9	34.3	27.5	1.5	31.8	10.5	1.0	6.4	1.0	0
Carengue	<i>Caranx</i> spp.	16.7	77.6	13.2	27.2	2.8	1.8	7.0	0.7	1.8	0.3	0
Grande Otolithe	<i>Pseudotolithus brachynathus</i>	5.7	25.8	22.2	79.2	12.6	23.8	19.9	2.5	0.3	0	0
Otolithe main	<i>Pseudotolithus senegalensis</i>	33.2	51.2	82.7	212.2	11.1	25.8	37.9	0	0.1	0.1	0
Silure	<i>Arius</i> spp.	0.0	12.1	0	0	0	0	3.8	0.1	0	0	0
Mulet	<i>Mugil</i> spp	127.0	322.7	514.8	1,070.0	598.0	780.6	377.2	1.59.	210.2	155.	258.7
Tilapia	<i>Tilapia</i> spp.	112.4	362.6	877.8	1,491.3	633.8	888.5	379.1	109.	626.7	3	1
Sardinella	<i>Sardinella</i> spp.	4.0	0	26.8	0	0.7	0	0	0	0	0	0

Table 7.11 (Cont.): Annual fish catches in metric tons by species, Department of Kaolack, 1972-1984

		Metric Tons Per Year Fresh Fish											
Common Name	Scientific Name												
Ethmalosa fimbriata	<i>Ethmalosa fimbriata</i>	136.7	118.3	338.4	829.0	159.9	481.0	356.0	6.2	51.4	22.7	72.5	39.6
Albulidae	<i>Albulidae</i>	4.3	62.1	31.1	68.7	35.8	57.6	26.4	3.0	9.0	1.1	0	1.8
Carpe ronge	<i>Lutjanidae</i>	0	27.5	45.8	16.9	1.4	1.0	0	0	0	0	0	0
Maquereau bonite	<i>Scomberomorus tritor</i>	0	5.4	0	0	0.2	0	0	0	0	0	0	0
Drepane	<i>Drepane africana</i>	0	94.9	2.3	0	0	0	0	0	0	0	0	0
Sole	<i>Soleidae/ Cynglossidae</i>	0	94.7	0	0	0	0	0	0	0	0	0	0
Bar-tache	<i>Bathyteuthis abyssicola</i>	0	0	0	0	0	0	0	0	0	0	0	0
Crevette (Shrimp)	<i>Penaeus notialis</i>	0	0	0	0	0	1.5	0	0	0	0	0	0
TOTAL		501.9	1,365.5	2,038.1	3,940.1	1,478.1	2,302.6	1,247.3	283.8	914.8	820.4	1,022.7	810.3
Months Missing Data	Oct, Nov, Dec	Apr, Jul, Aug, Sept	Compl ete	Feb	Complete	Complete	June	Jul.	Complete	Apr.	Dec.	Complete	Complete

Source: Collected By P.A. DeGeorges from fish catch records, Direction de la Peche, Kaolack, El Hadj Cisse, Directeur, et Delphine Wade, Statistician. (DeGeorges, 1985 In: DeGeorges, 1984)

Table 7.12: Relative abundance of fish species related to salinity, Casamance, Senegal

Distance From River Mouth (km)	Site & Salinity Ranges (ppt.) – March 1984						
	25-30	60-62	110	116	156	168	200
Species	Pointe St Georges 38-46 ppt.	Ziguinchor 54-56 ppt.	Goudoump 66 ppt.	Marsassoum 76 ppt.	Simbandi-Brassou 78 ppt.	Sedhiou 82-83 ppt.	Mankono-Ba 81 ppt.
<i>Drepane africana</i>	X****	X*	-	-	-	-	-
<i>Ethmalosa fimbriata</i> (Clupeidae)	X****	X****	X****	X***	X**	X*	-
<i>Dasyatis margarita</i>	X***	-	-	-	-	-	-
<i>Rhinobatos rhinobatos</i>	X***	-	-	-	-	-	-
<i>Pseudotolithus typus</i>	X***	-	-	-	-	-	-
<i>Arius gambensis</i>	X***	X****	X*	-	-	-	-
<i>Galeoides decadactylus</i>	X***	X**	-	-	-	-	-
FMA (?) Species?)	X***	X*	X*	-	-	-	-
<i>Cynoglossus senegalensis</i> (goreensis)	X***	X*	-	-	-	-	-
<i>Liza grandisquamis</i> (Mugilidae)	X***	X***	X*	-	-	-	-
<i>Liza falcipinnis</i> (Mugilidae)	X***	X***	X***	X**	X***	X***	-
<i>Gerres melanopterus</i>	X***	X***	X*	-	-	-	-
<i>Pomadasys jubelini</i>	X***	X**	-	-	-	-	-
<i>Arius heudelotii</i> (mercatoris)	X**	X**	-	-	-	-	-
<i>Pseudotolithus brachygnathus</i>	X**	X**	X*	-	-	-	-
<i>Ilisha africana</i>	X**	X*	-	-	-	-	-
<i>Mugil bananensis</i> (Mugilidae)	X**	X**	X**	-	-	-	-
<i>Polydactylus quadrifilis</i>	X**	X***	-	-	-	-	-
<i>Sarotherodon melanotheron</i> (Cichlidae)	X**	X****	X****	X*****	X*****	X*****	X*****

Relative Abundance: Very Abundant: ***** To Low Abundance: *, Not Present: -

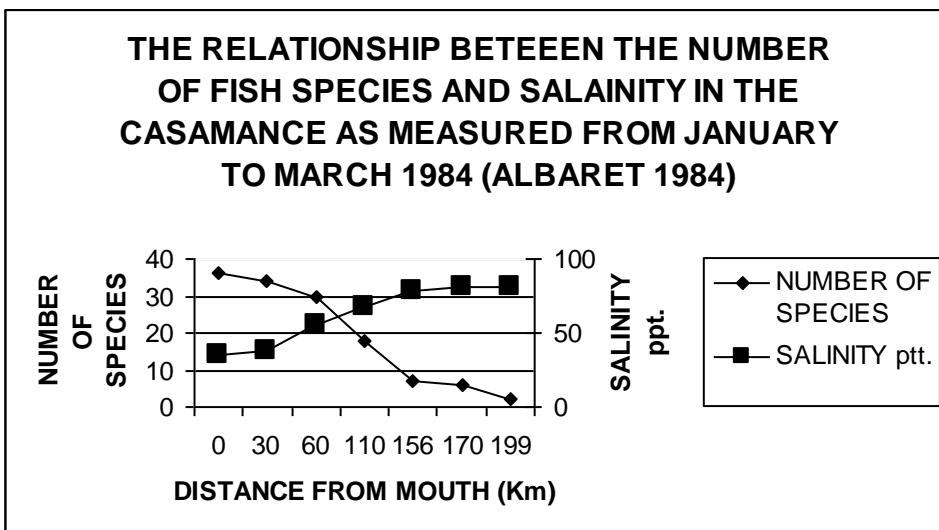
Source: Extracted from Albaret (1984 In: DeGeorges, 1985) with permission, CRODT & Albaret.

Table 7.12 (Cont.): Relative abundance of fish species related to salinity, Casamance, Senegal

Distance From River Mouth (km) Species	Site & Salinity Ranges (ppt.) – March 1984						
	25-30 Pointe St Georges 38-46 ppt.	60-62 Ziguinchor 54-56 ppt.	110 Goudoump 66 ppt.	116 Marsassoum 76 ppt.	156 Simbandi -Brassou 78 ppt.	168 Sedhiou 82-83 ppt.	200 Mankono- Ba 81 ppt.
<i>Tilapia</i> <i>guineensis</i> (Cichlidae)	X**	X**	X**	X**	X**	X**	-
<i>Gerres nigri</i>	X**	X**	X**	X**	X*	-	-
<i>Caranx hippos</i>	X*	-	X*	-	-	-	-
<i>Ephippion</i> <i>guttifer</i>	X*	-	-	-	-	-	-
<i>Trachinotus</i> <i>falcatus</i>	X*	-	-	-	-	-	-
<i>Plectorhinchus</i> <i>macrolepis</i>	X*	X*	X*	-	-	-	-
<i>Sphyraena</i> <i>piscatorum</i>	X*	X*	X*	-	-	-	-
<i>Scomberomorus</i> <i>tritor</i>	X*	-	-	-	-	-	-
<i>Lagocephalus</i> <i>laevigatus</i>	X*	-	-	-	-	-	-
<i>Pseudotolithus</i> <i>elongatus</i>	X*	X*	X*	-	-	-	-
<i>Chaetodipterus</i> <i>lippei</i>	X*	-	-	-	-	-	-
<i>Psetta sebae</i>	X*	-	-	-	-	-	-
<i>Arius parkii</i>	-	X**	-	-	-	-	-
<i>Elops lacerta</i> (Elopidae)	-	X**	X**	X*	X*	X*	-
<i>Hemichromis</i> <i>fasciatus</i> (Cichlidae)	-	X*	-	-	-	-	-
<i>Mugil cephalus</i> (Mugilidae)	-	X*	-	-	-	-	-
<i>Chrysichthys</i> <i>walkeri</i>	-	X*	-	-	-	-	-
<i>Hemiramphus</i> <i>brasiliensis</i>	-	X*	-	-	-	-	-
<i>Pseudotolithus</i> <i>senegalensis</i>	-	X*	-	-	-	-	-

Relative Abundance: Very Abundant: **** To Low Abundance: *, Not Present: -

Albarete (1984 In: DeGeorges, 1985) with permission, CRODT & Albaret.



Source: Albaret (1984 In: DeGeorges, 1985) with permission, CRODT & Albaret.

Figure 7.12: The relationship between the number of fish species and salinity in the Casamance as measured from January to March 1984

Fish catches in the Department of Kaolack – Siné Saloum fell from a high of about 4,000 metric tons in 1975 to a low of about 1,000 metric tons/year in the early 1980s. It should be noted that the *Ethmalosa* yields dropped from a high of 829 tons in 1975 to a low of 40-70 tons in the early 1980s. *Mugil* species, likewise, while relatively speaking surviving the hypersaline conditions, dropped from a peak of 1,070 tons in 1975 to lows of 200-300 tons/year in the early 1980s (Table 7.11).

In the Casamance, *Ethmalosa fimbriata* predominates downstream and is caught in waters as saline as 82 ppt. (Table 7.12). *Sarotherodon melanotheron* tolerates slightly higher salinity and predominates in assemblages further upstream. *Tilapia guineensis* has the same distribution but is less abundant, except far upstream where it is able to multiply rapidly (Binet, *et al.*, 1994). On the other hand, the *Ethmalosa* is capable of large-scale anadromous migration: in the Gambia, it goes as far as 200 km upstream when salt water flows in (Scheffers & Conand, 1976 In: Binet, *et al.*, 1994). Binet, *et al.* (1994) consider the *Ethmalosa* an

opportunistic fish capable of physiologically adapting to everything from hypersaline waters to estuarine/fresh water, with a wide-ranging and flexible behavior. This case study would seem to support this conclusion. Still, under hypersaline conditions yields of this species fall off!

The same three genera/families also became dominant in catches (Table 7.12) from the Department of Sedhiou, Casamance in the 1980s, going upstream from the mouth of the Casamance Estuary/River to Sedhiou (km 168) that in 1984 experienced hypersaline conditions of 82-83 ppt. (Albaret, 1984 *In: DeGeorges, 1987d*). As importantly, during this period, fish catches from this department declined from a high of 10,000 metric tons per year in the early 1970s (just before or at the beginning of the drought) to a low of 2-3,000 tons/year during the drought (DeGeorges, 1985 *In: DeGeorges, 1987d*). Likewise, the size of the fish greatly decreased in size in the Casamance during this same period where hypersalinity was a problem (Albaret, 1984 *In: DeGeorges, 1985*), very likely due to physiological stress affecting growth, fecundity and the inability of adult fish to withstand hypersaline conditions because of their decreased ability to adjust to osmotic stress compared to juveniles. This is an area requiring further study.

In the Casamance, Albaret (1984 *In: DeGeorges 1985*) also found a number of species to be reproductively “ripe” with eggs at relatively high salinities:

1. *Ethmalosa fimbriata*, ripe until 78 ppt.
2. *Gerres nigri* ripe until 66 ppt.
3. *Sarotherodon melanotheron* ripe at greater than 80 ppt.
4. *Liza grandisquamis* ripe until 54 ppt.
5. *Liza falcipinnis* one male out of a dozen found in sexually advanced state at 76 ppt., rest sexually arrested or beginning of maturation period

6. *Mugil cephalus* and *Mugil bananensis* at 76 ppt. sexually arrested or beginning of maturation period

There was no evidence of the relative success of larval or juvenile fish to survive under these hypersaline conditions (Albaret, 1984 *In: DeGeorges, 1985*), nor was there an indication of the effects of hypersaline conditions on fecundity (number of eggs produced by the estuarine fishes). The decreasing size of fish in the Casamance Estuary and the dominance of juvenile fish in the hypersaline waters of the Bas Delta, Mauritania (DeGeorges, 1984) implies that adult fish may not be able to physiologically tolerate such conditions. It would appear that adults of a number of species may be breeding in lower saline environments, while hypersaline zones are visited by the more physiologically adaptable juvenile fish for undetermined periods of time. Although not as clear, sampling of hypersaline ponds in the Aftout Es Sahel appeared to have resulted in a dominance of juvenile fish that may have their origin in waters of lower salinities (GFCC 1980a). Given the limited sampling times for these studies, this issue needed further study and research. If increasingly hypersaline waters results in a predominance of juvenile fish in the estuary, this could have grave economical implications for estuarine fisheries, since small fish tend to sell for a lower price per kilogram than large fish.

Preliminary indications in the Casamance were that a critical fall off of species occurred at hypersaline conditions between 56-66 ppt. (Table 7.12 and Figure 7.12). It is hypothesized that a critical fall off in biomass could be attained well before these salinities have been reached; once again, this would need to be studied.

According to Binet, *et al.* (1994), fish catches in the Casamance actually increased from 1965–1983 with the rise in salinity prior to collapsing in 1984. A

similar trend over time with increasing hypersaline conditions appears to be the case in the catch records shown for the Sine Saloum given in the Table 7.11, though exact salinities are not known.

An additional statistic that needed to be considered was provided by Dr. LeReste (*pers. comm. In: DeGeorges, 1985*)¹⁶⁶ of the *Centre de Recherche Océanographique Dakar/Tiaroye, Senegal* (CRODT)/*Institut Senegalais de Recherches Agricoles* (ISRA), which he obtained from the *Direction de Pêche et Océanographie Maritime* (DPOM). Since 1977, if not before, there was a gradual decline in the catch record of sole from the Casamance, primarily from the family Cynoglossidae (Table 7.13):

Between 1982 and 1985, sole had practically dropped out of the catch record near the ocean. Dr. LeReste attributed this to the increasing year-round hypersaline conditions (LeReste, *pers. comm. In: DeGeorges, 1985*). The Cynoglossidae have life cycles linked to estuarine conditions (see Table 7.9).

Table 7.13: Annual yield/catch records of sole from the Casamance

Yield In Metric Tons	Date
277	1977
172	1978
148	1979
136	1980
93	1981
82	1982

Source: DPOM, through Dr. LeReste of CRODT/ISRA (*In: DeGeorges 1985*) with permission, CRODT.

¹⁶⁶ Dr. Louis LeReste, *Centre de Recherche Oceanographique de Dakar-Thiaroye*, CRODT, Senegal

The risk to the estuarine fishery in the Gambia thus becomes obvious from these case studies: major declines in fish by species, abundance and likely yields.

Mangrove Dieback, Hypersalinity, Flow and the Shrimp Fishery

Pink shrimp, *Panaeus notialis*, spawn at sea. Post larvae are carried by the tidal currents to their estuarine nursery grounds. Dr. LeReste collected all known information from Senegal on the life history of this species (LeReste, *pers. comm.* In: DeGeorges, 1985). He found that in the estuary, shrimp preferred a range in salinity of between 25-55 ppt. and quiet waters of 30-36 cm/sec. Higher or lower saline conditions resulted in a rapid fall off in the size of shrimp. Stronger currents tended to push the shrimp from the estuary to the ocean. Weaker currents imply decreased freshwater flushing, which establishes conditions favorable for the development of hypersaline conditions and, in the extreme, decreased shrimp production.

According to LeReste, 1987 In: Binet, *et al.* (1994), “capture weight¹⁶⁷ is related to stock biomass and hence to the size of the migrating shrimp. Final shrimp growth size, however, depends on salinity and current speed, in accordance with the square of the salinity and in inverse ratio to the speed of the current”.

According to this model, size at migration peaks at a salinity of 29 ppt., (close to the osmotic sub-adult point of equilibrium), but shrimp size falls off strikingly at salinities below 10 ppt. or above 50 ppt. Within these boundaries, size depends primarily on current speed, which, in the Casamance, drops progressively upstream (Binet, *et al.*, 1994).

¹⁶⁷ Yield in tons

"Capture weight also depends on the numbers of shrimp caught and this, rather than spawning intensity, probably depends on the surface area of the zones favorable to post-larval ($5 < \text{Salinity} < 50$ ppt.) and sub-adult ($20 < \text{Salinity} < 50$ ppt.) growth" (Binet, *et al.*, 1994)

In the Casamance, which has been studied extensively by LeReste, the following was found (Figure 7.3):

- In the lower Casamance Estuary around Pt. St. Georges, while salinities are ideal, currents were too strong and shrimp never achieved very large size prior to migrating to sea.
- At Ziguinchor, salinities were ideal, currents reduced and shrimp achieved relatively large harvestable size both in the fall and in the spring.
- Further upriver, the size of the shrimp depended on rainfall:
 - In the fall, salinities may be ideal and currents low so as to permit an excellent harvest in October-November while later exhibiting excessive salinities that eliminate a good spring harvest (March-April).
 - High rainfall and strong currents may result in poor environmental conditions for a fall harvest, with appropriate salinities and currents being achieved in time for an excellent spring harvest.
 - Under ideal rainfall events, salinities and currents may be such as to permit both good fall and spring shrimp harvests.
 - Extremely low rainfall years may result in reduced currents and in excessively high year-round salinities resulting in a fall out of the shrimp fishery.

Hypersaline conditions and mangrove dieback also have had an effect on the shrimp fishery of the Casamance, shrimp using mangrove systems as nursery grounds. Between the beginning of the drought in the early 1970s and 1974, it was estimated that 25% of the mangroves in the Casamance Estuary died, this percentage increasing slightly each year thereafter until the preparation of the report in question (DeGeorges, 1985).

In 1984, the spring shrimp fishery collapsed, forcing the closure of fish processing plants in the Casamance (University of Michigan, 1985a; DeGeorges, 1987d). Thus, increased hypersalinity and predicted mangrove dieback from the Balingho Barrage on the Gambia River could adversely impact shrimp populations and yields.

Mangrove Oyster, Hypersalinity, Mangrove Dieoff and Emigration

In the Casamance, hypersaline conditions have also affected the mangrove oyster, so important to the artisanal fishery of the Gambia. According to Binet, *et al.* (1994),

“The harvest of mangrove oyster (*Crassostrea gasar*) is an ancient practice that is still very much alive in the Casamance (Cormier-Salem, 1987 In: Binet, *et al.*, 1994). There was a very active trade in dried oysters up to 1950. The harvest was particularly important during the drought years when it was impossible to grow rice. But the riverbank soil became increasingly permeated by acid sulphates and salts and the groundwater became very salty. Upriver from Ziguinchor, the mangroves are now nothing more than dead wood. There was a spectacular drop in the *Rhizophora mangle* zone in favor of a degraded mangrove or *Sesuvium* carpet. The ‘tannes’¹⁶⁸ have risen by 73% to the detriment of the waters and the mangrove. The habitat favorable to oysters has shrunk substantially. Last of all, spawning and growth are also adversely

¹⁶⁸Tannes are bare saline and acidic soils, normally just inland from mangroves where no plant life can grow.

affected by the salinity. The drought-related drop in agricultural activities is no longer offset by the oyster harvest, which was traditionally a women's job, and this has produced rural emigration. Only the resumption of a favorable rainfall pattern could reverse this trend”.

Likewise, “in the Casamance, all the freshwater fish still found in the Gambia estuary until recent times have disappeared” (Albarete, 1987 *In: Binet, et al.*, 1994).

The above factors must be taken into account in assessing the possible effects of dam development on the Gambia River Basin’s fishery resources. This is especially true for any activity, which could result in a major modification of the estuarine ecosystem, such as the Balingho Anti-Salinity Barrage, and modification of downstream hydrology by high dams.

The above changes which could impact on the mangroves and the fisheries of the Gambia would also result in secondary impacts such as the use of mangroves as a renewable resource for wood and energy supplies, the availability of fresh water in mangrove zones for swamp culture of rice, the availability of fish as economic and nutritional resources for the region, the availability of fish for piscivorous birds and mangrove leaf fall as a source of food for the manatee (Powell, 1984).

In closing this session, it must be understood that in undertaking an environmental assessment, one is not conducting primary research but in many cases drawing on the best available current data. This data must be synthesized, assessed for what it is worth, and then a risk or opportunity-cost analysis must be undertaken based on best available data. This will help show what alternative will allow politicians and decision-makers to best achieve their goals, while still minimizing the adverse impacts to a particular area of concern. The analysis in these sections was an attempt to undertake such an exercise.

7.8.7.4 Dam impacts Zambezi River Delta estuarine fishery

Almost half of the shrimp species caught are of the species *Penaeus indicus*, which have a life cycle of one year. Spawning takes place at sea, but the larvae and juveniles require brackish water as nursery areas and must migrate against the current to reach the protected mangrove swamps. Because shrimp are inefficient swimmers, low dry season flows enable them to migrate inshore on tidal currents. High flood season flows, in turn, lower the salinity in the mangrove swamps and trigger juveniles to move from the mangrove zone to the ocean to reproduce. Flood flows also spread nutrient-rich river water along the coastal bank to stimulate shrimp recruitment (Beilfuss & dos Santos, 2001).

“With the closing of Kariba Dam in 1959 and Cahora Bassa Dam in 1974, nearly 90% of the Zambezi catchment has become regulated and the natural flood cycles of the Lower Zambezi River are now a phenomenon of the past. Flooding events in the Lower Zambezi, when they occur, are now dependent upon local rainfall-runoff within the Lower Zambezi catchment or unplanned (possibly catastrophic) water releases from the upstream dams” (Beilfuss, *et al.*, 2002).

“The prawn fishery off the delta coast, which began in 1965, is one of the most important sources of foreign currency in Mozambique, employing many people near the coastal cities of Chinde and Quelimane. The catch rate of the shrimp has been decreasing at a rapid rate since the early 1980s, largely due to reduced Zambezi flooding and increased dry season flows” (Beilfuss, *et al.*, 2002.).

“Catches declined from 10,000–12,000 tons in 1974-76 to 8,000 tons in 1983 and 7,900 tons in 1998 and were comprised of 3 species making up the following percentages of catch; comprised of three species – *Penaeus indicus* (48%), *Metapenaeus monoceros* (42%) and *Penaeus monodon* (10%)” (UTIP, 2002).

In the Zambezi Delta, the adverse impact of modified seasonal flows on local shrimp fisheries has been estimated at minus -\$10 million (WCD, 2000) to minus 10-20 million/year (Hoguane, 1997 *In:* Beilfuss & dos Santos, 2001). It is predicted that catch rates would increase by 20% with increased flood flows (Gammelsrod, 1992 *In:* Beilfuss & dos Santos, 2001; UTIP, 2002) from December to March (UTIP, 2002) and decreased dry season flows (Gammelsrod, 1992 *In:* Beilfuss & dos Santos, 2001) or 1,500 tons/year valued at US\$ 9 million (Euros 10 million) (UTIP, 2002).

At the same time,

“Over the past three decades, riverine and near-shore coastal fisheries have replaced the floodplain fishery in the Delta. Fishermen use canoes and nets or lines. They concentrate in small fishing camps along the riverbanks, producing fresh, dried, or smoked fish. Only about 17% (one-sixth) of the households in the Marromeu area sell fish during most years. The catch-per-unit-effort in the main stem Zambezi is low due to high dry season flows, and most of the fishing camps are now found in the coastal waters of Chinde district” (Beilfuss, *et al.*, 2002).

Further upstream, some Cyprinid fish species have been observed unsuccessfully attempting to climb up a low dam wall on the Manyame River near the Seke-Doma Township when the reservoir spills. Adults of all four species of eels, *Anguilla bengalensis labiata*, *A. bicolor bicolor*, *A. marmorata* and *A. mossambica*, known to occur in Zimbabwe, migrate to the sea for breeding. The young eels, called elvers, migrate upstream into rivers where they spend the next 10 - 20 years before returning to the Indian Ocean for breeding. It appears that they are able to find a way through the Cahora Bassa Dam. It was argued that the Kariba Dam was an impenetrable barrier for eel migrations, but evidence suggested that eels were still able to move upstream across the dam wall, as eels younger than the dam were observed in Lake Kariba and further upstream. It is

not known whether the African mottled eel, *A. bengalensis labiata*, manages to overcome the Cahora Bassa Dam in its up- and downstream migrations (WCD, 1999).

7.8.7.5 Volt River, Akosombo Dam/Volta Reservoir, Ghana

Filling the Akosombo Reservoir behind the dam took several years, resulting in a heavily reduced seaward flow with infiltration and evaporation reducing the flow still further. In the Volta Estuary and adjacent lagoons, the quantity and quality of the freshwater changed considerably. Shrimp and oyster production ceased in the lagoons and a record low in shrimp production was recorded (Mensah, 1979 *In: Binet, et al.*, 1994).

7.8.7.6 Nile River, Aswan High Dam

Prior to the Aswan High Dam (pre-1970), nutrients carried into the Mediterranean during the flood season resulted in large plankton blooms. This supported a large sardine fishery accounting for 30-40% of the annual Egyptian marine fishery yield. With the Aswan High Dam, and the elimination of the annual flood, the sardine fishery fell from 18,000 tons to less than 1,000 tons. The catch has since risen to a few thousand tons attributed to improved catch technologies, not necessarily a return in production. The shrimp yields at the mouth of the Nile also decreased by 67% with the elimination of nutrient supplies. Landings of other fish were 77% below pre-dam levels (McCully, 2001). Kapetsky and Petr (1984) estimate a decline in the sardine fishery as a result of the Aswan High Dam, their proportion in catches falling from 37% to 9%. General fish landings in the Mediterranean fell from a high of 38,000 tons in 1962 to 7,000 tons in 1979 or 81% below pre-dam highs, but then appeared to recover to some degree.

7.8.7 Dam Impacts on Forests

Impacts on forests occur from those lost within the inundation zones of reservoirs and those lost downstream from modified flood regimes. Of significant consequence are impacts on mangrove ecosystems, which are linked to a detrital food chain necessary to sustain many rich fisheries in the tropics. They also serve as habitat for unique species such as manatee and dugong.

7.8.8.1 Senegal River

The Senegal River's Manantali Reservoir destroyed 120 km² (12,000 ha) of forest within the inundation zone (Bossard, 1999). The GFCC environmental assessment predicted more than three times this amount of forest being lost; about 7 km² (700 ha) of productive fringe forest would be lost along the Bafing River and 429 km² (42,900 ha) of less productive open forest would be permanently lost, both from inundation behind the Manantali Dam (GFCC, 1980d).

The downstream impact from reduced flooding by the Manantali was projected to result in a loss of 76 km² (7,600 ha) of the remaining 379 km² (37,900 ha) of occasionally flooded *gonakié* forests and 10 km² (1,000 ha) of yearly flooded *gonakié* forests (GFCC, 1980e). *Gonakié* forests are composed almost exclusively of *Acacia nilotica* and are commercially valuable with a production rate of 1.43 m³/ha/year (20 cubic feet/acre/year) serving as firewood, charcoal and food (e.g., seed pods and seedlings) for livestock and wildlife, among others (GFCC, 1980e). The forests have died from lack of water (on the higher grounds) or water logging (in the low lying areas). Many have also been destroyed as a measure to control nesting sites of granivorous bird pests. Finally, many have been cut and sold for charcoal production because they were standing on land that would possibly be converted into paddy fields. There is a major adverse impact on

pasture/forage quality from wind and rain erosion associated with reduced forest cover (Hamerlynck, *et al.*, 2000).

Following the closure of the Diama Dam, mass mortality of the remaining mangrove stands occurred, especially in the late 80s and early 90s when strong tides that used to ride up the river were deflected from the dam and flooded the low lying Ntiallakh basin. As these floods tend to occur at the end of the dry season, water downstream of the dam was strongly hypersaline and vast areas were covered with a thick salt crust after the waters retreated. The impact on *Sporobolus robustus* stands, a perennial grass used in mat weaving, which, incidentally was the main source of income of the local women, was also devastating (Hamerlynck, *et al.*, 2000).

7.8.8.2 Gambia River

Closely tied to aquatic production and dominating the ecology of Gambia's Estuary are its mangrove swamps. There are an estimated 623.6 km² (62,360 ha) of mangroves comprising six species. Where floodplains tended to dominate in the Senegal River Basin's aquatic and terrestrial production, the extensive mangrove systems dominate aquatic production in the Gambia River Basin. Mangroves can be found from the mouth until 215 km upriver near Jarreng (Samba & DeGeorges, 1987b). This system is dominated by two species, *Rhizophora racemosa* and *Avicennia africana* (Snedaker, 1984; Twilley, 1985; Huygen, 1978 both *In:* DeGeorges, 1987d):

- *Rhizophora racemosa* is considered a pioneer species, colonizing recently deposited alluvial soils. *Rhizophora racemosa* stands greater than 20 meters high are found on the North Bank, just below Balingho at 119 km (mile 74) to a little above Dankunku Island at 167 km (mile 104). Stands

decrease up- and downstream from these two points due to the *Rhizophora*'s decreasing ability to stand increasingly more saline waters and its inability to out-compete other plants in increasingly fresh waters. It is the *Rhizophora racemosa*, which accumulates the pyrites that result in the production of potentially acid sulphate soils. *Rhizophora* forests are among the most productive woodlands in the Gambia River Basin with a growth potential of 70-210 m³/ha/year as a harvestable renewable resource.

- *Avicennia africana* is normally found behind the *Rhizophora* going inland perpendicular from the shoreline on higher elevation, higher saline soils. *Avicennia* is more salt tolerant than *Rhizophora*, being able to excrete salt from its leaves. Progressing further inland, soils become even more saline and more acidic where no plant can grow, this area being called *TannVif*. As the soil evolves going even further inland, it increases in pH and decreases in salinity to the point where tolerant plants such as *Sesuvium portulacastrum* invade bare tann soils. Eventually, the soils become more sufficiently evolved to permit rice culture. *Avicennia* are among the least productive forests in the Gambia River Basin with a growth potential of 5-10 m³/ha/year as a harvestable renewable resource. This evolution of soils and vegetation can be considered typical of mangroves in West Africa.

Other less important species include *Rhizophora harrisoni*, *R. mangle*, *Laguncularia racemosa* and *Avicennia nitida*. Mangrove ecosystems play a multifaceted role in the natural and human-made environments of the Gambia River Basin, but are adversely impacted by regional and local watershed degradation linked to humans and their livestock (Figure 7.13).

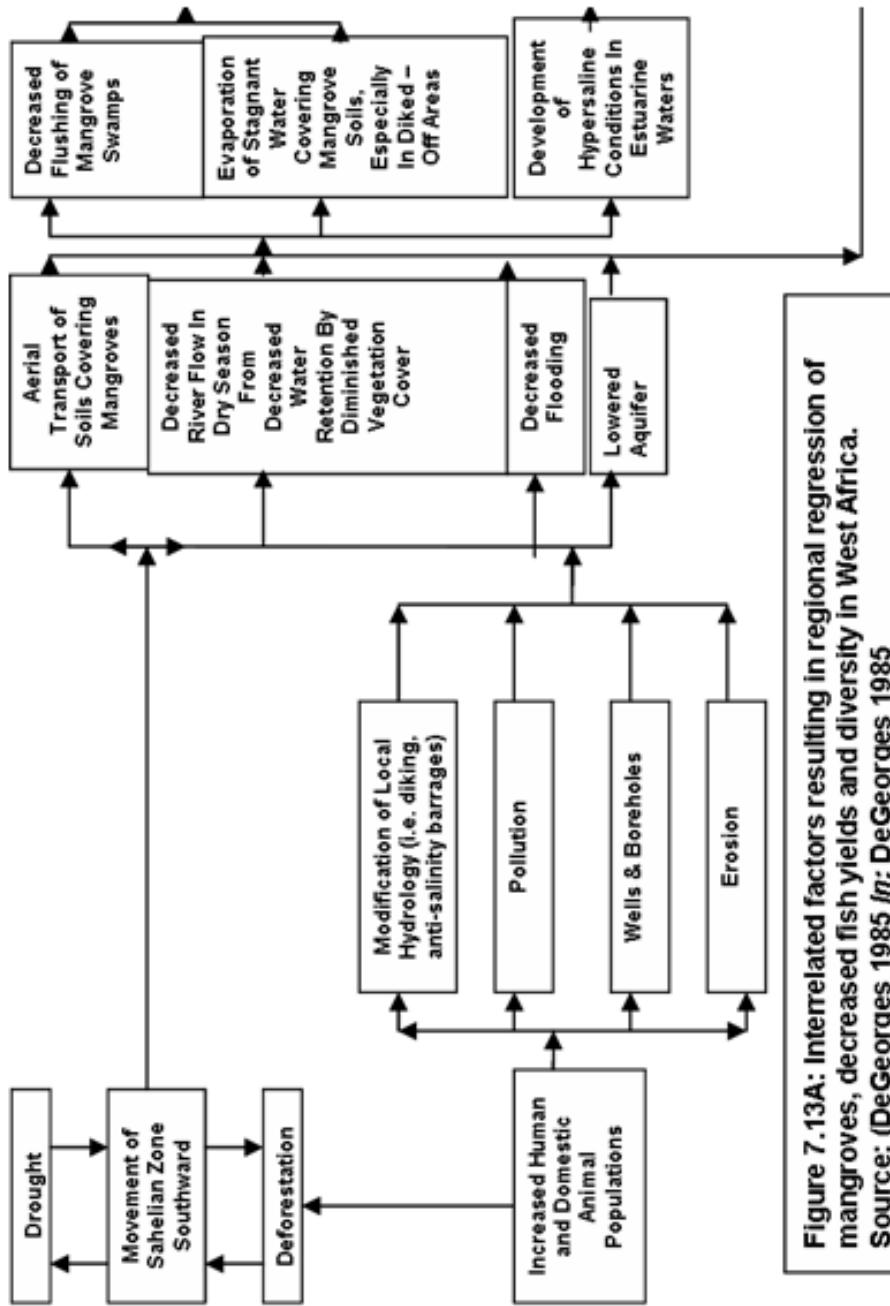
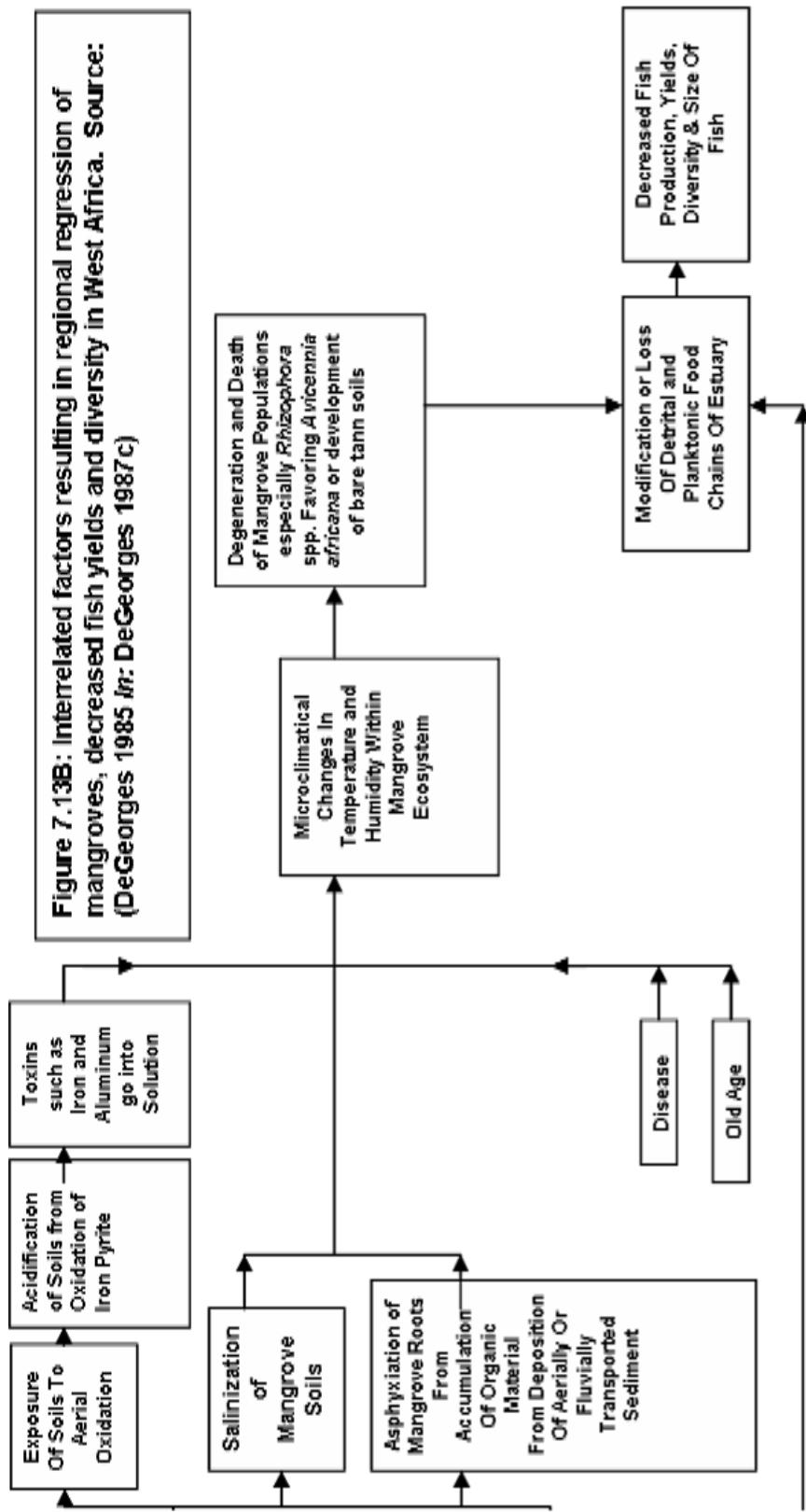


Figure 7.13A: Interrelated factors resulting in regional regression of mangroves, decreased fish yields and diversity in West Africa.
Source: (DeGeorges 1985 *In: DeGeorges 1985*)



Aquatic production in the Gambia River Estuary depends heavily on the detrital chain set up by leaf and litter fall originating from the mangrove ecosystem. This has been substantiated by in-situ measurements of primary productivity, which, although limited, indicate that the entire river system with the exception of the Lower Estuary tends to be heterotrophic, that is primary production in the food chain is driven by detrital material as opposed to autotrophic production by phytoplankton (DeGeorges, 1987d).

The main impacts on forests were projected to be on mangroves lying up- and downstream of the Balingho Anti-Salinity Barrage. These losses could not be mitigated. The extensive mangrove forests risked being degraded as a renewable resource. A standing crop of about 872,300 m³ of potential timber totaling 79 km² (7,911 ha) of mangroves would be permanently lost from inundation and the creation of a freshwater reservoir (Rodriguez 1985 *In:* Samba & DeGeorges, 1987a; 1987b). This is estimated to be 12% of the total mangrove forest in the basin (University of Michigan, 1985a). It was projected that there would also be a major dieback and inland shift of mangroves over an estimated minimum of 30 to a maximum of 130 kilometers downstream of the dam.

The most productive forests in the basin, *Rhizophora*, would be replaced by the more salt tolerant *Avicennia*, among the least productive forests in the basin (Snedaker, 1984; Huygen, 1978 both *In:* Samba & DeGeorges, 1987a; 1987b). The loss and/or species shift in mangroves, declining detrital food chain and deteriorated habitat as a result of the Balingho Barrage would adversely impact the estuarine and marine fish production of the 31 species of fish noted above (Section 7.8.7.2, Gambia River).

The loss of mangrove habitat would greatly accelerate bank erosion (Snedaker, 1984 *In:* Samba & DeGeorges, 1987a; 1987b) and accelerate the process of

sedimentation in the Balingho Reservoir as well as the Port of Banjul. This could cost millions of dollars a year in dredging to maintain the reservoir and the port. Tidal amplitude was projected to increase between 10 and 20% below the barrage because of reflection of tidal waves off the barrage face (Harza, 1985 *In:* University of Michigan, 1985b).

7.8.8.3 Kiambere Dam, Kenya, Tana River

The Bura irrigation scheme was designed for 35,000 settlers on 14,170 ha (35,000 acres) growing cotton and staple corps in the Somali border district. After seven years, 2,632 ha (6,500 acres) were planted and only 2,000 families had moved in while capital costs escalated from US\$ 98.4 million in 1977 to US\$ 110 million (Rosenblum & Williamson, 1987).

While Bura irrigation managers knew that settlers would need fuel to meet their cooking needs, the project did not address the question. No woodlots were planted early on to provide fuel wood. Settlers had no choice but to plunder the riverine forest, the only green strip of land in this arid region. The forests and wildlife protection component of the Bura irrigation project never got off the ground and deforestation ensued. Both the dam and irrigation scheme were funded by the World Bank (Horta, 1994).

7.8.8.4 Masinga Dam, Tana River, Kenya

Key water catchment ecosystems - among them Keiyo-Turkwell, Mt Elgon Forest and the Kinale-Aberdare-Mt Kenya forest belt - are under assault from loggers and speculators. The Kenya Wildlife Service (KWS) warns that the country risks losing all its forest cover in the first half of this century. The Kenya Forest Working Group, a group of government and non-governmental bodies interested

in forest issues, says that any country with less than a 10% (tenth) of its land under forest is environmentally unstable. By 1988, “the siltation rate has more than tripled to 10 million tons a year, while the reservoir storage capacity has gone down by 6%”, in the words of Dr Hirji Rafik, a senior research specialist, World Bank (Opala, 2001). The design sediment load into the reservoir was estimated as 3 million m³/yr, while later estimates show an increase to 11 million m³/yr, nearly four times the design capacity of the reservoir. Increase in soil erosion on farmlands, access tracks and roads, coupled with clearing of forests without concomitant soil erosion control measures point to the causes of an increased rate of sedimentation (Bobotti, 2000).

7.8.9 Dam Impacts on Livestock and Wildlife.

The most significant impact on livestock and wildlife from dam construction in Africa tends to be the loss of critical dry season grazing land along floodplains. In certain cases, where a high dam inundates major wildlife habitat, this has forced the displacement of game, placing additional pressures on the remaining habitat and often causing conflict with humans.

7.8.9.1 Senegal River

Very little of Sub-Saharan Africa’s revered mega-fauna is left along the Senegal River Valley, while remnant populations exist in the headwaters of Mali. However, the world renowned Djoudj National Bird Sanctuary, a UNESCO (United Nations Educational, Scientific And Cultural Organization) World Heritage Site, is a major wintering ground for an estimated 3 million birds coming from Europe and Asia and along with resident birds comprises about 300 identified species (UNEP-WCMC, 2002). Certainly, the major loss of floodplains

has had a long-term adverse impact on migratory birds, though no quantitative data is presented.

Le Houerou and Hoste (1977 *In: GFCC*, 1980f) found that in the Sahel, the area required to support one tropical livestock unit (TLU) of 250 kg (consuming 6.25 kg dry matter/day or 1,400 forage units and 95 kg total digestable protein/year; cattle, camel, horse and donkey = 0.85 TLU and sheep/goats = 0.14 TLU) (GFCC, 1980f) was:

- 12.72 ha in areas with <250 mm rainfall.
- 6.35 ha with 251-500 mm rainfall.
- 3.17 ha with 501-1,000 mm rainfall

At the time of the GFCC (1980f) study, the load was 8.96 ha/TLU in Senegal, with no figures for Mali or Mauritania.

Along the Senegal River and throughout the Sahel, nomadic pastoralists and their livestock disperse from the floodplains during the rainy season and return during the dry season. During the rainy season (June/July through about October), the herds move north on the Mauritanian side and south into the interior on the Senegalese side of the river to exploit the highly nutritious pastures and to avoid the disease vectors in the flooded valleys. The timing of their return to the floodplains depends on the intensity and extent of the year's rainfall and therefore of the available pasture outside of the wetlands. In bad rainfall years, the floodplains are virtually the only refuge, allowing the animals to survive until the next rains (Hamerlynck, *et al.*, 2000).

Reduced flooding and dikes for irrigation have reduced traditional grazing lands from 80,000 ha to 4,000 ha in the valley (GEF, 2002). Using the above estimate of 8.96 ha/TLU, this means that there would be a reduction from 8,928 TLUs to

446 TLU on the floodplains at a minimum. The impact is likely greater if, in fact, with the Manantali, the average annual flood of 459,000-549,000 ha (GFCC, 1980b; 1980d) lasting 5 months (GFCC, 1980h) had been reduced to about 340,000 ha (see Table 7.5) amounting to a decline in grazing land of between 119,000 and 209,000 ha, or 190,000 ha flood under full development amounting to a decline in grazing land of between 269,000 – 359,000 ha (see Table 7.5). The reality is that today the annual average flood of about 77,000 – 104,000 ha (average about 82,600 ha) for about 2 months (see Section 7.10.7.1, Senegal River) results in a decline in grazing land of from 355,000 - 472,000 ha or more depending how much of the flood recession agricultural residue is made available to livestock after the harvest. The carrying capacity of these floodplains is likely much higher than the average ha/TLU given above so that the impacts would be much more dramatic as likely 100s of 1000s of livestock concentrate along the river during the dry season to take advantage of this extremely productive environment. If an estimated 300,000 head of cattle concentrate on the Gambia River Floodplains (Carney, 1984 *In:* Samba & DeGeorges, 1987a; 1987b) that total 158,000 ha (DeGeorges, 1987d) and that are orders of magnitude smaller than those of the Senegal River then two to three times this number might use the Senegal River Floodplains during the dry season. In the Senegal portion of the Senegal River Basin alone, GFCC (1980f) estimate livestock loading in the pre-dam period to range between 566,000 to 742,000 TLUs ranging over 6,649,500 ha, which was believed to be conservative. By converting all livestock to TLUs, GFCC (1980d) estimated about 2,066,000 TLUs for the entire basin. A large portion of this livestock would likely end up along the floodplains of the Senegal River during the dry season, while some might migrate southwards feeding on crop residue in farming areas.

Many riparian species depend on shallow floodplain aquifers that are recharged during regular flood events (WCD, 2000). In the *Bas* Delta of Mauritania,

traditional pasture included the grasses such as *Sporobolus robustus*, as well as pasturage in inundation zones consisting of *Echinochloa colona*, *Oryza barthii*, and *Dactyloctenium aegyptium*. *Acacia nilotica* was present in low-lying areas and inter-dune depressions. *Acacia tortilis* was found on interior dunes. Decreased flooding from the Manantali Dam as well as the droughts of the 1980s resulted in a rising saltwater groundwater table, and subsequent soil salinization. This has resulted in severely degraded pasturage throughout the Delta and the Senegal Valley. A dike on the right bank, Mauritanian side of the Lower Delta had a similar impact. Salt tolerant species of lower nutritional quality replaced these grasses and trees. The *Avicennia germinans* mangroves and plains *Sporobolus robustus* just about disappeared (GREZOH, 2000).

Gambia River

Wildlife, protected by international and national conservation, and its habitat would be threatened by the proposed Balingho Barrage. Species potentially affected by the loss of habitat, especially mangroves include:

<u>Species</u>	<u>IUCN/ESA STATUS¹⁶⁹</u>	<u>CITES¹⁷⁰</u>
West African Manatee (<i>Trichechus senegalensis</i>)	Vulnerable/Threatened	Appendix II
Sitatunga (<i>Tragelaphus spekii gratus</i>)	Low Risk/-	-
African Dwarf Crocodile (<i>Osteolaemus tetraspis</i>)	Vulnerable/Endangered	Appendix I
Nile Crocodile (<i>Crocodylus niloticus</i>)	-/Endangered	Appendix I ¹⁷¹
African Slender-Snouted Crocodile (<i>Crocodylus cataphractus</i>)	Data Deficient (DD)/Endangered	Appendix I
Sousa Dolphin (<i>Sousa teuszii</i>)	Data Deficient (DD)/-	Appendix I

¹⁶⁹ IUCN (International Union For the Conservation of Nature) from IUCN (2004); ESA (1999). See Chapter 10, Figure 10.7: IUCN species threat categorization and U.S. Endangered Species Act (ESA) (ESA, 1999) and see Chapter 10, Section 10.7, ENDANGERED SPECIES ACT OF THE USA, IMPEDIMENT TO AFRICAN CONSERVATION.

¹⁷⁰ CITES (2005); UNEP-WCMC (2005), see Chapter 10, Section 10.3, CITES for definition of Appendix I, II, III.

¹⁷¹ Except Botswana, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Namibia, South Africa, Uganda, Tanzania (subject to export quota of no more than 1,600 wild specimens including ranched specimens), Zimbabwe and Zambia in Appendix II (CITES, 2005; UNEP-WCMC, 2005).

The major impact of the dam options on the natural environment in the Upper River comes from adverse (-), long-term irreversible effects of the Kekreti Reservoir on the Niokolo Koba Park and surrounding habitat. It was projected that 77 km² (7,700 ha) of the Niokolo Koba Park would be inundated. This is less than 0.1% of the park (University of Michigan, 1985a). However, the Niokolo Koba Park represents a major source of tourism revenue for the region and is the major refuge for some of the last populations of large mammals remaining in West Africa. The park is classified as an IUCN “Man and the Biosphere Reserve” and as a UNESCO “World Heritage Area”. Among other species, it contains:

<u>Species</u>	<u>IUCN/ESA Status</u>	<u>CITES</u>
Chimpanzee (<i>Pan troglodytes</i>)	Endangered/Endangered	Appendix I
Wild Hunting Dog (<i>Lycaon pictus</i>)	Endangered/Endangered	-
Lion (<i>Panthera leo</i>)	Vulnerable/-	Appendix II
Leopard, (<i>Panthera pardus</i>)	-/Endangered ¹⁷²	Appendix 1
Elephant (<i>Loxodonta africana</i>)	Vulnerable/Threatened	Appendix I ¹⁷³
Western Race, Lord Derby		
Eland (<i>Taurotragus derbianus derbianus</i>)	Endangered/-	-
African Dwarf Crocodile (<i>Osteolaemus tetraspis</i>)	Vulnerable/Endangered	Appendix I
Nile Crocodile (<i>Crocodylus niloticus</i>)	-/Threatened	Appendix I
African Slender Snouted Crocodile (<i>Crocodylus cataphractus</i>)	Data Deficient (DD)/Endangered	Appendix I

At the time (early 1980s), there were only about 25-50 elephant remaining in Niokolo Koba. In 2004, the numbers were so low that translocating elephant from Burkina Faso has been considered. Likewise, this pocket of the Western race of the Lord Derby eland is in dire need of protection. The Niokolo Koba Park, with its extension into Guinea-Conakry (Parc de Badiar) and the adjacent Falémé River Basin, serves as important habitat for large antelope including the Lord Derby eland (*Taurotragus derbianus derbianus*), western roan (*antelope cheval* or *koba* - *Hippotragus equinus koba*), sing-sing waterbuck (*kob defassa* -

¹⁷² “Endangered” in Africa except “Threatened” south of and including, the following countries: Gabon, Congo, Zaire, Uganda, Kenya (ESA, 1999).

¹⁷³ Botswana, South Africa, Namibia and Zimbabwe, Appendix II, rest Appendix I (CITES, 2005; UNEP-WCMC, 2005)

Kobus defassa unctuosus/Kobus defassa defassa/Kobus ellipsiprymnus unctuosus), western hartebeest (*bubale* - *Alcelaphus buselaphus major*), cob du buffon (*Kobus kob kob*) and Harnessed bushbuck (*guib harnaché* - *Tragelaphus scriptus scriptus*), as well as the West African savanna buffalo (*Syncerus caffer planiceros*), hippopotamus (*Hippopotamus amphibius*), lion (*Panthera leo*), red river hog (*Potomochoerus porcus*), wild dog (*Lycaon pictus*) and honey badger (*ratel* - *Mellivora capensis*).

Outside of the Niokolo Koba/Badiar/Falémé complex, wildlife is on the verge of extinction in this part of West Africa, due to the historical past of mono-culture economies “peanuts” supplying cooking oil to colonial mother countries (e.g., France and Britain). This destroyed much of the wildlife and its habitat. Continued encroachment by human settlement and associated charcoal production, unregulated hunting, over-grazing and unsustainable itinerant slash and burn agricultural associated with reduced fallow are resulting in soil mining and massive habitat losses. Sadly to say, due to over-population and antiquated laws disenfranchising rural people from their wildlife and forests, sleeping sickness and the tsetse fly, are “the finger in the dike, holding back the flood” and even this is precarious since the N’Dama cow is trypano-tolerant (tolerant to sleeping sickness carried by the tsetse fly) (Van den Ende, 1984), allowing human habitation to encroach within this last refuge for wildlife in West Africa. Construction of a hard top road from Tambacounda through Niokola Koba via Kedougou and then through the *Zone d'intérêt Cynégétique de la Falémé* (hunting block) in the late 1980s/early 1990s would also certainly have encouraged human/livestock encroachment and poaching. Concern was also raised that in-migration of people and livestock to the reservoir zone to take advantage of fishing and other economic opportunities would risk increased human/wildlife conflicts from predation, poaching and from disease. It is believed that Niokolo Koba’s status as a national park and as a tourist destination would be seriously

compromised by the construction of the Kekreti Dam and Reservoir. With or without a dam, at the onset of the 21st century the only hope for this last refuge for Africa's mega-fauna in West Africa is community empowerment over these resources along the lines of "*gestion des terroirs*" principles which are discussed in Chapter 9 on Community-Based Natural Resource Management (CBNRM) (see Chapter 9, Section 9.8.9, *Gestion des Terroirs*, West Africa).

Further downstream in The Gambia, regardless of whether a piece of floodplain is rainfed or riverfed, irrigated or kept in tidal swamp, it would be necessary to integrate the estimated 300,000 head of cattle that use the floodplains as dry season forage areas into the management of planned agricultural development (Carney, 1984 *In:* Samba & DeGeorges, 1987a; 1987b). This would be necessary both above and below Kuntaur. Any scenario with the Balingho Barrage would result in 40,550 ha of dry season grazing area being permanently lost on the North Bank, Lower River and McCarthy Island divisions as a result of inundation by the Balingho Barrage's reservoir (Carney, 1984 *In:* Samba & DeGeorges, 1987b) out of a total floodplain estimate of 158,000 ha (DeGeorges, 1987d).

7.8.9.3 Zambezi River

Kariba Dam, Reservoir Area

Three major game reserves were created to absorb wildlife displaced by the Kariba Lake (Thomson, *pers. comm.*):

- The Matusadona Game Reserve (now national park) makes up about 25% of the Kariba shoreline;
- The Chete Game Reserve and Sijarira Forest take up 50% of the Binga District of the Kariba shoreline; and
- The Chizazira Game Reserve.

The Chete and Chizazira shorelines are rocky and deep, unsuitable for both fishing and agriculture and not even that good for wildlife. Neither Chete nor Chizazira have much tourist value. Matusadona had good land and could be considered for settlement, but comprised only about 12% of the entire southern Kariba shoreline. It has become a tourist destination, albeit a small one (Thomson, *pers. comm.*).

The actual “Operation Noah” was more of a publicity stunt than an effective conservation undertaking to “save wildlife” that might be lost from inundation by the Kariba Reservoir (Thomson, *pers. comm.*). Over a five-year period, about 6,000 animals were rescued (Nhamo, 1999; Tumbare, 2000). According to Ron Thomson (*pers. comm.*; Thomson, 1997), of this only about 2,000 could be considered game, and this mostly consisted of impala. There were 20-30 black rhino caught of which nine black rhino were sent to the Hwange National Park and the remainder released on the mainland and a few sable recovered, but the majority were medium to small animals like kudu, bushbuck, impala, waterbuck,

monitor lizards, baboon and monkeys, mongoose, etc. This was mainly wildlife trapped on “islands” created by the rising waters of the reservoir. Most of the recovered wildlife was released into the newly settled Ba-Tonga areas, and/or released along the riverbanks and wandered into their resettlement areas only to be poached!

The majority of wildlife moved off into the interior on its own, becoming “super-saturated” as it competed for food, territory and space with wildlife already existing in the areas of refuge (Thomson, *pers. comm.*; Thomson, 1997; 2003).

Kariba Dam, Downstream, Zambezi River

The flood magnitude of the Zambezi River was reduced by 24% due to the Kariba Dam, resulting in the reduction of flooding of the Mana Pools Floodplain (WCD, 1999; Tumbare, 2000). Riverine vegetation was replaced by more dry land vegetation in those areas normally kept wet by discharge overspill during flooding (WCD, 1999). Normally the rains in Zimbabwe arrive in November-December within the immediate Kariba Watershed in Zimbabwe and Zambia. The flood peaks in April with waters originating out of the Angolan Highlands, the Victoria Falls being at their peak at this time (Beilfuss & dos Santos, 2001; Thomson, *pers comm.*). Throughout eons of time, the downstream wildlife developed its life cycle, as did the people, around this cyclical flooding. Most wildlife along the river reproduced at the low point in the Zambezi water regime in September and October and/or was somehow dependent on traditional low flow regimes for survival, for example:

- Wildlife that lays eggs in riverbanks such as crocodile, monitor lizards, bee-eaters, plovers and king fishers (Thomson, *pers. comm.*);

- Wildlife that nests on sand banks such as the African skimmer (*Rhynchos flavirostris*) (Thomson, *pers. comm.*); and
- Wildlife that nests in reed beds such as weaver birds (Thomson, *pers. comm.*).

Also,

- The breeding cycles of many species of water birds, including threatened species such as Pel's fishing owl (*Scotopelia peli*), the eastern white pelican (*Pelecanus onocrotalus*), wattled crane (*Bugeranus carunculatus*), black stork (*Ciconia nigra*), and African skimmer (*Rhynchos flavirostris*) are triggered by the annual inundation and draw down of floodwaters (Beilfuss & dos Santos, 2001).
- Several species of wading birds, including the openbilled storks (*Anastomus lamelligerus*), depend on the annual minimum flows for freshwater snails and mussels on the exposed shifting sandbars of the Lower Zambezi during the dry season (Beilfuss & Bento, 1997 *In:* Beilfuss & dos Santos, 2001). Any further stabilization of the Zambezi flow regime will greatly diminish the availability of sandbar habitats, threatening one of the largest populations of openbilled storks reported in Africa (Beilfuss & dos Santos, 2001).

With the coming of the rains in November and December, the Kariba Reservoir fills rapidly. The sluice gates were not designed to be able to discharge this quantity of water in so short a time. In anticipation of this sudden rise in water level and in order to avoid breaching and possibly breaking the dam face, waters are released early in September and October (Thomson, *pers. comm.*). According to Beilfuss and dos Santos (2001),

“the magnitude of monthly flows is sharply reduced during the peak-flooding season, including a 41% reduction in the mean monthly flow in April and 36% reduction in March...translating to a dramatic decrease in the inundated area of floodplains below Kariba Gorge, including the Mana Pools National Park”, while “average dry season flows have more than tripled, from 255 m³/s to 812 m³/s in October, changing the dry season character of the Zambezi River from a meandering sandbank river to a single down-cut channel”.

Both Thomson (*pers. comm.*) and Beilfuss and dos Santos (2001) agree that these modified, and one can say irregular and inappropriate, flows during the dry season have an adverse impact on the reproductive cycles and/or food supplies and thus the population status of the above species along the main channel of the Zambezi. Since this wildlife had been evolutionally programmed, each year this wildlife sets about breeding and each year humans wipe out nesting sites, eggs and food supplies with these artificially high flows. These species are replaced to some degree with wildlife breeding along feeder-rivers and streams that are not impacted by these floods (Thomson, *pers. comm.*).

Cahora Bassa Reservoir Area

The reservoir area supported a rich diversity and density of animals, including eland, bush pigs, buffalos, elephant, and rhinoceros. Large herds of animals were swept away as the lake rose and others starved on small islets in the middle of the newly formed lake. Some migrated out of the region, and others retreated to the reservoir shoreline and surrounding escarpment. In recent years, many of the remaining mammals have disappeared from the Cahora Bassa lakeshore due to over-hunting, although significant numbers remain in the Magoe and Cahora Bassa Districts on the southwestern shore of the reservoir (Beilfuss, 2001).

Wildlife and Livestock Impacts in the Zambezi Delta from the Cahora Bassa Dam and the Kariba Dam

Recent research in the Zambezi Delta suggests that wattled cranes (*Bugeranus carunculatus*) have abandoned most of the floodplain, due to erratic flooding patterns, in favor of floodplains adjacent to the Cheringoma Escarpment, which still receives unregulated floodwaters (Beilfuss & dos Santos, 2001). With similar impacts from irregular wet and dry season flows from dam releases, the causes for this movement are discussed in the following case study of the Kafue Flats, Zambia, also the home of the wattled crane (Beilfuss & dos Santos, 2001; Kamwenesche & Beilfuss, 2002).

The 6,880 km² (688,000 ha) Marromeu Complex consists of the Buffalo Reserve established in the 1950s and four surrounding hunting blocks established in the 1960s (*coutadas* 10, 11, 12, 14) on the south bank, made up of floodplain grasslands, deepwater swamps and mangrove forests (Beilfuss & dos Santos, 2001). The Marromeu Swamps contained one of the highest populations of buffalo in Africa. Prior to the construction of the Kariba Dam, peak floods spread over a mosaic of vegetation communities in the 12,000 km² (1,200,000 ha) Zambezi Delta, one of the largest wetland systems in Southern Africa. Floodplain grasslands were inundated with floodwaters for up to nine months of the year and many areas were saturated throughout the dry season (Beilfuss, Moore, Bento & Dutton, 2001).

The Kariba, Kafue and then Cahora Bassa Dams have fundamentally altered the very large floodplain in the Zambezi Delta. With the great reduction in flooding, dry season forage was lost for both livestock and wildlife.

With the closing of the Kariba Dam in 1959 and the Cahora Bassa Dam in 1974, nearly 90% of the Zambezi catchment has become regulated and the natural flood cycles of the Lower Zambezi River are now a phenomenon of the past. The Kariba controls 40% of the Zambezi Basin runoff. Flooding in the delta is now dependent on local rainfall-runoff within the Lower Zambezi catchment or unplanned (possibly catastrophic) water releases from the upstream dams (e.g., 2001 floods). These hydrological changes are further exacerbated by the construction of dikes along the Lower Zambezi for agriculture, trains and road networks that prevent medium sized floods up to 13,000 m³/s from inundating the south bank floodplains (Beilfuss, *et al.*, 2001).

“Much of the Lower Zambezi Valley is well suited for livestock production, and livestock grazing activity was closely linked to Zambezi flood patterns. Livestock were typically herded along the riverbanks, where they found the best pasture and water supply. The availability of good quality pasture in the late dry season was especially important, and depended on prolonged flooding during the wet season” (Beilfuss, *et al.*, 2002).

Migratory and local movements of wild ungulates in the delta were opportunistic responses to the availability of different vegetation communities allowing ungulates to meet their year-round life requirements through rotational grazing in response to natural flood cycles (Beilfuss & dos Santos, 2001). Herbivory is an integral part of the succession dynamics of floodplain systems, exerting selective pressure on the delta grassland composition. Many herbivores have co-evolved with plants, acting as dispersers and influencing plant regeneration patterns. Coarse grass (bulk) feeders, especially buffalo and elephant, graze down rank pastures and enhance grazing conditions for the medium to short grass feeders such as waterbuck and zebra. The mulch of grass flattened by large herds of buffalo and elephant also enables greater penetration of rain and results in better primary production of floodplain grasses. Following the ebb line is a zone of

changing width of moist soil (depending on micro relief at each water level), supporting a green flush of vegetation that gradually dries out on its upper margins. Grazing herds follow the green zone and vacate browning lands. During these annual migrations, herbivores provide opportunities for plant regeneration by removing large quantities of emergent vegetation and trampling seed into soils, while browsers remove woody growth at the floodplain periphery (Beilfuss, *et al.*, 2001).

Primarily from the reduction in flooding, relatively drought-tolerant grassland species have displaced flood-tolerant species in the broad alluvial floodplain and saline grassland species have displaced freshwater species on the coastal plain. Coastal mangrove has been replaced by saline grassland at the tidal margin. Of critical importance for large herbivores is the Tussock grass habitat, reduced by 23% over the last 40 years, a major source of food in the wet season grazing areas for buffalo, zebra, waterbuck, etc. migrating from the more deeply inundated floodplains (Beilfuss, *et al.*, 2001).

Soft-leaved grasses and sedges in the swamps, preferentially grazed on by buffalo and waterbuck until floods limited access, have been reduced by 6% over the last 20 years (Beilfuss, *et al.*, 2001). Woody vegetation and thickets invade grasslands and drought resistant less nutritious grassland species replace stressed wetland species of higher nutrient content. Similar patterns have been shown for the Kafue Flats and middle Zambezi Floodplains following river regulation. Cape buffalo are highly susceptible to starvation and high mortality when their pastures dry out early, especially when uncontrolled fires sweep across the delta. Hippo and waterbuck are also vulnerable to poor forage conditions in floodplains (Beilfuss & dos Santos, 2001). This also allows easy access to the game by local hunters, “poachers”, a major problem in the Marromeu Buffalo Reserve and surrounding hunting blocks (Wicker, *pers. comm.*).

“The total area of perennially wet grassland, permanent deepwater swamp, and coastal mangrove is now about 2,600 km² (260,000 ha), or 22% of the total delta area. There has been an 18% reduction in permanently flooded areas since 1960, and a 12% reduction in perennially wet grassland. The average duration of inundation in the hydromorphic vertisols along the western edge of the floodplain has decreased from 4-6 months per year in the past to 2-3 months per year today. These changes suggest that moisture conditions have become limiting in many areas of the floodplain. Most of the delta grasslands now burn during the dry season, and deciduous Acacia savanna covers much of the higher delta plain” (Beilfuss & dos Santos, 2001).

These changes would have begun in 1974 and 1975 with the filling of the reservoir.

It is estimated that between 1976 and 1979, 12,400 buffalo were cropped (Anderson, Dutton, Goodman & Souto, 1990). A sustainable game cropping operation was initiated, with 30,000 animals harvested between 1978 and 1985, but wildlife populations remained strong (Bindernagel, 1980; Tello, 1986 both *In: Beilfuss, et al., 2001*) (Table 7.14). However, civil war and anarchy ended sustainable management of this area. Dutton, Ribaune, Jujumen, Carvalho and Pingo (2001) show buffalo populations for 1994 as 2,346, in 1999 as 2,000, in 2000 as 5,125 and in 2001 as 3,056. The total ungulate population went from 81,570 in 1979 to 4,354 in 2001, a decline of 95%.

Anderson, *et al.* (1990) place the cause for major reduction of wildlife on uncontrolled hunting with military weapons during the protracted civil war. Also, over a period of only seven years – five at the end of the civil war and the first two years following the cease-fire in 1990 – wildlife populations were decimated by illegal commercial meat hunting – (Beilfuss, *et al.*, 2001).

Table 7.14: Wildlife population reduction between 1968 and 1990 Zambezi Delta Complex

Species	1968	1977	1978	1979	1988	1990	% Reduction, 1978-1990
Buffalo	20,000	55,595 (45,000)*	43,992	30,394	11,575	3,696	91.5
Waterbuck	40,300	36,380	46,227	45,653	6,455	4,490	90
Elephant	257	331	361	373	1,554	326	1
Zebra	673	1,340	2,120	2,720	---	1,205	43
Hippo	250	2,820	1,010	1,770	-----	260	74
Reedbuck						260	80-90
Surveyors	Tinley	Tello/ Dutton	Tello/ Dutton	Tello/ Dutton	Chambal	Anderson Dutton, Goodman	

Source: Extracted From Anderson, *et al.* (1990) with permission from Anderson. * Dutton, *et al.* (2001) (Note this reference agrees with other numbers for buffalo).

Prepared by principal author

Beilfuss, *et al.* (2001) also note:

- An increase in human population in order to escape the war.
- Increased desiccation of the swamps associated with the dams.
- Increased human access and increased burning of the grasslands.

All of these factors are believed to have been significant in impacting on the wildlife in this complex. *Coutada* (hunting block) operators in the delta now complain that the foraging quality of the delta grasses has decreased. Similarly, in the Mana Pools, between the Kariba and Cahora Bassa Dams, the frequency of perennial grasses declined with the lack of Zambezi flooding (Beilfuss, *et al.*, 2001). The decline in buffalo numbers in 2001 is said to be from drowning, mostly of young, from the 2001 flood, which was of exceptional magnitude (Dutton, *et al.*, 2001).

The elimination of hippos has probably contributed to the drying out of abandoned alluvial channels and loss of open water areas, the wallowing activities

of hippo being vital in maintaining open water conditions in the many small ponds and distributary channels of the delta (Tinley, 1977 *In: Beilfuss, et al.*, 2000). These changes have been exacerbated by drier conditions across the delta from reduced flooding.

Likewise, the reduction in wildlife grazing pressure has also contributed to the increased extent of wildfires during the dry season. In the 1960s and 1970s, intense grazing by wildlife created a mosaic pattern of grazed and ungrazed grasses (Tinley 1977; Tello & Dutton 1979 both *In: Beilfuss, et al.*, 2000), creating natural firebreaks. With the reduction in wildlife populations, vast expanses of ungrazed floodplain have created highly combustible vegetation at the end of the dry season. Coupled with the general desiccation of the floodplain, wildfires now spread unchecked across extensive areas. Nearly 95% of the delta burns during the dry season and fires penetrate deep into the formerly inundated floodplains. Only the permanently flooded areas remain unburned.

Because of the desiccation of the floodplains, wildlife has unlimited access to the delta floodplain throughout the year, since there are no floods to drive them to the upland margin. The floodplain grasslands are now highly susceptible to over-grazing because they are no longer rested during the flood season each year. The decreased grazing pressure from reduced wildlife numbers has likely prevented further degradation of the floodplain grasslands. As wildlife populations slowly recover in the delta, unless the hydrological conditions in the delta improve, careful management will be required to prevent the widespread degradation of the floodplain grasslands due to over-grazing (Beilfuss, Dutton & Moore, 2000; Beilfuss *et al.*, 2001)

There is a widespread opinion among *coutada* operators and wildlife biologists that the delta can no longer support the large herbivore concentrations it supported

prior to the 1980s (Beilfuss, *et al.*, 2001), implying that this is due to impacts primarily from reduced flooding. Some operators, as Toni Wicker (Wicker, *pers. comm.*) believe that continued poaching into the 21st century is the main cause for the failure of buffalo and other wildlife populations to recover. Anderson, *et al.* (1990) recommend the consideration of artificial flooding. The questions that need answering are, “Why is the population of buffalo in the Marromeu Complex stagnant at around 4-6,000, along with apparently stagnant numbers of other ungulates? What percentage of the failure of the buffalo population to increase exponentially by 400-600 buffalo a year is from continued poaching by a disenfranchised and impoverished community of about 20,000 people surrounding the area, versus the change in habitat from the loss of flooding”? This needs careful investigation followed up by mitigation. In 2005, a meeting took place in Maputo to discuss the possibility of artificial flooding.

7.8.9.4 Kafue, Zambia

The 6,500 km² floodplain ecosystem of the Kafue River, Zambia, the Kafue Flats, was once one of the richest wildlife habitats in the world. Normally, the surrounding grasslands become regularly flooded as part of the natural water cycle of the Kafue Flats. However, the flood regime of the Kafue Flats has been modified by two dams (WWF/Netherlands, 2002), which have disrupted the reproductive cycles of many fish species and therefore populations of piscivorous birds (see Figure 7.5, Kafue River Dams). Reduced flooding is also believed to be negatively affecting wildlife, by prolonging the period of nutritional stress and reducing the area of optimum low flood grazing. Wildlife and fisheries are the principal resources in the Kafue Flats, but poaching and over-fishing are now threatening these (Kamwenesche *et al.*, 2002). Productive grasses have been replaced by aquatic plants in those areas now permanently inundated by

reservoirs. Populations of zebra, wildebeest, sitatunga and the endemic Kafue Lechwe have been greatly reduced (WWF/Netherlands, 2002).

“The most important herbivore of the Central African floodplain is the lechwe antelope, *Kobus leche*. Three races have been described. The Red Lechwe, *Kobus leche leche* is the most widespread of the three species, occurring in the upper drainage of the Zambezi, Kafue, Okavango Delta and the Congo River systems. The other two sub-species occur only in Zambia. The Black Lechwe, *Kobus leche smithemani* is endemic to the Bangweulu Basin and the Kafue Lechwe, *Kobus leche kafuensis* is endemic to the Kafue flats” (Kamwenesche, *et al.*, 2002).

Lechwe is an old Bantu name for antelope. Since the construction of hydroelectric dams in the Kafue Flats in the 1970s, it is thought that the population of Kafue Lechwe has been more than halved: from approximately 100,000 in the 1970s to fewer than 40,000 in 2001 (WWF/Netherlands, 2002). Kamwenesche, *et al.* (2002) provide the following statistics (Table 7.15).

Table 7.15: Decline of Kafue Lechwe population over time

YEAR	ESTIMATE	STANDARD ERROR
1970 (April)	95,040	37,638
1970 (October)	95,075	11,415
1971	94,212	15,958
1972	93,159	21,891
1973	109,612	7,640
1975	80,774	9,860
1981	45,867	6,145
1982	41,345	4,932
1983	41,155	6,247
1988	65,018	7,497
1989	47,145	5,345
1990	44,538	3,723
1999	45,000	-
2002	42,000	-

Source: Kamwenesche, *et al.* (2002) with permission, Dr. Richard Beilfuss, Carr Foundation-Mozambique & Saving Crane Foundation.

Changes in the flooding regime have affected the Kafue Lechwe in several ways (DFID, 2002):

- In the western part of the Flats the decrease in forage grasses and increase in woody and weedy herbaceous plants has reduced lechwe grazing.
- In the eastern part of the Flats the increased area of permanent inundation has reduced the habitat suitable for lechwe from 1,078 km² in 1970 to 930 km² post dam construction. This reduction in suitable habitat means that the lechwe continuously forage in a limited array of vegetation communities, which increases the risk of range deterioration.
- The lechwe breeding system has been adversely affected by changes in flooding patterns.

Acreman *et al.* (2000) also tend to believe that modified flooding has negatively impacted lechwe populations, although poaching is also a factor. They fail to state, however, which they consider most important. Poaching, infectious diseases, grazing pressures, traditional hunting practices, human presence in the area, and small-scale agricultural practices are also major factors responsible for the decline (Siamudaala, Muma, Munang'andu & Mulumba, 2005 *In:* Osofsky, Cleaveland, Karesh, Kock, Nyhus, Starr & Yang, 2005). The population should increase exponentially by at least 10% per annum (Kamwenesche, *et al.*, 2002). If the current population is about 40,000-45,000, it should increase by 4,000 animals per annum, assuming natural morality. However, the population has not increased significantly since the early 1980s, suggesting that 4,000 or more lechwe fail are being killed each year through hunting, habitat loss, or not appearing due to reduced fecundity. Since the limits for legal offtake during this period have been maintained below 2-4% of the population (fewer than 800 animals) and since

there is no evidence of large-scale mortality from disease, one can only conclude that the major causes for the lack of population growth are poaching or reduced fecundity. Poaching is particularly a problem during the period of high flood levels, when lechwe are forced to migrate to the floodplain periphery close to the villages in Muchabi and other areas in the Blue Lagoon (Timberlake, 2000; Kamwenesche, *et al.*, 2002; DFID, 2002). Based on official statistics, Siamudaala, *et al.*, 2005 (*In: Osofsky, et al.*, 2005) estimate that between 1995 and 1999, 4,679 lechwe were legally harvested of which 4,353 lechwe (93%) were hunted for meat and 326 (7%) for trophies, valued at US\$ 47,459 and US\$ 60,315/year respectively. This gives an average annual sustainable harvest rate of 936 animals: 871 for meat and 65 for trophies. It also amounts to an average of 47.7 tons/year of meat consumed by an estimated 39,780 people. Poaching for the bushmeat trade is believed to account for another 50% of the official quota or about 468 lechwe harvested/year, giving a total of 1,404 lechwe harvested/year or about 3-3.5% of the current population.

The principal author personally hunted a lechwe with professional hunter Rory Gellatly¹⁷⁴ in the late 1990s. He observed pickups loaded with up to five or more lechwe each; some of trophy quality taken by local hunters who are said to chase the herds with their vehicles. The posted game guard asked the principal author to shoot a couple of extra ones for him and his friends, which was refused.

The modified flood regime is also believed to be contributing to a reduction in the lechwe population since it is very important to its life cycle.

“The most important factor found to affect the distribution of females and calves was the distance from the waterline, followed by vegetation community selection, followed by preference for shorter grass. Mothers retreat to secluded areas with tall grass

¹⁷⁴ Rory Gellatly, P.O. Box 300050, Lusaka, Zambia, Member Professional Hunters Association of Zambia (PHAZ).

where they give birth to their young, and the highest densities of Lechwe occur in the Vossia-Echinocloa floodplain grasslands. All of these conditions are affected by the flooding regime, and the cumulative effects of Itezhitezhi Dam and Kafue Gorge Dam may be a reduction in the extent and quality of available habitat on the floodplain" (Kamwenesche, *et al.*, 2002).

Zonation of key vegetation of the floodplains has been described as follows by Ackerman, *et al.* (2000):

Permanent Swamp:

Vossia cuspidata,
Echinochloa scabra + Cyperus papyrus,
Leersia hexandra + Echinochloa
pyramidalis

Deep Flooded Grassland Long Flood

Oryza perennis + Echinochloa
pyramidalis

Deep Flooded Grassland Short Flood

Leersia hexandra + Acroceras macrum
+ Paspalum commersonii

Shallow Flooded Grassland Long Flood

Setaria avettiae + Vetiveria nigritania

Shallow Flooded Grassland Short Flood

Cynodon dactylon
Setaria sphacelata + Themeda triandra

Floodplain Margins

Hyparrhenia rufa + Setaria sphacelata
+ Panicum coloratum

A total of 275 buffalo were observed: a herd of 240 buffalo was observed on the floodplain of the Blue Lagoon National Park and two herds of 20 and 15 in the Kafue game management area. This is a substantial increase over the 1999 survey, which recorded 188. Historically, buffalo were very common on the Kafue Flats, but have been subject to heavy hunting pressure (Kamwenesche, *et al.*, 2002). The total population of hippos on the flats is unknown. The 1990 estimate was more than 80 (Kamwenesche, *et al.*, 2002). As it is difficult to observe, the exact number of sitatunga in the Kafue Flats is unknown, though numbers are believed

to have significantly declined over the past decades from habitat loss and poaching (WWF/Netherlands, 2002). Although past surveys suggest that sitatunga were once common on the Kafue Flats, the current population is probably less than 100 individuals, (Kamwenesche, *et al.*, 2002). Historical accounts suggest there were many thousands of zebra on the Kafue Flats earlier in the century, often in very large aggregations of up to 1,000 or more. Today, estimates are somewhere between 500 and 2,000 (Kamwenesche, *et al.*, 2002).

More than 450 bird species occur in the Kafue Flats, some all year round and some as season migrants. The Kafue Flats lie along a major migration route. Palearctic migrants¹⁷⁵, along with seasonal migrants from the rest of Africa, frequent the area. White pelican (*Pelecanus onocrotalus*), pink-backed pelican (*Pelecanus rufescens*), open-bill storks (*Anastomus lamelligerus*), Goliath herons (*Ardea goliath*) and spur-winged geese (*Plectropterus gambensis*) occur here, alongside what is thought to be Africa's largest population of the highly endangered wattled crane (*Bugeranus carunculatus*) that is highly reliant on wetlands for breeding and are easily disturbed. With fewer than 10,000 remaining, the wattled crane is Africa's rarest crane, its habitat impacted by dams and decreased flooding on the Kafue River (WWF/Netherlands 2002). A recent coordinated international survey effort in Botswana, Mozambique, South Africa, Tanzania and Zambia suggests that the population may even be less than 7,000, with no more than 4,000 wattled cranes in Zambia (Kamwenesche & Beilfuss, 2002). Concern also exists that modified flood regimes are endangering the wattled crane in the Zambezi Delta (Beilfuss & dos Santos, 2001) – see 7.8.9.3 under Zambezi Delta.

In an undisturbed floodplain, the breeding cycle of wattled cranes is intimately linked to the natural flood cycles. Wattled crane pairs are “triggered” to nest as

¹⁷⁵ Biogeographic region that includes Europe, Africa north of the Sahara and Asia north of the Himalaya Mountains

floodwaters begin receding after peak flooding. Nesting in deep open water after the major flood rise and crest ensures that nests will be protected from predators and wildfires, but will not be drowned by further rising floodwaters. As floodwaters slowly recede, wattled cranes raise their single chick on the pulse of exposed plant and insect life, especially tubers of the *Eleocharis* spike rushes. When flooding patterns are erratic or mistimed, wattled crane pairs may not be induced by hydrologic conditions to initiate nesting. Where nesting is attempted, unanticipated water level rises can drown nests and food sources. Rapid water level drawdown in the floodplains may expose nests to wildfires and predators and limit food availability. Prior to dam construction on the Kafue River, 40% of wattled crane pairs attempted to breed in a year of normal flooding conditions, while only 3% of all pairs bred in a year of negligible flooding conditions due to drought (Beifuss & dos Santos, 2001; Kamwenesche & Beifuss, 2002).

When the Itezhitezhi Dam altered the hydrological regime of the Kafue Flats, Konrad (1981 *In:* Kamwenesche & Beifuss, 2002) predicted a dramatic restriction in wattled crane nesting sites and feeding area. Despite these concerns, there have been no detailed studies of wattled cranes and wetland biodiversity in the Kafue Flats during the past 25 years of Kafue River regulation. A 2001 survey counted a total of 756 birds, giving an estimate of 967 wattled cranes for the sampled area. One flock of 460 birds was observed in the Blue Lagoon National Park. Other large flocks included groups of 35, 19, 17 and 14 birds, mostly on the north bank. Although it is possible that the estimates from the 1970s and 1980s were too high—based on difficulties in extrapolating from large flocks—it seems very likely that there has been a substantial decline in the population of wattled cranes on the flats over the past 20 years, perhaps most significantly between the 1980s and 1990s. It is unknown whether this decline represents a real decrease in the global wattled crane population or a shift in seasonal or annual distribution. The peak breeding months of April/May and August coincide with high levels of

human activity such as livestock grazing from May-July when upland fodder is limited. Uncontrolled fires were observed in several areas. There is a need to better understand how sudden flood releases from the Itezhitezhi Dam affect the feeding and nesting activities of wattled cranes (Kamwenesche & Beifuss, 2002).

Domestic livestock, particularly cattle, are widespread on the Kafue Flats, with several thousands in the Kafue game management area. Conflicts between cattle grazing and wildlife utilization, especially lechwe and zebra, are a major conservation issue for the Kafue Flats. The question of competition for food and transmission of diseases between lechwe and livestock has also been raised (Kamwenesche, *et al.*, 2002).

7.8.9.5 Waza Logone Floodplain, Cameroon

The Waza National Park lies in the Far North Province of Cameroon in a Sudano-Saharan grassland ecosystem. It was created as a hunting reserve in 1934 and then declared a national park in 1968 (Hakizumwami, 2000). The Waza National Park has an important animal diversity, especially avifauna with 379 species. There are at least 30 species of mammals, including elephant (*Loxodonta africana*), giraffe (*Giraffa camelopardalis*), lion (*Panthera leo*), spotted hyena (*Crocuta crocuta*), striped hyena (*Hyaena hyaena*), kob (*Kobus kob kob*), topi/korrigum (*Damaliscus korrigum*), roan antelope (*Hippotragus equinus*), red-fronted gazelle (*Gazella rufifrons*), warthog (*Phacochoerus aethiopicus*), Nigerian bohor reedbuck (*Redunca redunca nigeriensis*) and Grimm's duiker (*Sylvicapra grimmia*), in addition to smaller or less abundant species. The latter two species (reedbuck and Grimm's duiker) have become extremely rare and might join the list of species that have become locally extinct over the last few decades: the leopard (*Panthera pardus*), cheetah (*Acinonyx jubatus*), sing-sing waterbuck (*Kobus defassa defassa/Kobus ellipsiprymnus unctuosus/Kobus*

defassa unctuosus), bushbuck (*Tragelaphus scriptus scriptus*) and red flanked duiker (*Cephalophus rufilatus*) (Loth, 2004).

Impacts on Migratory Birds

It is believed that Lake Chad and its related floodplains are along key migratory routes, both of which have been adversely impacted as waterbird habitat by the SEMRY irrigation scheme and drought (Loth, 2004).

Impacts on Elephant and Livestock Populations, Waza National Park

Prior to 1947, there were no elephants in the 1,700 km² Waza National Park (de Iongh, Tchamba, Tamis, Van't Zelfde, Prins, de Haes, Bauer & Tiawoun, 1999; Loth, 2004). In 1962, elephant numbers had increased to a population of 150. Total dry season numbers in Waza were 465 in 1978, one year before the Maga Dam was constructed (de Iongh, Tchamba, Aarhaug & Verhage, 2004). By 1996, the elephant population numbers reached 1,100 and are believed to be at or beyond carrying capacity at about 1/km². The increased elephant population is a combination of natural reproduction plus in-migration from Nigeria and Chad (de Iongh *et al.*, 1999), some say to escape the Chadian war of the 1980s. By 2001, the number of elephants was estimated to be 1,140 (de Iongh, *et al.*, 2004). While the *Acacia seyal* woodlands of the Waza Park were important to feeding the elephants, they were not enough to support them year-round, pushing the elephants onto the floodplains to feed on perennial grasses such as *Echinochloa pyramidalis*, *Vetiveria nigritana*, *Oryza longistaminata* and *Hyparrhenia rufa* (Loth, 2004).

There are three elephant sub-populations (de Iongh, *et al.*, 1999; de Iongh, *et al.*, 2004):

- **Sub-Population 1, Waza Kalamaloué area.** Northern part of Waza in the wet season, migrating north to the Kalamaloué Park in the dry season (Jan-Feb) and returning at the end of the dry season (May-June);
- **Sub-Population 2** resides year-round in the Waza National Park; and
- **Sub-Population 3** tended to stay in the central and southern part of the park. Today, move south out of the park during the first rains (June/July), becoming problem animals in agricultural areas, and return in November-December.

The construction of the Maga Dam in 1979 resulted in decreased flooding and the succession from perennial (*Echinochloa pyramidalis* and *Oryza longistaminata*) to less palatable annual grasses (e.g., *Sorghum arundinaceum*). Just prior to the Maga Dam, the first 30 elephants from the third population were recorded moving south out of the park to the area of Mindif. With the Maga Dam in place, the number of elephants moving north decreased, while those moving south (Loth, 2004) increased at the onset of the rains. Two artificial waterholes in the *Acacia seyal* woodlands, along with decreased flooding and less palatable grasses, resulted in increased pressure on and degradation of the woodlands (de Iongh, *et al.*, 2004).

Between 1991 and 1997, the crop raiding elephants leaving Waza to the south during the rainy season increased from 50 to 330, significantly increasing the human-elephant conflict. Annual crop damage was valued at US\$ 206,000 compared to the US\$ 51,000 generated from elephants by tourism (Tchamba, 1998).

During the rainy season, only the cattle herds of the settled agricultural stock keepers, the Musgum, graze the floodplains on the left bank of the Logone River. During the dry season, 3,000 nomadic and semi-nomadic pastoralists such as the Fulbé (Fulani) and Shuwa Arabs from as far away as Nigeria enter the floodplain for six to eight months with over 200,000 cattle grazing on the rich perennial grasses. This is about 33% of the total cattle population of the Far North Province of Cameroon in which the left bank floodplains of the Logone and Waza are found. The nomadic Fulbé keep the larger more robust *bo'deiji* red long-horned breed of cattle, which is better adapted to the rigors of transhumance, while the agro-pastoral more settled Fulbé keep the smaller *gudaali* cattle. The sedentary Musgum keep an even smaller breed better adapted to the rainy season and flooding (Loth, 2004).

With regard to livestock, after the construction of the SEMRY rice irrigation scheme, the dry season herd was reduced to 80,000 tropical livestock units (TLU), a TLU being a 250 kg animal.¹⁷⁶ The area grazed was 1,200 km². It is estimated that the loss in cattle production was Euros 2,285 (US\$ 2,696) per km² or 11,750 TLU/km². The total loss was estimated at Euros 1,402,500/year (US\$ 1,654,950) to the pastoral economy resulting from decreased flooding and associated change from perennial dominated grasses to less nutritious annual grasses (Loth, 2004).

Section 7.10.7.5, Waza Logone Floodplain, Cameroon goes into some detail on the use of artificial flooding as a mitigative tool to overcome these problems.

¹⁷⁶ South Africa, the most advanced country in Sub-Saharan Africa in savanna research, uses a large-animal stock unit of 450 kg, about the size of a full-grown steer. Depending on the savanna type and thus energy available from the veld, the number of animals by species/large-animal stock unit is determined. This is used as an aid to the reserve, park or game ranch manager in determining the mix of wildlife and/or livestock on a property (Bothma, 1996).

7.8.9.6 Lower Kihansi Dam, Tanzania

With funding from the International Development Association (IDA), the World Bank's lending agency for the poorest countries, the Lower Kihansi Hydropower Project (LKHP) with a 25-meter dam and relatively small 26-ha reservoir on the Kihansi River in Tanzania's Rufiji Basin destroyed an 800-meter-high waterfall and brought development to a protected natural area, the Kihansi Gorge ecosystem, one of 25 "Global Biodiversity Hotspots" as designated by the IUCN. It is home to numerous endemic flora and fauna species (e.g., Kihansi spray toad, *Nectophrynoides asperginis*) that live in the spray of the gorge's 800-meter-high waterfall and are at risk of extinction because of this dam. The World Bank's environmental assessment only covered the most basic requirements, merely analyzing impacts on habitat inundated by the reservoir, but not downstream impacts on the gorge (IRN, 2001c).

7.8.10 Livestock and Wildlife Diseases

Reservoirs can provide habitat for livestock and wildlife disease vectors (this is also applicable to humans), and in the displacement of wildlife from the inundation zones have brought diseases such as sleeping sickness into livestock areas previously free of this disease.

7.8.10.1 Senegal River

The permanent presence of stagnant fresh water behind the Diama Dam favored the development of parasitic diseases affecting livestock, especially those caused by liver flukes with snail vectors as intermediate hosts. These ailments were rare in the delta prior to the Diama and are now very common. They have a major impact on livestock productivity. Herders have to expend major efforts to keep

livestock from entering the infested waters and to provide drinking water away from the river's edge. The epidemic of Rift Valley Fever, which occurred at the filling of the Diama Reservoir, probably a one off event, also caused great losses to livestock from abortions (Hamerlynck, *et al.*, 2000).

7.8.10.2 Kariba Reservoir, Zimbabwe, Zambezi River

Having nothing to do with Operation Noah (program to capture wildlife from Kariba inundation zone – see 7.8.9.3), the majority of wildlife on its own, including elephant and buffalo, moved out of the Kariba inundation zone as the reservoir filled into both the game reserves and into areas where the Ba-Tonga had been resettled. Both the people and wildlife were compressed into areas that were unfamiliar to them. Wildlife already existed in the game reserves, thus wildlife coming out of the inundation zone resulted in many areas exceeding carrying capacities for the vegetation to support them. For the first three years, until torpedo grass (*Panicum repens*) developed along the draw down zone of the Kariba Reservoir, hippos were found up to 27 km inland looking for grazing (Thomson, *pers. comm.*).

At the same time, major people and elephant/buffalo conflicts occurred as they invaded domestic crops. In the first year of resettlement, Ron Thomson, then a young Problem Animal Control (PAC) officer shot 600 PAC elephants and 100s of buffalo invading the farm plots of the Ba-Tonga, covering 12,950 km² (5,000 mi²) of control area with his team (Thomson, *pers. comm.*; Thomson, 2003).

Ron Thomson (*pers. comm.*) developed the Chizazira Game Reserve, blasting a 37 km (60 mi) road up the escarpment, which at one place climbed 2,000 feet in elevation over just 2.5 km (4 mi) of road. He observed that this PAC, along with the turmoil of 1,000s of displaced Ba-Tonga hewing out new lands and occupying

most springs and waterholes, pushed/compressed the elephant and buffalo even further from the Zambezi, up onto the 2,000 foot high mountain plateau of the Chizazira Game Reserve and into the Chete area. The entire miombo woodlands (*Brachysteigia spp.*) of the Chizazira Game Reserve were destroyed by elephants between 1964-1968, the same period in which elephant and buffalo moved southwards and eastwards out of the Zambezi Valley into the Rhodesian Highveld onto white-owned commercial farms and ranches. They carried with them sleeping sickness that was transferred to the livestock, something that had not existed before in these highland areas. Most tsetse fly along the Zambezi River was *Glossina morsitans*, which only carried *nagana* or cattle sleeping sickness. Human sleeping sickness here was very rare and carried by the *Glossina pallidipedes*, which lives only in deep shady areas (Thomson, *pers. comm.*; Thomson 1997; 2003).

A tsetse corridor was set up, running the length of the escarpment along the Zambezi, ranging from 13-155 km (5 to 60 miles) wide. Ron Thomson ran PAC in the Sebungwe Sector, inland from the upper part of the Kariba Dam, between the Sengwa River and Devil's Gorge where the Zambezi enters the impoundment. Thomson's job in the Sebungwe area was to shoot out all elephant and buffalo. Local Ba-Tonga called *magotshas*, a Tonga word for "butcher", were hired. They were equipped with British 303 Enfields and asked to shoot out all warthog, bushpig, kudu and bushbuck that were believed to be the intermediate host of the tsetse fly, which carried the sleeping sickness parasite. The *magotshas* shot everything: roan, sable, and zebra, wounding many elephant and buffalo in the process and taking lesser game that was not part of the mandate. Over the period of the tsetse fly eradication, officially 40,000 buffalo, elephant, kudu, bushbuck, warthog and bushpig were killed, mostly in the Sebugwe area of Binga and the Copper Queen Area. Ten's of thousands of other species were also taken. Unofficially, given the efficient work of the *magotshas* for non-target species, this

number could have easily doubled, making the 2,000 game species “saved by Operation Noah” relatively insignificant (Thomson, *pers comm.*; Thomson 1997). Thus, the Kariba Dam set off a series of events that disrupted the entire ecology and socio-economics of the area, from which the wildlife and people have never completely recovered.

7.9 SOCIO-ECONOMIC IMPACTS OF DAMS IN AFRICA

7.9.1 Dam Impacts on Displacement of People

The World Commission on Dams (WCD) (WCD, 2000) estimates that since about 1950, the beginning of the “big dam era”, globally large dams have forced 40-80 million people from their homes and lands, with impacts including extreme economic hardship, community disintegration and an increase in mental and physical health problems. Indigenous, tribal and peasant communities have suffered disproportionately (McCully, 2001; IRN, 2003). People living downstream of dams have suffered from water-borne diseases and the loss of natural resources, especially the floodplain ecosystem, on which their livelihoods depended (IRN, 2003). Estimates of people displaced by major dams in Africa are contained in Table 7.16.

Table 7.16: Major dams in Africa that have affected local communities

Name of Dam and Year(s) of Completion	River and Country	Impacts on People	Source
Akosombo Dam, 1965	Volta River, Ghana	80,000-84,000 displaced from 700 communities	IRN, 2000d; Hitchcock, 2003
Aswan Dam, 1902, 1912, 1934	Nile River, Egypt	Hundreds of Nubians and others displaced	Hitchcock, 2003
Aswan High Dam, 1970	Nile River, Egypt and Sudan	120,000 people displaced	Hitchcock, 2003
Cahora Bassa Dam, 1974	Zambezi River, Mozambique	1) 42,000 displaced in inundation zone 2) 350,000 people impacted downstream along floodplain	1) Isaacman & Sneddon, 2000 2) Beilfuss & dos Santos, 2001
Kainji Dam, 1968	Niger River, Nigeria	1) 44,000 displaced in inundation zone 2) 100s of thousands displaced from loss of floodplains downstream	1) McCully, 2001; Hitchcock, 2003 2) McCully, 2001
Kariba Dam, 1959	Zambezi River, Zambia and Zimbabwe	57,000 displaced total: 23,000 displaced – Zimbabwe side 34,000 displaced Zambia side	McCully, 2001; IRN, 2001a WCD, 1999; Thomson (<i>pers. comm.</i> ; 2003), IRN, 2001a
Kiambere Dam, 1988	Tana River, Kenya	7,000 displaced	McCully, 2001 & Hitchcock, 2003
Kihansi Dam, 2000	Kihansi River, Tanzania	22,000 people directly affected	Olsen, 2001
Lesotho Highlands Water Project, three dams; Katse Dam (1997), Muela Dam (1998) and Mohale Dam (2001) See: www.en.structure.de/structures for dates of start and completion of dams	Orange River, Maloti Mountains, Lesotho, diversion some say 40% (Tarico, 2002) to 67% of the Senqu/Orange River to another basin to supply the Greater Pretoria, Johannesburg area with water	1) Three dams dispossess 24,000-30,000 rural farmers of assets (including homes, fields and grazing lands) and deprive many of their livelihoods, totaling 4,645 ha pasture, 1,500 ha arable land from Phases 1A and 1B alone; 2) Katse Dam, directly displaces 2,000 people (300 households), 20,000 indirectly from loss of 925 ha arable land and 3,000 grazing land 3) Mohale Dam inundates 550 ha, resettlement of 400 families & b. impacting 7,400 people 4) Phase 1A (Katse and Muela Dams) adversely impacts 24,000 people, loss of 4,635 ha grazing land and 1,500 ha arable land, 312 homes relocated. Phase 1B (Mohale Dam), 7,400 people impacted, 300 homes relocated. 5) Downstream population at risk: 155,000 people (8,300 households in 338 villages) living along the rivers downstream of the LHWP structures and using the rivers for subsistence.	1) IRN, 2000a; IRN, 2001b IRN (2005) same figures but uses the term people instead of farmers 2) Bond, 2002 3a.. Bond, 2002 b. IRN, 2000a 4) Tarico, 2002 5) IUCN, 2002; Horta & Pottinger, 2005

Table 7.16 (Cont.): Major dams in Africa that have affected local communities

Name of Dam and Year (s) of Completion	River and Country	Impacts on People	Source
Maga Dam, 1979	Logone River, dam and 100 km embankment on left bank for irrigated rice	Adverse long-term impact on maximum 25,000 rural people using downstream floodplains for fishing, dry season grazing and agriculture	Njomaha, <i>pers comm.</i>
Maguga Dam, 2001	Nkomati River, Swaziland	66 households displaced	Hitchcock, 2003
Manantali Dam, 1988	Bafing River, Mali	1) 11,000 displaced behind dam, 2) Others say 10,000 displaced behind dam 3) 500-800,000 people displaced from loss of downstream flooding on Senegal River in Senegal & Mauritania	1) McCully, 2001; Hitchcock 2003 2) Diarra, Dolores, Yaouaga & Maiga, 1995 3) WCD, 2000 & Ryder, 2001
Masinga Dam, 1981	Tana River Kenya	6,000 people displaced	Bobotti, 2000
Roseires Dam, 1966	Blue Nile, Sudan	10,000 people displaced	Hitchcock, 2003
Ruzizi II Hydroplant	Rwanda/Zaire Border	15,000 people were displaced – more than 111 times the World Bank's original estimate.	McCully, 2001
Prepared by Principal Author			

“Typically the people to be displaced by a reservoir are underestimated, and often the numbers of people adversely impacted downstream from modification of floodplains are also underestimated or ignored altogether. Often the process of moving people from the area to be flooded is rushed and accompanied by violence and intimidation. The general impoverishment of communities, social disruption, trauma and health impacts are more severe on women than on men. Irrigation schemes tend to be badly managed, destroy soils, bankrupt small farmers, and turn lands that fed local people to production of export crops. Dams assist the powerful and wealthy to confiscate ‘Common Lands’

used for grazing, forestry, collection of herbal medicines, etc. of local communities – the politically weak - for irrigation. Often local people lose their lands to speculators. Marginalized ethnic minorities make up a disproportionately large percentage of those who lose their lands and livelihoods to dams. The remote mountain valley, forest or deserts are often their last refuge from cultural obliteration. This displacement often traumatizes entire communities, who have strong spiritual and ancestral ties to the lost land” (McCully, 2001).

Shocking as these case studies may seem, it is believed that forced relocation is more common than not across Sub-Saharan Africa as a result of the creation of both dam schemes, and parks and protected areas. Chapters 3 and 11 discuss a number of such relocations dating from colonial times including:

- 3.8.1 Land Compression Among the Last Hunters and Gatherers, Ju/'hoansi of Nyae Nyae, Eastern Bushmanland, Namibia.
- 3.8.2 Land Compression among the Bisa, Luangwa Valley.
- 3.8.3 Land Compression and British Colonial Policy, Tanzania (Tanganyika).
- 3.8.4 Land Compression and the Maasai of Kenya and Tanzania.
- 3.9.1 Eco-Genocide and the Elephant People.
- 3.9.2 Eco-Genocide and the San of the Central Kalahari Game Reserve (CKGR), Botswana.
- 3.9.3 Eco-Genocide and the Ik, the Mountain People.
- 3.11.1 Population, Kikuyu and the Mau Mau.
- 11.11.2 Donor Driven Conservation, Lake Mburo National Park (LMNP), Uganda.
- 11.11.5 Transfrontier Conservation Areas (TFCAs), Southern Africa.
- 11.11.6 Eco-Genocide in Southeastern Cameroon, the Forest People and the *Dobi Dobi*, More Parks and Protected Areas.

Forced relocation causes multidimensional stress (World Bank, 1982 *In: Colchester*, 1994). These stresses include (Colchester, 1994):

- Psychological stresses from loss of home and ancestral grounds, fear of the unknown future, vulnerability in being unable to protect one's home or surroundings.
- Physiological stresses appearing as health problems.
- Socio-cultural stresses such as those linked to the ancestors tied to the old home and land, loss of respect by society for traditional leaders that are made impotent by forced relocations.

"Societies that are removed from their lands not only lose the economic basis for their survival, but 'a major reduction in their cultural inventory due to a temporary or permanent loss of behavioral patterns, economic practices, institutions and symbols'" (Scudder & Colson, 1982 *In: Colchester*, 1994).

Compensation is usually inadequate (Scudder & Colson, 1982 *In: Colchester*, 1994).

"Thayer Scudder of the University of California has noted that 'forced resettlement is about the worst thing that you can do to a person short of killing him'" (Claxton, 1986 *In: Colchester*, 1994).

7.9.1.1 Senegal River

The Manantali's huge reservoir submerged almost 500 km² (50,000 ha) of fertile farmland and forests. The Manantali Reservoir caused the involuntary resettlement of 12,000 people (Ryder, 2001). GFCC (1980b) predicted that 13,000 people would be involuntarily resettled, while Diarra, Koenig, Yaouaga and Maiga (1995) estimated that the number would be 10,000 people. While the affected communities were allowed to select the resettlement sites themselves,

many families did not receive sufficient agricultural land and grazing grounds (Bosshard, 1999). The planners of the resettlement program for the Manantali failed to recognize that the sustainability of agricultural lands of the resettled communities would require a reserve of fallow land at least equal to that on which crops are grown since the productivity of these lands depended on slash and burn agriculture and ideally fallow periods of 20 years or more, although with increasing populations, fallow periods in West Africa were diminishing and/or even disappearing. The importance of common land to provide grazing for livestock was also ignored. The importance of women's kitchen gardens and wild foods gathered by women was also overlooked. Slashing the size of landholdings and people's access to the commons brings a risk of increasing hunger in the wake of an eviction – an ironic fact given that most dams are built with the rationale of increasing food production through irrigation (Diarra, *et al.*, 1995; McCully, 2001).

Once the Manantali Dam was built, however, the floodwaters needed for growing sorghum and keeping pastures fertile downstream in the valley all but disappeared. Once abundant fisheries collapsed and the valley became infested with waterborne diseases. According to the World Commission on Dams (WCD), between 500,000 and 800,000 people living downstream of the Manantali Dam lost all or part of their means of survival due to the virtual elimination of the river's annual floods (WCD, 2000; Ryder, 2001). Artificial flooding has been minimal. With the installation of hydropower stations in the Manantali, the chance of viable artificial floods becomes even more remote, though modeling by GFCC allowed for this over a 15-year period. Artificial floods could become a permanent process in the management of the Manantali Dam, though it is possible that a trade off would be income lost from a reduction in hydropower output (Section 7.10.7.1, Senegal River).

7.9.1.2 Gambia River

There did not appear to be any major village within the inundation zone of the Balingho Barrage. Major long-term adverse impacts were projected to result in the displacement and loss of livelihoods by as many as 43,099 women who depended on the 12,930 ha of tidal rice that would be permanently lost as a result of the Balingho Reservoir (University of Michigan, 1985c) (Table 7.17):

Table 7.17: Number of women who would lose their tidal rice fields as a result of the Balingho Barrage

Area	Ha	Number of Women
Tendaba To Balingho	1,930	6,433
Balingho To Kuntaur	11,000	36,666
Total	12,930	43,099

Source: University of Michigan (1985c), for USAID public domain.

The University of Michigan (1985a) study estimates that as many as 100,000 people lived within several kilometers of the floodplain that would be inundated by the Balingho Reservoir, estimating a minimum of 15,000 people who would have to be resettled. With the exception of the proposed Kekreti and Sambangalou Dams, displacement of people by the high dams was projected to be relatively minor, as these dams were for the most part located in undeveloped portions of the basin (Table 7.18):

Table 7.18: Agricultural lands and villages inundated by proposed high dams on the Gambia River

Proposed Reservoir/Altitude (m)	Agricultural Lands in Production in Inundation Zone (Ha)	Villages in Inundation Zone	Villages on Edge of Reservoir Jeopardized
Kekreti/65 (IGN)	1,705	20-28 (1)	16-20
Sambangalou/218 (IGN)	6,030 (Low Estimate 1,383)	9	12
Medina Kouta/204 (IGN)	1,968 (Low Estimate 392)	5	3
Kouya/300 (IGN)	283	7	8
Kouya/250 (IGN)	265	5	3

(1) (AHT/HHL, 1984; West, 1984 both *In: Harding & DeGeorges, 1987*)

Source: Harding & DeGeorges (1987)

7.9.1.3 Zambezi River

Kariba Dam, Zambia

It is believed that the name Zambezi comes from *kasambabesi*, a name brought by the Portuguese from the coast, which means that only those who know can cross/swim. Most people called it the big river, the big one or the river that could never run dry – the only truth that will never end, a holy gift from God, which gave them food like a mother. The people living along the Zambezi River, which was to become the inundation zone of the Kariba Dam, referred to themselves as the “river people” or *bamulwizi*. They were hunters of elephant, cultivators on flood recession land and fishermen. They used the Tonga, Leya or Dombe speaking variations of the Tonga language and lacked strong traditions of centralized political authority, such as kings. It is claimed that these various names were used so that if the enemy sought the Tonga, they would sink their canoes and claim to be part of another tribe. They had many shrines along the

river, sacred pools, waterfalls and graves on islands. Many of the pools and waterfalls were used to bring rain through senior mediums or *mpande* (McGregor, 2003 *In:* Beinart & McGregor, 2003).

The actual resettlement of about 34,000 people on the Zambian side (WCD, 1999; IRN, 2001a; Thomson, *pers. comm.*) of the dam was begun at short notice once the decision to build was made (Table 7.16). The police in the then British colony of Northern Rhodesia (Zambia) shot dead eight villagers and wounded over 30 others in a confrontation during the poorly conceived and trauma ridden crash program to clear lands that were to become the Kariba Reservoir. Anthropologist, Elizabeth Colson, describes the 1958 evacuation to a resettlement area of some 57,000 Gwembe Tonga/Korekore people (on the Zambian and Zimbabwean sides of the dam) displaced by the Kariba: "They rode the swaying, open lorries for a hundred miles, over rough roads, in the blazing sun of the hottest period of the year...to reach an unknown land they dreaded...The misery of the trip was increased by nausea...They emerged exhausted sick to find themselves in what they regarded as a wilderness..." (From Scudder, 1993 *In:* McCully, 2001). During a two-month period shortly after resettlement, outbreaks of sleeping sickness, dysentery, measles and chicken pox killed more than 121 Kariba oustees, mostly children. Nearly a year later in 1959, an unexplained disease outbreak claimed the lives of 56 women and children.

On the Zambian side of the reservoir, anthropologists, Colson and Scudder, conducted a long-term study on resettlement showing that most of those moved on the northern bank of the Zambezi went into the Zambian hinterland, settling amongst host communities. Lusitu, to which 6,000 people moved on a second removal and Siameja have become dustbowls (WCD, 1999) due to the increased human population, which has exceeded the ability of the soils to support it. Tribal leaders (WCD, 1999) and mediums of ancestral spirits (McGregor, 2003 *In:*

Beinart & McGregor, 2003) lost much of their authority, as they were viewed with less respect due to having failed to prevent the forced removal. The results were land shortage, decimated livestock numbers, built up in the good years of the 1960s, and falling crop yields on mostly unsuitable land. This, along with Zambia's plunge into national bankruptcy and the official designation at the time as the country having the fourth highest percentage (80%) of rural poor, removed the possibility of the Tonga adapting their agricultural skills so that they could participate in the newer economic activities around the lake, or of escape to and absorption by the formal economy.

The major weakness of the resettlement program was that it failed to understand the intricate manner in which the Valley Tonga secured a living along the Zambezi. This led to poorly conceived resettlement and compensation that was inadequate. The Valley Tonga were moved mainly to "land" surveyed primarily as areas suited topographically for settlement, with little or nothing done to match soils, climate and their productive capability to the ecology of the Tongas' previous homes along the river. Fishing, though important in the beginning, could not serve all the families. This resulted in many settling far away from the lake where tsetse fly, poor soils, disappearing rainwater and unreliable harvests made it hard to cope. There is ample evidence to suggest that such marginal agricultural land is leading to soil and vegetation degradation and ultimately to desertification. "Today, the second generation after resettlement speak of a large out-migration of younger people to more hospitable areas with better facilities, land and greater access to markets" (WCD, 1999).

Kariba Dam, Zimbabwe

On the Zimbabwean side of the reservoir, the condition of the 23,000 resettled Tonga is similar to that of Zambia, mostly inland and the shore hard to reach.

Most of the shoreline went under public use, mainly as parks, partly in response to the emotions and with the help of private donations unleashed by Operation Noah, the highly publicized exercise that rescued animals trapped on islands as the waters rose (WCD, 1999; Thomson, *pers. comm.*; 1997) (see Section 7.8.10.2, Kariba Reservoir, Zimbabwe, Zambezi River).

The people were obliged to move into the interior away from the floodplains of the Zambezi that had provided them with their livelihood. There were 23 Ba-Tonga chiefs and their constituencies in the upper half of the lake: the Sengwa River dividing the lake into an upper and lower half (Thomson, *pers. comm.*). Those people who moved first were able to find pockets of black alluvial soil on which to grow their giant sorghum, but the vast majority of people ended up on ridgelines dominated by Kalahari sands. The giant sorghum grew poorly on the Kalahari sands, which were nutrient poor. The people were able to get about two years of production out of these sands and then were obliged to move on. A way of life was destroyed, namely permanent settlements along floodplains tied to the annual flood cycle of the Zambezi. In order to survive, the Ba-Tonga had to break up into smaller family units who relied on shifting slash and burn agricultural for survival. The people became dependent on food aid (Thomson, *pers. comm.*).

An attempt was made to provide them with a lower yielding faster growing sorghum more suited to the sandy soils. This sorghum was 0.9 meters (3 feet high) and matured in three months compared to six months for the traditional late maturing giant sorghum that grew 3.6-4.3 meters (12-14 feet) high (Thomson, *pers. comm.*).

Unfortunately, politics came into play. In 1965, the Unilateral Declaration of Independence (UDI) had been declared by the Smith government for Southern

Rhodesia, with its white government, that had not been independent from Britain but had practiced self-governance since 1923. A black independence movement was gaining strength. Black politicians told the Ba-Tonga that this new type of sorghum being given by the white man would make the men impotent. The women, who saw one of their major roles in life as childbearing and rearing, quickly put a halt to their men cultivating this sorghum. The Ba-Tonga have never recovered from their removal along the Zambezi, to this day remaining impoverished, dependent on the state and in a state of cultural deprivation, having lost their independence, pride and dignity (Thomson, *pers. comm.*; 1997).

The Zambezi River Authority plans to tax the water used for power generation to partly fund development programs and to attract donors. This move sets up a potential link between those removed from the lake 40 years ago to those who now benefit from the cheap generation of electricity throughout the region (WCD, 1999). Given the recent history of radical land reform beginning in 2000 and deteriorating economic conditions in Zimbabwe, it is unlikely that such goodwill will happen anytime soon. The poor and disenfranchised in all levels of society will continue to suffer in anonymity.

Cahora Bassa Dam, Mozambique

“There were far-reaching consequences for the displaced communities whose homelands and farms were flooded to create the massive reservoir. Yet it was not simply being evicted from their homes and ancestral lands that proved so devastating. The Zambezi peasants were herded into strategic hamlets with few basic amenities. These ‘*aldeamentos*’ were an integral part of Portugal’s broader counterinsurgency program designed to cut *Frente de Libertacão de Moçambique* (FRELIMO) off from its rural base of support. Although colonial authorities initially claimed that only 25,000 Africans would be displaced, by the end of 1973 the number had jumped to over 42,000. Conditions in the camps were rudimentary at best. A typical *aldeamento* contained

up to 1,500 residents. They lived in mud and wattle huts laid out in a grid enclosed by a barbed wire fence. The original planning documents called for each *aldeamento* to maintain a school, health clinic, water pumps, gristmills, warehouse for food reserves, social hall and football field. Except for a handful of model encampments, few of the ‘protected villages’ had all, or even most, of these amenities. Furthermore, the designated lands which the government had cleared were rocky and not very fertile and often far from the strategic hamlets. They stood in sharp contrast to the lands left behind. The arid conditions and absence of rain-fed lands dramatically reduced agricultural yields. So too did the colonial policies which limited each household to one small plot – typically less than a ha in size” (Isaacman & Sneddon, 2000).

In light of the restrictive government policies and the harsh environment, it is hardly surprising that the displaced communities experienced increased food shortages. There were also fewer opportunities to make up food deficits through hunting and fishing. In spite of government plans to protect the herds which roamed in the valley, large numbers of animals drowned when the Zambezi was impounded. Even in those areas where game survived, Portuguese military authorities prevented peasants from carrying rifles and severely restricted their movement (Isaacman & Sneddon, 2000).

Beilfuss, *et al.* (2002) provide similar descriptions of impacts. Fields being far from the strategic hamlets, it was not uncommon for peasants to depart before 6 a.m. in the morning and walk 5-7.8 km (2-3 miles) to get to their designated plots. To make matters worse, the lands that the government had cleared were rocky, hard to work and not very fertile (Beilfuss, *et al.*, 2002). Food insecurity and hunger were thus an integral part of the displacement process (Isaacman & Sneddon, 2000).

7.9.1.4 Waza Logone Floodplain, Cameroon

As with all floodplain ecosystems, the SEMRY rice scheme and especially its Maga Dam resulted in dramatic adverse long-term impacts on fish/fishermen,

agriculture/farmers, pasture production/pastoralists and their herds, migratory water birds and the wildlife of the 1,700 km² (170,000 ha) Waza National Park, especially elephants. From 1981 until the mid-1990s, this resulted in major environmental degradation and severe social upheaval, impacting up to 148,323 people in an area covering about 800,000 ha downstream of Lake Maga (Table 7.19):

Table 7.19: Economic losses from reduced annual flooding of the Waza-Logone Floodplain as a result of the SEMRY Scheme/Maga Dam

ECONOMIC SECTOR	TOTAL VALUE OF LOSSES FROM REDUCED FLOODING, (Euros/US\$)
Pasture Losses	1,402,500/1,654,950
Fisheries Losses	498,500/588,230
Agricultural Losses	340,000/401,200
Grass Losses (Thatch, Baskets)	304,900/359,782
Surface Water Supply Losses	19,800/23,364
NET COSTS/LOSSES	2,565,700/ 3,027,526

Source: Extracted from Loth (2004) with permission, International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU).

The total loss from the reduction in the annual inundation of floodplains as a result of the SEMRY scheme/Maga Dam of US\$ 3 million (Euros 2,565,700) to rural residents of the Waza Logone area (Loth, 2004) is 23% of the value of these resources prior to the implementation of this development scheme and its infrastructure.

7.9.1.5 Akosombo Dam/Volta Reservoir, Ghana

The majority of the 80,000 people who were relocated have never been provided with compensation, either in the form of money or in adequate land (IRN, 2000d).

7.9.1.6 Kiambere Dam, Tana River, Kenya

There was no relocation plan for the 7,000 people displaced by this World Bank funded dam. The displaced villagers went from poor to destitute. People were told that they had to leave with no alternatives. They lost their land, access to water and pasture for their cattle. Threatened by hunger, many found refuge in surrounding villages, vastly increasing pressures on the land. Reduced fallow periods for arable land and over-grazing of pastures created environmental stress. As a result, people in the communities that absorbed the displaced population also became poorer. A World Bank report states that families displaced by the Kiambere lost 82% of their money-equivalent income (which includes, for example, crops grown for household consumption) due to resettlement. The dam's electrical transmission lines pass over nearby villages, but not a single volt helps improve the lives of local people. "We are the cheap providers of electricity", says a farmer made landless by the dam (Horta, 1994).

7.9.1.7 Masinga Dam scheme, Tana River Kenya

"In 1981 after three years of construction, Masinga dam drowned an area of 115 km² (11,500 ha) of a river valley formerly a home to 6,000 people. These people became the displaced migrants to the surrounding rural areas and urban centers. They were monetarily compensated on basis of land lost and development as determined by official valuation and as required by law but with no systematic resettlement. That was the end of it. Public facilities like schools and health centers were reconstructed in the proximity of the old sites. Money given as compensation was not enough and the people became worse off. There has been no systematic monitoring of these displaced people and of their newfound settlements. A big lesson to manage future resettlements of displaced people was missed by this lack of monitoring" (Bobotti, 2000).

7.9.2 Dam Impacts Cultural and Spiritual Resources

The links of rural Africans to the lands of their ancestors, burial sites and sacred forests can never be replaced in resettlement zones, often causing psychological trauma and the breakdown in traditional society that may never be overcome by the displaced generation. These impacts are not much different to those created by the creation of parks and protected areas all over the continent that displace rural communities, where Westerners care more about wildlife than people.

7.9.2.1 Kariba Dam, Zimbabwe

“The Tonga people claim that Nyaminyami-Guardian of the River god, who is a direct descendant of their soothsayers and traditional healers, was angered by their removal from the dam inundation zone. This caused misfortunes such as the washing away of the foundation of the Kariba coffer dam during construction twice, in December 1955 and January 1958 as well as the death of 17 men trapped while working on the dam wall in February 1958” (Nhamo, 1999).

7.9.2.2 Cahora Bassa Dam, Mozambique

“The impoundment of the Zambezi River led to the flooding of a number of sacred shrines and burial sites. Many peasants believe that because they are no longer able to propitiate the dead they have alienated powerful Tawara and Tonga royal ancestor spirits (*Mhondoro*). Because they have angered the royal ancestors' spirits they no longer receive divine protection and therefore have suffered from divinely inspired droughts, famines, and diseases. They also could not rely on the protection from the *Mhondoro* during the brutal civil war in which thousands of peasants were killed or maimed. The oral data underscores the deep sense of cultural obliteration and vulnerability experienced by the dislocated communities” (Beilfuss, 2001).

7.9.3 Dam Impacts on Ethnic and Other Conflicts

The loss of dry season floodplain habitat by pastoralists from both flooding and irrigation can result in ethnic conflicts. Dams have also become political tools of ideological and liberation conflicts.

7.9.3.1 Senegal River

The Manantali Dam has not just affected local patterns of agriculture, but has led to violent conflict at a regional level as well. The crisis was caused by the dam itself, which had upset intricate water-sharing arrangements between Senegalese farmers, cattle herders and Moorish¹⁷⁷ traders (Sevunts, 2001). New landownership laws in Senegal and Mauritania, strongly promoted by the World Bank, IMF and French Fund for Assistance & Cooperation (FAC), enabled wealthy nationals and foreign companies to privatize land in the Senegal River Valley, on which traditional peasant owners had no formal rights (McCully, 2001).

When the dam project opened with new prospects of commercial agriculture, land legislation in Mauritania was rewritten in order to abrogate the land rights of the peasants who had lived along the Mauritanian riverbank for generations. The Arab-speaking elite Moors expropriated huge land areas (McCully, 2001). The Moors, who before had had little interest in agriculture, expropriated land in anticipation of making large profits from the development of medium and large-scale irrigation schemes with backing by the security forces. Thousands of black Mauritanian nationals as “foreigners” were kicked off their land (Colchester, 2000). This increased pressure on flood land outside of commercial control, and

¹⁷⁷ There are both white and black Moors

heightened ethnic tensions on the north bank of the Senegal River, where black farmers are perceived as Senegalese by Mauritanian herders (McCully, 2001).

Ethnic conflicts in the region preceded the arrival of the newcomers in the Senegal River Valley. Because these violent outbreaks, also referred to as *les événements*, coincided with the completion of the dams, many believe that there exists a direct link between the two events (Bossard, 1999a; Adams, 1999; Horowitz, *et al.*, 1990 *In:* Kloff & Pieterse, 2002). In 1989, just after completion of the two dams, the killing of sedentary Senegalese farmers by nomadic Mauritanian herdsmen in the river valley triggered the ethnic conflicts. In Senegal's capital, Dakar, 100 to 150 Moorish shopkeepers were killed and 10,000s of Mauritians fled from Senegal to Mauritania. Also in Mauritania's capital, Nouakchott, 100s of black people were killed. About 70,000 flood-recession farmers fled from the Mauritanian side of the river to Senegal. The military of the two countries engaged in armed skirmishes and nearly went to war over the conflict (Homer-Dixon, 1994; Bossard, 1999a; Ryder, 2001; Horowitz, *et al.*, 1990 *In:* Kloff & Pieterse, 2002).

The restructuring of the river most probably triggered the conflict. During the pre-dam period, the sequential use of the same lands by flood-recession farmers and herdsmen contributed to social cohesion and peace. This harmony was disrupted by rapidly developing irrigation schemes. Vast seasonal grazing lands in the river valley diminished and previously amicable relationships between ethnically distinct herdsmen and farmers deteriorated. Dikes were now surrounding the agricultural lands, blocking access by herdsmen to freshly harvested land. The killings that triggered *les événements* were probably the direct result of deteriorating relationships between farmers and herdsmen because of dam building and new irrigated perimeters (LeBillion, 2000 *In:* Celliers & Dietrich,

2000; Kloff & Pieterse, 2002).¹⁷⁸ The incident escalated and also spread to other regions after an accumulation of ethnic tensions that go further back in time (e.g., slavery) and that are not directly linked to the erection of the dams. A “burning belt” exists at the transition zone where nomadic desert life meets sedentary Sahelian life, a line of conflicts and wars from Mauritania to Sudan. These conflicts are quite similar to what happened or still could happen in the south of Mauritania (Kloff & Pieterse, 2002) (see Chapter 5, Section 5.11, CONFLICT LINKED TO OVERPOPULATION AND DESERTIFICATION – SCARCE RESOURCES). Much of this is believed to be due to factors such as decreasing fallow forcing farmers into traditional herding areas, loss of dry season floodplains from so-called “development” or “conservation”, creation of “open access” resources by central governments obliterating traditional management systems, dry season fodder on farms being used for fuel as forests disappear under an increasing wave of humanity, and old tensions from slave/master relationships. Slavery still exists in Mauritania, with white Moors having black slaves and in Senegal and Guinea-Conakry where blacks have black slaves and/or there are slave classes.

7.9.3.2 Cahora Bassa Dam, Mozambique

The Cahora Bassa Dam is linked to the struggles between *Frente de Libertacão de Moçambique* (FRELIMO) and the colonial state and later between the Mozambican government and South African supported *Resistëncia National Moçambicana* (RENAMO) rebels. The dam was initially conceived as a way for the colonial state to retain power over its territory as evidenced by the selective character of pre-dam investigations and subordination of social and environmental considerations by colonial planners intent on transforming the river regardless of

¹⁷⁸Note: Loss of traditional dry season grazing areas from reduced flooding forced pastoralists into farming areas and farmers displaced due to expropriation of their land would have been pushed into traditional grazing areas on the floodplains

the cost. Portuguese officials believed that the project would blunt FRELIMO guerrilla advances south of the strategic Zambezi River. They theorized that the 500 km (193 miles) long reservoir would impede access by FRELIMO forces to the heart of Mozambique from bases in Zambia and Malawi. They predicted that economic development stimulated by the dam would increase the size of the white settler community to 80,000, providing the first line of defense against the guerrillas. However, there was little evidence of settler interest in this malaria-infested region (Isaacman & Sneddon, 2000).

“The nationalist forces contended that Cahora Bassa was an integral part of a military and economic alliance between Portugal and South Africa designed to provide cheap energy to South Africa and perpetuate white rule in the region. For almost 7 years, FRELIMO waged an unsuccessful guerrilla campaign to block construction of Cahora Bassa which was completed in 1974” (Isaacman & Sneddon, 2000).

Independence intensified the conflict over Cahora Bassa between the new government and the Apartheid regime of South Africa. Concerned about FRELIMO’s historic ties to the African National Congress (ANC) and its non-racial socialist agenda, South African security forces began a military and economic campaign to destabilize the Mozambican government and destroy the country’s infrastructure with Cahora Bassa high on its list. Within six months of Mozambique’s independence in 1975 and take-over by FRELIMO, South African security forces working with Rhodesian counterparts created, trained and armed the *Resistência Nacional Moçambicana* (RENAMO) insurgents. Between 1976 and 1979, Mozambique suffered from more than 350 RENAMO and Rhodesian attacks. Although the dam itself was left unscathed, power lines were sabotaged on a regular basis for more than a decade (Isaacman & Sneddon, 2000).

The building of power stations to provide energy from the dam to the provincial capital Tete and nearby coal mines, plans to use the dam's water to irrigate more than 210,000 ha of choice farmlands in the valley, an agreement with India to set up an aluminum plant and plans to develop the commercial fishing, tourism and shipping industry on the reservoir never got underway due to South Africa's destabilization campaign. This ensured Pretoria's hegemony over the region in order to defend the political and economic interests of the Apartheid state and to insulate the African National Congress from linkages to sympathetic regional regimes (Isaacman & Sneddon, 2000).

The Mozambican government lacked the capacity to protect the 4,000 pylons cutting across 900 kilometers of remote country. As early as 1981, RENAMO dynamited pylons, which reduced electricity exports by 50%. It took six months to repair the lines. The cost of repairing the power lines of US\$ 500 million was almost three times the total value of Mozambican exports. The dam remained a white elephant, benefiting neither the national economy nor local economies of a struggling Mozambique (Isaacman & Sneddon, 2000).

Among the most vulnerable communities were the peasants displaced by the dam into strategic hamlets during the colonial period. Since their original homes were underwater, most had little alternative but to remain where they were. They were easy prey for RENAMO forces, which would go into homes and steal, order the people back into their homes and then set them on fire. This destroyed the social fabric of society among riverine communities, while paralyzing electricity production so that Mozambique derived no economic benefits whatsoever from the dam. From 1982 to 1997, Cahora Bassa's five massive generators stood idle (Isaacman & Sneddon, 2000).

7.9.4 Dam Impacts on Rural Electrification

The regrettable fact is that communities resettled by dams in Africa are rarely provided with electrical power by the dam they helped to create. This hydropower is destined for the wealthy in the big cities, irrigation and industry. The rural poor remain poor, or in many cases the displaced become poorer after this “development” takes place.

7.9.4.1 Senegal River

The inhabitants of 30 villages who were resettled downstream were allocated infertile and insufficient land to farm. They have no health centers and, although they are just a few kilometers from a dam that would be providing power for cities as far away as Nouakchott and Dakar, no electricity (Baxter, 2001).

7.9.4.2 Kariba Dam, Zimbabwe

An on-going irony that still frustrates many of those resettled is that electricity has formed no part of that program. This is explained by the cost of “stepping down” the supply to localities and the mainly widely dispersed nature of that resettlement. This is typical of most dam schemes in Africa and the developing world in general; the lives of the rural poor displaced by the dams are forever damaged, and links to electrical power destined for industry and urban centers escape them (WCD, 1999). By 1980, only 14% of Zimbabwe’s households, virtually none in rural areas, had access to electricity. A rural electrification program in the 1990s raised this to only 20% of the households. By then, the Kariba debt had been paid off to the World Bank. In addition, the majority of the people could not afford market-related electrical rates, which led the World Bank

and UNDP to push for a reforestation program.¹⁷⁹ Additional loans from the Bank to refurbish the Kariba and pressures to increase user fees, cutting off access to the majority of Zimbabweans, resulted in only 21% of Zimbabwe's population having electricity by 1996 (Bond & Manyanya, 2003).

7.9.4.3 Akosombo Dam/Volta Reservoir, Ghana

After nearly 40 years since the construction of the Akosombo Dam, almost all of the 52 resettlement communities that were created following the construction of the dam have yet to be supplied with electricity (Anane, 2001).

7.9.5 Dam Impacts on Downstream Irrigation

It is rare that irrigation schemes have reached the projected areas to be brought under production. Meanwhile, modification of the hydrological regimes has destroyed the traditional production systems that have fed man for centuries.

7.9.5.1 Senegal River

On the Senegal River, *the Société d'Aménagement et d'Exploitation des terres du Delta du Fleuve Sénégal* (SAED) was the state parastatal tasked with oversight of irrigation development in the Senegalese portion of the river. It had begun working with small-scale irrigation further north on *périmètres irrigués villageois'-PIV* (villager irrigated perimeters), which developed rapidly in the valley on the Senegalese side, increasing from 20 ha of irrigated land in 1974 to 13,000 ha in 1986 (Adams, 2000a) and 18,000 ha by 1988 at 700 sites (Boone,

¹⁷⁹ The history of forest plantations for firewood in Sub-Saharan Africa has not been positive (see Chapter 9, Section 9.8.9.3, Community-based natural forest management, *Gestion des Terroirs*, Burkina Faso).

2003). Yields were good. Had it not been for OMVS and the Senegalese government's plans of dam building and large-scale hydro-agricultural schemes, there might have been a small chance of PIV's success influencing river development plans, which might have enabled it better to weather the storms of the 1980s (Adams, 2000a). Boone (2003) explains that the PIV system was begun by peasant farmers in the Upper Valley, who used motor pumps to draw water from the river to land above the normal floodplain that was not controlled by the Soninké elite even though much of the floodplain was uncultivated. In 1976, the Senegalese government intervened to centralize control through SAED to develop rice-producing PIVs along the Upper and Middle River. The average household plot size in a PIV was 0.25 ha. In a power sharing relationship with central government, control over tenure was conceded to the ruling Fouta (Toucouleur) oligarchy in the Middle Valley and Soninké oligarchy in the Upper Valley. This was despite the fact that the 1964 National Domain Law over land tenure abolished "traditional landholders" to free peasant farmers from bondage by the rural elite. The rural elite took over control of the PIV's who benefited from credit and subsidized agricultural inputs. At the same time, they retained their traditional control over the floodplains. SAED was to deduct the cost of inputs after buying the rice harvest from farmers. However, most farmers consumed the produce themselves and/or sold the rice on local informal markets, SAED commercializing not more than 35% of the rice produced in the Upper and Middle Valley. Costs on the small plots within the PIV proved to be too high to make this commercially viable (Boone, 2003). The peasant families who had lived in the Senegal Valley for many decades could often not afford the inputs needed for irrigation farming (Bosshard, 1999). Between 1985 and 1990, SAED withdrew producer subsidies and PIVs were abandoned, leaving farmers even more vulnerable due to the disruption of flood recession agriculture by the Manantali Dam. This forced many farm families in the Middle Valley to depend on rotational migration to Dakar (living on remittances), commercial activities

and wage employment in the delta (Boone, 2003). Koopman (2004) goes into some length in discussing the loss of subsidies and supports to small scale irrigation farmers in the SRC beginning in 1985/6 with structural adjustment policies (SAPs) imposed on Senegal by the IMF.

SAED created an artificial peasantry in the delta that was socially heterogeneous. Between 1980 and 1987, as the Senegalese government gradually pulled back from managing large-scale rice estates in the delta, there was a speculative land rush by Dakar *fonctionnaires* (government workers), Mouride marabouts, merchants and SAED technicians eager to make a profit before salinization set in. From 1981-83, 40% of the requests for land grants around *Lac de Guiers* were made by persons residing outside of the rural council areas along with local “peasant aristocracy” such as village chiefs and presidents of cooperatives. Gradually, peasant associations made similar requests but appeared to have little political clout (Boone, 2003). In the Lower Valley (Delta), peasant farmers were sometimes forced into sharecropping arrangements with prosperous outsiders. With irrigation, the traditional sorghum crop was replaced by rice. Even for the richer farmers, however, irrigation proved to be more cumbersome and less productive than the project planners had expected. Since there has been no electric power (until 2001), expensive diesel for running the pumps (as well as seeds and pesticides) had to be purchased.

Due to organizational (little autonomy to farmers) technical (high saline groundwater tables) and operational problems such as farmers’ refusal to reimburse debts, delays in the delivery of inputs, poor maintenance of infrastructure problems, and high production costs, irrigation has never taken off as planned (Boone, 2003). Once Senegal, where most of the irrigated land is situated, underwent structural adjustment (SAP) beginning in 1985/6, the government could no longer afford to subsidize inputs or credits. The harvest

from the Senegal River Valley could not compete with rice imported at world market prices (Bosshard, 1999). At a cost of US\$ 25,000-40,000/ha, the construction of large-scale irrigation networks fed by the Manantali Reservoir proved to be more expensive than originally planned. Instead of 375,000 ha (255,000 ha – GFCC, 1980b), only about 100,000 ha have been brought under irrigation so far, with only about 2,000 ha/year added (Bosshard, 1999; World Bank, 2001; WEC, 2003). According to SAED's own statistics, the total area laid out for irrigation on the Senegalese bank of the river was 71,751 ha in 1995 and the area actually farmed that year, in all seasons, was 29,792 ha (Adams, 2000a). The World Bank (2001) estimates of the 100,000 ha in irrigation about 60,000 ha are farmed mostly in rice during the rainy season and 20,000 ha during the dry season. Koopman (2004) estimates that Senegal still imports 500-600,000 tons of rice a year, spending about 20% of its export earnings.

This problem was supported by similar conclusions about irrigation on the Senegal River examined as a means of assessing potential viability just south on the Gambia River. In the early 1980s, the rapid deterioration of infrastructure and irrigation equipment on the Senegal River resulted in a rate of abandonment about equal to the rate of expansion. Likewise, the cropping intensity for those perimeters in irrigation in 1983 was estimated at 122%, well below the projected rate of double cropping (200%), (University of Michigan, 1985a).

The inability of the Senegal Valley to compete with rice imported at world market prices was known by the GFCC consultant Walter Firestone, the agronomist on the Senegal River Basin (SRB) Environmental Assessment. However, his concerns were ignored. The environmental assessment was fairly accurate in its predictions on the loss of dry season forage, recession agriculture, and fish production, but it refused to take into account Firestone's concerns that 1) pumped irrigated rice was not economically viable and 2) rice could be imported

cheaper from Asia than grown by pumped irrigation in the Senegal River Valley, especially the delta (Firestone, *pers. comm.*¹⁸⁰; Rosenblum & Williamson, 1990). Unfortunately, it appears that GFCC was willing to sacrifice the people of the Senegal River Valley for what they hoped would be their next contract.

7.9.5.2 Gambia River

From the standpoint of pure rice production, a high dam with irrigation upstream of Kuntaur and improved swamp culture between Balingho and Kuntaur appeared to be the most advantageous development scenario (see Figure 7.3: Dams in the Gambia River Basin). This would require a regulated flow from a high dam of 3 m³/second maximum at Gouloumbou to keep the “1 part per thousand (ppt.)” salinity regime downstream of Kuntaur (km 250) once it reaches this point during the dry season, necessary to assure maximum rice production in the Lower Freshwater River Zone (Risley, 1986 *In:* Samba & DeGeorges, 1987a; 1987b & DeGeorges, 1987c). This was based on the Streamflow Synthesis and Reservoir Regulation (SSARR) model developed by the U.S. Army Corps of Engineers in the 1950s for the Columbia River Basin and applied to the Gambia River. Within this model, there was a watershed basin model, a flow routing model, a backwater model for estuary simulation and a reservoir operation model.

For single cropping, it was projected that a “salt free” zone less than 1 ppt. is needed from June/August until November and for double cropping until April/May (Euroconsult, 1986 *In:* Harding & DeGeorges, 1987). This would permit double cropped pumped irrigation of about 40,000 ha (Table 7.20) in the estuarine basin of The Gambia where approximately 80% of all irrigation, both tidal and pumped, would take place.

¹⁸⁰ Walter Firestone, Utah, USA, Agronomist, Senegal River Basin Environmental Assessment, funded by USAID and run by Gannett Fleming Corddry and Carpenter

Using the 2,300 calories/day/person (GFCC, 1980b) as the minimum intake for a healthy adult, the high dam options would meet the needs of 1,786,778 people/year (Table 7.20).¹⁸¹

Table 7.20: Projected rice yields in the estuary and Lower Freshwater River Zone with high dam options only (no Balingho Barrage), Gambia River

Location	Ha (1)	Yield (Metric Tons Rice) (2)	Protein Gain From Rice (gm) (3)	Carbohydrate Gain From Rice (Calories) (4)
Pumped Irrigation, Upstream Kuntaur	40,000	360,000	238×10^8	12.6×10^{11}
Improved Tidal Rice, Balingho-Kuntaur	49,000	56,350	37×10^8	2.0×10^{11}
Tidal Rice Upstream of Kuntaur	9,089	14,542	9.6×10^8	0.5×10^{11}
Tidal Rice Tendaba To Balingho (Mangrove Soils)	1,930 (5)	1,351	0.9×10^8	0.05×10^{11}
Total		432,243	286×10^8	15×10^{11}

(1) Samba & DeGeorges (1987a)
(2) Irrigation yield – 9 metric tons/ha/year (yield 8-10 metric tons/ha/year from double cropped land in irrigation; swamp culture: 1.6 tons/ha/year non-mangrove soils and 0.7 tons/ha/year mangrove soils use an average of 1.15 tons/ha/year) (Samba & DeGeorges, 1987a)
(3) 6.6 gm protein/100 gm of rice, HEW (1968 In: Samba & DeGeorges, 1987b)
(4) 350 calories/100 gm of rice, HEW (1968 In: Samba & DeGeorges, 1987b)
(5) University of Michigan (1985c)

Prepared by principal author

Irrigation potential in Senegal Oriental between the Gambian border and the Niokolo Koba Park was estimated at 4,900 ha. A high dam on the Gambia River in Guinea-Conakry would permit the additional irrigation in Senegal of 6,000 ha

¹⁸¹ See Chapter 5, Section 5.3.3, Food Security in Africa for latest figures used as standards below which a population is considered undernourished.

upstream of Kedougou above Niokolo Koba – thus an additional 10,999 ha of irrigated land (Samba & DeGeorges, 1987a).

From an agricultural standpoint, the proposed Kouya Dam received a slightly favorable rating because it permitted the irrigation of an additional 3,000 ha downstream in Guinea-Conakry. The Sambangalou and Medina Kouta Dam options would permanently inundate a portion or all of this area. However, the Sambangalou and Medina Kouta Dams on the Gambia River would retain much more water for hydropower¹⁸², irrigation, creation of artificial floods and estuarine maintenance. An additional dam, the Kogou Foulbe Dam on the Koulountou River within the Gambia River Basin, would allow the irrigation of another 12,000 ha for vegetables, maize, sorghum and rice (University of Michigan, 1985a).

Mini-Barrages in the mid-section and headwaters of the Gambia River Basin (Senegal and Guinea-Conakry) would permit incremental development over time. A minimum of 12,000 ha was identified in Guinea and in Senegal about 6,000 ha upstream of Kedougou and 4,900 ha of good to very good land was identified between the Gambian frontier and the Niokolo Koba Park that could be served by irrigation from mini-barrages.

7.9.5.3 Waza Logone Floodplain, Cameroon

Irrigated rice dates back to the post-WWII creation of the rural development company *Secteur Expérimental de Modernization du Nord* (SEMNORD), established to disseminate technologies on food crops. By 1954, the *Secteur Expérimental de Modernisation de Riziculture de Yagoua* (SEMRY) was

¹⁸² Average annual production in GWh/Year & Potential Power (Mw): Sambangalou/911-1,086 & 104-124, Kouya/334 & 30, Medina Kouta/137-269 & 14.4-67 and Kekreti/157 & 20 (Samba & DeGeorges, 1987a).

established and by 1965 was supervising 10,000 farmers cultivating 6,500 ha that produced 10,000 tons/year of paddy rice. It was determined that with an embankment to stop flooding into the rice fields, fertilizers, improved varieties and controlled irrigation by pumping, production could increase yields to 16,000 tons/yr; 40% of the national consumption. To avoid the high cost of production, the Maga Dam would be needed to store water and allow for gravity fed irrigation. Recommendations to SEMRY by the French consulting company SOGREAH to release water between September and November from the Vrick sluice gate to allow for artificial flooding were ignored. Once the dam was in place, there was no monitoring downstream on the ecological, hydrological or socio-economic impacts of the Maga Dam and the SEMRY scheme. A second phase, SEMRY II, built a 21 km embankment without appropriate studies, which would have shown that it was not needed to protect the rice perimeters, but would have dramatic adverse long-term impacts on the floodplain ecosystem, the Waza Park and the people living from the floodplain resources. There was no involvement of local communities in the planning process and when the communities requested that the Petit Guruma Channel be left open to allow for flooding, their advice was ignored (Loth, 2004).

“SEMRY I & II have been in financial difficulties since 1987. After the poor results of the 1st restructuration plan in 1991-1994, the Cameroon government launched a second restructuration plan as from the year 2000. This second plan will last till 2006 and SEMRY will benefit some 7 billions CFA (about Euro 10.8 million/US\$ 13.4 million) to renew its equipment (tractors, bulldozers, etc.), to cure irrigation canals, to reorganize and train farmers and to set up a functional credit system for input purchase and rice marketing. After 2006, the corporation is expected to operate on its own without any additional government assistance. If results are still poor, the company will be then closed.

For the moment, SEMRY I and II plough annually 50 to 60% of the total land available (11,600 ha). The 2 units have some 21,000 rice farmers. If you consider that each farmer takes care of seven

people (on average), you have about 150,000 people who depend on SEMRY rice production. Adding other people who are in charge of fertilizers trade, rice processing, wholesaling and retailing, you may end up with 200,000 people living on SEMRY rice production and marketing.

Total costs of production (for 0.5 ha) vary from 217,000 CFA (Euro 332/US\$ 415) to 270,000 CFA (Euro 412/US\$ 515) depending on the types and quantities of inputs used. Yields (per ha) vary from 25 to 40 bags of paddy rice. At production sites (Yagoua and Maga), clean rice costs about 250 to 300 CFA per kg (Euro 0.38-0.46/US\$ 0.48-0.58/kg), which is equivalent to the wholesale price of imported rice in Douala after customs clearance at the seaport. Due to high transportation cost from Maga-Yagoua to the major urban and consumption centers (Douala and Yaoundé which are 2,000 km away), the SEMRY rice becomes more expensive than the imported rice from Asia. Consequently, SEMRY rice is mostly sold in northern Cameroon, in Nigeria and in Tchad, which are close to the production sites" (Njomaha, *pers. comm.*).

According to Loth (2004), this amounted to 27-30 bags/ha averaging 2.3 tons of rice/ha, which, based on the above prices, would be valued at CFA 575,000-690,000/ha (Euro 879-1,055/US\$ 1,099-1,319/ha).

7.9.5.4 Nile River, Aswan High Dam

All but a small proportion of Egypt's agriculture is now dependent on regulation of the Nile River by the Aswan High Dam, completed in 1971. Government sources claimed in 1993 that 690,000 ha had been reclaimed from the desert since the high dam was built (McCully, 2001). FAO (1997) shows 852,000 ha reclaimed, but 210,000 ha of this reclaimed land going uncropped or a net of 624,000 ha in irrigation by 1992. FAO statistics show that actual irrigated land in Egypt in 1989 was 2.6 million ha, virtually unchanged from the area irrigated in 1961 when construction began on the dam (McCully, 2001). An estimated 100,000 ha of fertile topsoil has been mined to make bricks since the loss of the annual flood deposits of silt in the pre-High Aswan era, resulting in brick factories

buying up farmland to quarry. Urbanization has also resulted in more than 125,000 ha of formerly irrigated land being lost. Water logging and salinization from perennial irrigation are also a major issue (McCully, 2001).

“It should be noted that each time new land is reclaimed it is of a lower quality than the already cultivated land. The ‘best’ soils in Egypt cover an area of only about 1 million ha, while the ‘best’ plus ‘suitable’ soils cover an area of about 3.6 million ha. Adding the still more marginal land, the maximum area for agriculture could be 4.8 million ha. The remaining soils are unsuitable for agriculture. Taking an average water requirement of 13,000 m³/ha/year in the Nile Valley and Delta, about 4,420,000 ha could be irrigated using the 57.4 km³/year of Nile water” (FAO, 1997).

FAOSTAT (2004) indicates that 3,400,000 ha were in irrigation by 2002, Egypt apparently rapidly approaching its maximum potential.

However, the sum of the irrigation potential of all countries in the Nile Basin (Egypt, Ethiopia, Sudan, Uganda, Rwanda, Burundi, Tanzania, Eritrea, Kenya and the DRC)

“leads to a water deficit of over 26 km³/year, without considering possibilities of reusing water as indicated by Egypt and Sudan in their water balance, but after deducting the water ‘losses’ in the Sudd region” (FAO, 1997).

“This deficit corresponds to an area of almost 2.2 million ha for all countries, considering an average water requirement in the region of 12,000 m³/ha per year. This leads to an irrigation potential for the basin as a whole of 8 million ha instead of the nearly 10.2 million ha projected. However, even these 8 million ha are still a very optimistic estimate and should be considered as a maximum value, requiring very important storage works and optimum water use” (FAO, 1997).

Some argue that a potential water war looms in the future over its allocation for irrigation and the construction of dams for water storage in the Nile Basin (Klare,

2001). Turton (2001) describes similar hydropolitics and water security issues in Southern Africa (see Chapter 13, Section 13.11 AFRICA'S POTENTIAL WATER WARS).

7.9.5.5 Sennar and Roseires Dams, Sudan

Britain dammed the Nile at Sennar in the Sudan in 1925 for the Gezira Scheme, one of the world's largest cotton plantations. Almost 66% of modern large-scale irrigation in Sub-Saharan Africa is in Sudan. The Gezira scheme covers 840,000 ha, half the irrigated area in Sudan. Watered from the Sennar and Roseires Dams on the Blue Nile, it was first developed by the British in the 1920s, replacing traditional sorghum and nomadic herding with cotton. Cotton for export is the major crop grown even today. Even so, 33% of the children in Sudan suffer from chronic malnutrition (McCully, 2001).

"Irrigation potential in Sudan has been estimated at over 4.8 million ha, but this figure does not take into consideration the available water resources. There are plans to increase irrigation to about 2.8 million ha by the year 2000, almost all to be irrigated by Nile water" (FAO 1997).

Water management is a problem, as on the old established cotton schemes of Gezira-Managil where available water is 12% below crop requirements at crucial points in the growth cycle, while as much as 30% of the water delivered is not used by crops (FAO, 1997).

7.9.5.6 Bakolori Dam, Nigeria

Located on the Sokoto River, a tributary of the Niger River, the Bakolori Dam reduced the area of downstream rice production by 7,000 ha, and dry season crops by 5,000 ha. The dam altered the timing and extent of the flood. Dry season

water tables fell, requiring deeper wells and increased expenditures in time and money on watering crops. A 1980s survey showed that 75% of the dry season irrigators had given up farming, only the richer farmers surviving. Projected yields of groundnuts (peanuts) were only 69% of those predicted by the agricultural economists, rice 56% of the projected yield and cotton 17%. In 1971, the Nigerian Department of Agriculture estimated that Nigeria would have 320,000 ha under large-scale irrigation by 1982. By the end of 1980, less than 31,000 ha were under modern irrigation (McCully, 2001).

7.9.5.7 Kiambere Dam, Tana River, Kenya

By 1994, the project was reminiscent of a ghost town with abandoned water towers, overgrown irrigation canals and 20,000 desperate and hungry settlers. Downstream from the Kiambere Dam, the Bura irrigation project is an unmitigated disaster: the result of remarkably poor planning and institutionalized conflicts of interest. The Bura irrigation project, which the World Bank funded in the 1980s, was to irrigate about 14,170 ha (35,000 acres) to grow cotton and maize at an estimated cost of US\$ 98 million. The area actually irrigated peaked at just about 2,249 ha (6,000 acres) at a cost of US\$ 108 million, while social and environmental project components were canceled. In a country where per capita income is only about US\$ 350/year, the project spent an incredible US\$ 55,000 for every settler on the project site. Yet today, these settlers and their families suffer abject poverty, drought and famine. The project has also led to the destruction of evergreen floodplain forests, which were rich in plant and animal species (Horta, 1994; Horta, 1994 *In:* McCully, 2001). Only people with nowhere left to go remain on the project site. They are a community of about 20,000 former herders who sold their cattle, and farmers who left more fertile areas of the country for the promise of irrigated agricultural land. Much of the money for the Bura project was borrowed from the World Bank on non-concessional terms and

will have to be repaid at high interest rates. The Bura project will be a burden to the Kenyan economy for years to come and the debt will have to be repaid in hard currency, adding pressure to increase exports to generate foreign exchange. More of the country's resources will be diverted to activities such as flower production for European markets, while several million Kenyans risk becoming victims of drought and famine (Horta, 1994; Horta, 1994 *In: McCully, 2001*).

7.9.6 Impacts on Soil Linked to Agriculture

As discussed under Chapter 5, agriculture, soil salinization and acidification are major constraints in many irrigation and planned irrigation schemes in Africa. Over-population and resulting soil erosion in watersheds draining into reservoirs has also tended to shorten reservoir lifespans and modification of the hydrological regime by dams has resulted in the loss of fertile sediment being replaced each year on the downstream floodplains.

7.9.6.1 Senegal River

It is estimated that annually, an average 900,000 tons of sediment was deposited on the floodplain between Bakel and Saint Louis (Figure 7.4), 43% of the load as measured at Bakel for an average flood (GFCC, 1980b; 1980d).

The full establishment of irrigated agriculture is still confronted with many difficulties and economically questionable, with average production of rice not exceeding three tons/ha/year instead of the projected 12 tons/ha/year. Moreover, as the delta was a marine bay that gradually filled in with sediment over the last few 1000 years, there is an underlying hypersaline groundwater sheet at about 1 m below average sea level (ASL) stretching to over 200 km inland. Current irrigation practices, usually without drainage systems, seem unsustainable because

of increased soil salinity and large tracts that have already become irreparably damaged for agriculture. The rate of expansion of irrigated agriculture and total production is still far below set targets. For example, in Mauritania, of some 50,000 ha equipped for irrigation at great cost, only about 15,000 are cultivated annually. Some say that about 50% of the irrigation fields has been lost to soil salinization in the basin (Hammerlynck, *et al.*, 2000) (see Chapter 5, Section 5.12.1.3, Irrigation potential, Major Constraints to Irrigation as an Alternative to Production and Chapter 12, Section 12.4.4.1, Impacts of structural adjustment on peasant farmers along the Senegal River).

7.9.6.2 Gambia River

Much of this description is also true for the Senegal River Basin. At the time, little quantifiable data existed as to the degree of soil erosion in the Gambia River Basin. It was believed that the following activities led to wind and rain erosion in the basin (DeGeorges, 1987d):

- **Burning** to clear land for agriculture, for precautionary fires to protect villages from big fires and predators, to improve visibility for hunting, to improve dry season grazing.
- **Over-grazing**
- **Deforestation**, see Chapter 5, Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal Linked to Charcoal Making, Over-Population and Declining Fallow Periods.
- **Farming steep slopes**, as fallow periods disappear and people are forced onto more marginal lands.
- **Clearing land of all soil cover** right before the rains for agricultural purposes.

Indirect estimates of erosion through sedimentation in the Gambia River Basin indicate 50-100 metric tons of sediment/km²/year (Olivery, 1983 *In: DeGeorges, 1987d*). Though considered low compared to more intensively cultivated areas of Africa, the soils of the Gambia River Basin are thin and thus erosion might be considered high; this needs further study. Increased deforestation and farming on marginal land associated with increasing human populations risk to increase soil erosion and the life span of proposed dams, as well as the productivity of the lands.

7.9.6.3 Nile River, Aswan High Dam

Before the construction of the Aswan High Dam, the Nile River carried an average of 124 million tons of sediment to the sea each year, depositing an additional 9.5 million tons on the floodplain and delta as an aid to traditional recession agriculture. Today, 98% of the Nile's silt drops to the bottom of the Nasser Reservoir. As a result of the Aswan High Dam acting as a major silt trap, the loss of silt, low in nutrients, but rich in silica, aluminum, iron and other trace elements, has had a serious effect on Egyptian agriculture, requiring large inputs of artificial fertilizers and a long-term decline in soil trace elements. Each year the silt also added 1 mm to the depth of the soil on the floodplains. This soil loss is particularly significant in the delta, which constitutes 67% of Egypt's cropland, the delta virtually disappearing, and losing 5-8 m/year. Soil exhaustion and salinization linked to the loss of silt, annual flushing and expansion of perennial agriculture, the long-term sea rise in the Mediterranean from global warming and the subsidence of the Egyptian coast add to this crisis (McCully, 2001).

7.9.7 Impacts on Floodplain Irrigation “Recession Agriculture”

Unless there are artificial flood releases from high dams, which in Africa is rare, traditional production systems associated with floodplains (e.g., recession agriculture, dry season pasture for wildlife and livestock and fisheries) are lost both due to a lack of flooding and due to conversion of habitat to irrigated perimeters; often the rural producer loses control of his/her land to an outside elite which moves in for a profit.

7.9.7.1 Senegal River

Seck (1991 *In: Boone, 2003*) estimates that for an average flood only 100,000 ha was traditionally cultivated on both sides of the river.

“Traditionally, the parts of the floodplain that had been under water for 45 days [Note: Bossard (1999) estimated pre-dam floods lasting from a couple of weeks up to four months, Koopman (2004) estimated six to eight weeks, while GFCC (1980b; 1980d) calculated land available for recession agriculture as any area inundated for 30 days or more] at least could be cultivated without any other intervention but planting seeds when the waters receded. Fertility was maintained by the clays and silts that sedimented from the floodwater, and by the dung left by animals that had grazed the floodplains during the dry season. Though the productivity per ha rarely exceeded 1 ton per year, the low labor and capital input and the hundreds of years of experience transmitted through the generations made this exploitation system rather performant, especially for the rural poor. Even now, sedentary agriculturists that have converted to rice farming continue to practice recession agriculture as an extra source of food security whenever the floods released from Manantali allow. A major problem is that the land available for this sustainable type of agriculture is insufficient, not only because of population growth and reduction of flood height but also through the change in land ownership structure. Many of the best soils have been converted to large-scale irrigation plots and concomitantly their ownership has

‘moved out of the valley’ (that is taken over by rich outsiders who can afford inputs). This has in some cases led to serious social conflict. A positive development has been the establishment of small-scale market gardening along the new permanent freshwater courses” (Hamerlynck, *et al.*, 2000).

Boone (2003) goes into some detail on the disenfranchisement of local farmers by local and outside elites as irrigation began taking over (see Section 7.10.5.1, Senegal River). Artificial flooding is discussed in Section 7.11.7.1, Senegal River.

7.9.7.2 Gambia River

Structural scenarios, which included the Balingho Anti-Salinity Barrage, would result in loss of existing/potential tidal swamp rice habitat from inundation by the Balingho Reservoir and/or modification of tidal action:

- 1) Loss of existing tidal swamp culture in Balingho inundation zone, major adverse, long-term.** This was estimated to be 12,756 ha +/- 2,078 (Harding & DeGeorges, 1987). At the time, this was estimated to be 49% of the current rice land in the Gambia (University of Michigan, 1985a). In an earlier estimate, 9,000 ha were identified as existing swamp culture (Cueto & Webb, 1987 *In: Samba & DeGeorges, 1987a*). University of Michigan (1985c) estimated 11,000 ha.
- 2) Loss of potential swamp culture in the Balingho inundation zone, major adverse, long-term.** It was predicted that 40,000 ha of potential improved swamp would be permanently lost within the inundation zone of the Balingho Barrage (Cueto & Webb, 1987 *In: Samba & DeGeorges, 1987a*).
- 3) Loss of existing rice production upstream of Kuntaur (upstream of inundation zone) from loss of tidal action.** An estimated 5,600 ha of

tidal swamp culture habitat was projected to be lost (Cueto & Webb, 1987
In: Samba & DeGeorges 1987a)

- 4) Loss of potential rice production upstream of Kuntaur from loss of tidal action.** An additional potential of 9,089 ha of tidal swamp agricultural upstream of Kuntaur would be lost due to elimination of tidal action (Cueto & Webb, 1987 in Samba & DeGeorges, 1987a).
- 5) Loss of actual and potential tidal rice culture below Balingho.** The University of Michigan (1985c) study estimated at the time that there were 1,930 ha in swamp culture. It is believed that because of the salinity gradient, there would be marginal room for expansion.
- 6) Projected loss of dry season grazing area.** It was projected that 40,550 ha of dry season grazing area would be permanently lost on the North Bank, Lower River and McCarthy Island divisions as a result of inundation by the Balingho Barrage's reservoir (Carney, 1984 *In: Samba & DeGeorges, 1987b*).

Another important factor that must be brought out here is that when agricultural schemes go from subsistence, such as swamp culture undertaken by the 43,000 women, to intensive cash oriented agricultural schemes as was being planned, men tend to displace women in the work force (Samba & DeGeorges, 1987b). Similarly, Turner (2004, *In: Fabricius, Koch, Magome & Turner, 2004*) indicates that women tend to be most heavily involved in and dependent on small-scale subsistence oriented wild resource collection but tend to be displaced by men when this resource collection becomes commercialized (e.g., timber, wildlife, etc.). A classical example is the Jahaly-Pacharr irrigation scheme in the Gambia (Pottier, 2005 *In: Acts, 2005*) that would likely see further disenfranchisement of women as commercial irrigation comes on line.

7.9.7.3 Zambezi River Floodplains

Kariba Dam, Zambezi River

As described under the section on displacement of people, inundation by the reservoir resulted in the Ba-Tonga losing the floodplains necessary for cultivation of giant sorghum (see Section 7.9.1.3, Zambezi River).

Cahora Bassa Dam, Upper Catchment Mozambique, Zambezi River

In the “upper catchment near Cahora Bassa Reservoir, agricultural production was also closely tied to and dependent on the Zambezi River. Waters from the flooding river inundated the banks of the Zambezi during the rainy season, beginning in December and ending in March. When the water receded, they left a rich deposit of nutrients along the shoreline. In lowland areas, this spillover extended, depending on the locale, over a several kilometer stretch of land. Tawara and Tonga peasants through this region stressed that these rich dark makande soils of the floodplains were the most desirable agricultural sites in the region. They distinguished the floodplain makande soils from the more common sandy, rocky ntchenga soils, which did not retain water and were difficult to farm. Given the low and irregular rainfall in the Tete region (600 mm per year), access to the river-fed makande soils was critical to insure household food security. From the interviews, it became clear that the utilization of river-fed fields was an integral part of a complex and highly adaptive indigenous agronomic system, which dated back over several centuries. Drawing on rich repertoire of farming practices, born out of years of trial and error and detailed micro-ecological knowledge” (Beilfuss, *et al.*, 2002).

These areas were lost with the inundation of these floodplains by the reservoir.

Cahora Bassa and Kariba Dams, Zambezi Delta, Mozambique

The Lower Zambezi Valley supports more than one million people who directly depend on the Zambezi River for part of their livelihoods (Davis, *pers comm.*; Beilfuss, *et al.*, 2002). Traditionally more than 350,000 people depended on the

floodplains of the Zambezi Delta, practicing recession agriculture, hunting, fishing, etc. (Beilfuss, *et al.*, 2002). Thus, the lives of the people and the food they depended on were regulated by the annual floods of the Zambezi, as is the case over much of Africa's floodplain ecosystems. A variety of floodplain crops were grown, including corn, vegetables, sweet potatoes and beans with at least two harvests per year, a main harvest - known locally as *tchaca* - during the wet season between October and January and a second harvest - called *mulope* - during the dry season between April and June (Beilfuss, *et al.*, 2002).

Traditionally, high ground was farmed in the wet season and the floodplain in the dry season. Flood recession agriculture provided a safety net during drought years when upland crops failed (UTIP, 2002). The Cahora Bassa (Isaacman & Sneddon, 2000), Kariba and Kafue Dams turned the Lower Zambezi into a regulated river; the principle function of the Cahora Bassa being to provide cheap energy to South Africa (Isaacman & Sneddon, 2000).

By 1975, with the operation of the electrical turbines, the transformation of the river's annual cycle was complete from a punctuated, season-specific flow regime with a regular pattern of flood timing, magnitude and duration to one with irregular floods, relatively constant flow rates and unpredictable high flow durations – without regard for the agricultural cycle (Isaacman & Sneddon, 2000). For instance, occasional out-of-season drawdown releases from Cahora Bassa have wiped out crops along the length of the main stem of the Zambezi River and along the Catarina, Chinde, and Mucelo distributaries (Beilfuss & dos Santos, 2001). From the Shire confluence down to the Zambezi Delta at Luabo, because of the irregular floods, farmers are forced to cultivate their crops and gardens on rainfed uplands far from the river during the wet season. Farms in the lower floodplain and on the islands are periodically washed away by unexpected floods. At Mopeia, much of the farming land formerly used for a double crop of rice has been abandoned, the floodplain being used only once a year for sweet potatoes. In

several areas in the lower reaches of the Zambezi, floodplain farmers have resettled close to the main stem Zambezi to cultivate crops in the narrow band of alluvium that is inundated each year, believing the Cahora Bassa Dam can control large floods (Beilfuss, *et al.*, 2002 & UTIP, 2002). This has led to a significant increase in flood risk and flood damage when large floods occur, such as the 1978 flood, the 2000/2001 Zambezi River flood that killed 700 and displaced 500,000 (NASA, 2008) and the 2007 flood that killed 45 people and left 285,000 homeless from torrential rain and hurricanes (Mangwiyo, 2008). In 2008, early rains, primarily in the Zambezi Basin forced releases from Cahora Bassa dam, flooding the delta and resulting in massive loss of crop production for a second year, and displacement of about 62,000 people as of January 13th (NASA, 2008) and 76,000 by January 22nd (Robertson, 2008). Even floods that are moderate by historical standards, such as the 1989 and 1997 floods, resulted in extensive flood damage because of new settlement patterns. The loss of recession agriculture, along with the loss of the floodplain fishery, has resulted in chronic food insecurity for tens of 1000s of people living in the riparian districts of Morrumbala, Mopeia, Mutarara, Caia and Chinde (UTIP, 2002).

The only agricultural area in the alluvial plains that appears immune from irregular flow is the high rainfall area of the Zambezi Delta coastline, which receives about 1200-1400 mm rainfall per annum, discharge from the Zambezi River and perennial runoff from streams rising on the Morrumbala Plateau (north bank) and Cheringoma Plateau (south bank). The reduction of large flooding events may be contributing to soil salinization in this region (Beilfuss, *et al.*, 2002).

7.9.7.4 Waza Logone Floodplain, Cameroon

This area receives between 500-600 mm of rainfall annually, with crop production failing one in three years, which results in chronic food insecurity, in turn

exasperated by the diverse loss of food as the result of reduced flooding from the SEMRY scheme. A census shows that 148,323 rural residents (24,720 households) in 555 villages live in the Waza Logone region of which 25% have agriculture as their main activity and 34% as a secondary activity. Traditionally, planting occurred as follows (Loth, 2004):

- June, fields ploughed and sowed with red and white millet, vegetables and cotton;
- Red millet harvested in October;
- Nursery plants of dry season millet transplanted end of September – harvested in February; and
- Rice sown in July and nursery plants transplanted in August – first rainfed, then irrigated with floodwater – harvested in February.

The estimated losses to agriculture from the Maga Dam/SEMRY project are estimated at Euros 340,000/year (US\$ 401,200/year) (Table 7.19), mainly from decreased flooding and the lost potential for floating sorghum and rice and recession sorghum (Loth, 2004). Additionally, the total loss of produce is estimated at 50% annually from pests such as the red-billed queleas (*Quelea quelea*), insects and wildlife for those living near the Waza Park, and at times excessive flooding.

7.9.7.5 Kainji Dam, Nigeria

Floodplain yam production fell by 100,000 tons after dam completion in 1968 (McCully, 2001).

7.9.7.6 Nile River, Aswan High Dam

See Section 7.9.6.3, Nile River, Aswan High Dam.

7.9.7.7 Pongola River, South Africa

“In the late 1960s the Pongolapoort dam was constructed on the Phongolo River in north-east South Africa near its borders with Swaziland and Mozambique. The reservoir was filled in 1970 with a view to irrigating 40,000 hectares of agricultural land for white settlers, with no provision for hydropower generation. No assessments were undertaken of impacts of the impoundment on the floodplain where 70,000 Tembe-Thonga people were dependent on recession agriculture, fishing and other wetland resources nor on the biodiversity of the Ndumu game reserve” (Acreman, *et al.*, 2000).

7.9.8 Impacts on Nutrition

The bottom line is that development schemes are supposed to improve peoples' lives by eliminating poverty and improving nutrition and health. Improved nutrition is a very good indicator of how successful a development program has been in achieving or not achieving its goals. The record speaks for itself.

7.9.8.1 Senegal River

The projection of impacts of dams on nutrition in the following tables assumes that the rate of conversion of land to irrigation continues as projected and that an artificial flood will continue for 15 years. The importance of traditional production systems, (1) recession/*waalo* farming, (2) *dieri/jeeri* farming (rainfed), (3) herding and (4) freshwater/saltwater fisheries, in 1980 prior to dam construction cannot be denied, as these make up 75% of the caloric intake and 92% of the protein intake within the Senegal River Basin (Table 7.21).

Table 7.21: Summary of projected, available amounts of nutrition from agricultural products on an annual basis with implementation of the proposed plans of development in the Senegal River Basin

Table 7.21 Cont.: Summary of projected, available amounts of nutrition from agricultural products on an annual basis with implementation of the proposed plans of development in the Senegal River Basin

	1980				2000				2028			
Sources	Calories	% of Total	x 10 ⁷	Total Grams	Calories	% of Total	x 10 ⁷	Total Grams	Calories	% of Total	x 10 ⁷	Total Grams
Saltwater Fisheries	1,400	1	240	4	5,320	2	912	13	14,000	3	2,400	14
Total	96,738	100	5,808	100	254,834	100	10,583	100	465,908	100	17,239	100

- 6) Saltwater equates to marine fisheries whose importation into the Senegal River Basin would makeup for the loss of riverine fisheries from dams and development. With upwelling phenomenon, large ocean fishery of species whose lifecycles are independent of estuaries.

Source: Extracted from GFCC (1980b) funded by USAID, public domain.

- 7) Assume 100,000 ha rainfed Dieri farming for sorghum and millet in 1980, half under cultivation in 2000 and used primarily for agriculture by 2028.
- 8) In 1980 about 100,000 ha/yr of 374,000 ha flooded 30 days or more placed in recession agriculture & in 2000 about 100,000 ha/yr of 178,000 ha/yr artificially flooded for 30 days or more placed in recession agriculture primarily in corn, niebe (beans) and sorghum until 2002 when artificial flood (required flow at Bakel of 2,500 m³/sec from August 15 – September 15) discontinued. By 2028 on average of 64,000 ha flooded for 30 days or more only 47,000 ha in recession agriculture due to agricultural development, flow control & loss of artificial flooding with flooding virtually disappearing in valley between Bakel and Dagana during smaller than average floods.
- 9) In 1980 estimated 2,066,000 cattle equivalents by adding goat/sheep numbers (2,524,000) divided by 7 and adding to cattle numbers. Decrease in cattle units to 2,057,000 and 2,042,000 but carcass weight increases under modern agriculture (28,250-38,250 ha in forage of 255,000 ha in pumped irrigation) from 120 kg to 190 kg/carcass. Also includes pig and fowl production.
- 10) In 1980, 12,000 ha of pumped irrigation 100% in rice (64,400 metric tons) but by 2028 with 255,000 ha in production while rice still dominants (406,200 metric tons) metric tons from other crops also includes wheat (132,600), corn (222,300), sorghum (315,000), beans (3,800 dry weight) and vegetable fruit (256,800). In 2000, 117,000 ha, same crops as 2028 at about 50% the yield in metric tons.

Source: Extracted from GFCC (1980d) funded by USAID, public domain By principal author who helped prepare original table

Actual consumption of cattle for cultural reasons may have been much less than shown, but was projected to increase in importance as the basin entered into a cash economy. One could also project that if traditional food production systems were wiped out – as has happened – without replacing them with production from

the planned irrigation, there could be an increase in livestock consumption as people would enter into a survival mode or sell livestock to obtain money to buy food that could no longer be produced. Of course, wiping out the dry season forage habitat from reduced flooding without replacing it with high value forage as projected from the irrigated perimeters could also have resulted in a drastic decline in livestock as a nutritional or income source.

On the other hand, if in fact livestock were not consumed to the degree applied in the analysis, then the other traditional systems would become that much more nutritionally important if irrigation would not take off.

Even with the projected increase in irrigation offsetting the loss of these traditional production systems, caloric deficiencies in the Senegal River Basin were projected to become a problem by 2028 during peak development of the irrigated perimeters (Table 7.22). Due to the exponentially expanding human population, food demand by 2028 would exceed the linear growth of agricultural production as projected. It was projected that the quality of the diet as measured by protein intake would remain adequate while deficiencies in the quantity of food consumed, as measured by caloric intake, would return to deficit levels. This deficiency was evident even without stratification of the populace by age groups, even though caloric deficiencies are more common in younger age groups.

It was projected that caloric deficiencies (undernourishment) may ultimately result in protein malnourishment even though adequate supplies of protein might be consumed. This results from proteins being used as an energy source in place of much needed calories. Proteins are lost as building blocks for growth, repair and preservation of the body and bodily functions.

Table 7.22: Summary of projected, available caloric and protein intakes for the population of the Senegal River Basin on an annual basis with implementation of the proposed plans for development

	1980	2000	2028
Population	1,649,500	2,901,100	6,274,500
<u>Calories</u>			
Total Available (x10 ⁷)	96,738	254,834	465,908
Total Desirable ¹ (x10 ⁷)	138,476	243,547	526,744
Deficit (-)/Gain (+) (x10 ⁷)	-41,738	+11,287	-60,836
Daily Per Capita Availability	1,607	>/= 2,300	2,034
<u>Protein (Grams)</u>			
Total Available (x10 ⁷)	5,808	10,583	17,239
Total Desirable ² (x10 ⁷)	3,974	6,989	15,115
Deficit (-)/Gain (+) (x10 ⁷)	+1,834	+3,594	+2,124
Daily Per Capita Availability	>/= 66	>/= 66	>/= 66

- 1) Assume minimum value of 2,300 calories per capita per day for projected basin populations
- 2) Assume average value of 66 grams of protein per capita per day for projected basin populations.
- 3) Human population growth rate projected at 2.3% per annum
- 4) By 2028, rice and wheat would have to be imported into the basin
- 5) Key assumptions are that a) programmed levels of agriculture proceed at scheduled rate of implementation, b) the annual crop yields assume proper management of irrigated perimeters, c) prior to export out of the basin, local dietary needs would be met first.

Source: Produced by principal author for GFCC (1980b), funded by USAID, public domain

What has actually happened is that the traditional systems have been virtually wiped out and that irrigation has failed to come anywhere near the projected 255,000-375,000 ha. The proposed artificial flood as of 1999 has not taken place to the degree planned, with the result that yields from recession agriculture and riverine/estuarine floodplain fisheries are minimal. So far only about only about 100,000 ha have been brought under irrigation, with only about 2,000 ha being added per year (Bosshard, 1999; World Bank, 2001; WEC, 2003). Some say that about 50% of the irrigation fields have been lost to soil salinization in the basin

(GEF, 2002). The dams and dikes have reduced traditional grazing lands from 80,000 ha to 4,000 ha in the valley (GEF, 2002).

Even if artificial flooding could bring an average of 50,000 ha/year into recession agriculture production (see Section 7.10.7.1, Senegal River) that was the GFCC 2028 scenario (see Table 7.21, footnote 8), without going into a detailed analysis, it can be seen that there would be an immediate food crisis both with regard to caloric and protein intake, both falling into deficit categories. It must be presumed that the deficit in the near future can only be mitigated by:

- 1) Out migration
- 2) Food aid and/or
- 3) Remittances sent from family living in Dakar or overseas.

Out migration from the Senegal River Basin by males in search of employment has been a factor since the 1940s, peaking during the drought of the 1970s because of a failing economy and desertification. In 1980, over 90% of the foreign labor in France from the Sahel came out of the Senegal River Basin. It was projected that without the OMVS development scheme (or implying if it failed) 100,000 migrants/year would leave the basin by 1980 and 850,000 migrants/year by 2028 (GFCC, 1980b). In 2006, it is assumed the figure of out migration falls between these two figures. In fact, since the dams, the net result of declining food production from the slow pace of irrigation expansion and the rarity of useful floods has resulted in out-migration by young males, households depending upon remittances to buy food they no longer produce, an increase in malnutrition especially among women, children and ethnic minorities and increased vulnerability to respiratory and parasitic diseases from declining nutrition (Finger & Teodorou, 2003). One must wonder what percentage this has

contributed to Senegalese fleeing to the Canary Islands via unseaworthy boats, many dieing along the way, in hope of reaching France and a better life?

The GFCC environmental assessment (1980b) went on to say that if the population continued to grow as expected to over 6 million people in the river basin, and yet agricultural production remained at 1980 levels, the daily per capita caloric intake rate could fall to as low as 424 calories/person/day and protein as low as 26 grams/person/day. This would mean severe under- and malnutrition of the basin's inhabitants and an increased susceptibility to disease. From the failed irrigation schemes and the destruction of traditional production systems, one would have to assume that by the late 1980s or at the latest early 1990s a nutritional crisis would exist unless there was an increased out-migration, mitigation was successful and/or remittances from family working elsewhere helped provide purchasing power to buy imported foods.

The switch from local grain to rice production and the reduction of fish consumption have also had negative impacts on the diet of the local population. A 1994 study of villagers in Senegal and Mauritania financed by USAID determined that their health has deteriorated. The study is convinced that before the construction of the dams, the production of traditional food recession crops provided a more varied and healthier diet. The local population insists that it is because of their present diet, made up primarily of rice, that they are weaker and have more health problems than before. Rice consumption is not only a consequence of the new dam, but also seems to have become a cultural preference in the Senegal Valley (Bosshard, 1999). McCully (2001) states that rice consumption doubled in eight years since the dams were finished, but that the nutritional status of the people in the valley declined since the variety in their diet (millet, sorghum, maize, black-eyed peas) had fallen between 30 and 90%. Consumption of fish, meat and dairy products had also fallen.

7.9.8.2 Gambia River

The following compares a high dam scenario only versus a high dam linked to the Balingho Anti-Salinity Barrage and the impacts this will have on rice production and nutrition in the Gambian portion of the basin where most of the rice is currently produced and would be produced if dams were built. While a high dam only option would allow the development of both irrigation and improved tidal swamp culture, any structural alternative with the Balingho Anti-Salinity Barrage would be catastrophic to the local people (Table 7.23).

Assuming that Balingho was hooked into a high dam that permitted irrigation that produced 360,000 metric tons of rice (Table 7.23) in the Lower River, the net production from a two dam scenario would be 287,757¹⁸³ tons of rice that could assure 2,300 calories/day as a minimal requirement for a healthy adult (GFCC, 1980b) theoretically to +1,191,185 people compared to 432,243 metric tons of rice from a high dam scenario only (see Table 7.20) that could assure minimum daily caloric requirements to +1,786,778 people/year. Thus, theoretically, the high dam only scenario could feed an additional 595,593 people in the estuary and Lower River where the majority of the people reside. This has not accounted for the additional irrigation in the Senegal and Guinean portions of the basin, which will vary slightly with each dam. The purpose here is to demonstrate that regardless of the high dam, in the Gambian portion of the basin, any high dam with the Balingho Anti-Salinity Barrage will result in significantly less food being produced than a high dam only scenario. Thus, other than for construction profits for dam building companies, kickbacks for politicians and a bridge to control the secessionist movement in the Casamance (see Section 7.8.5, Politics of Proposed

¹⁸³ 360,000 tons from irrigation - 72,243 tons lost from the Balingho Barrage = 287,757

Dams on the Gambia River), it is impossible to understand how anyone could opt for the Balingho Barrage as part of any dam scenario! Learning from the Senegal experience, if irrigation development does not attain projected goals and traditional swamp culture is wiped out, the high dam scenario at least allows residents to continue producing via traditional systems.

Table 7.23: Projected loss of annual rice yield potential in the estuary and Lower Freshwater River Zone with Balingho Barrage

Location	Ha (1)	Yield (Metric Tons Rice) (2)	Protein Gain From Rice (gm) (3)	Carbohydrate Gain From Rice (Calories) (4)
Pumped Irrigation Upstream of Kauntaur	+40,000	+360,000	+238 x 10 ⁸	+12.6 x 10 ¹¹
Improved Tidal Rice Balingho to Kuntaur	-49,000	-56,350	-37 x 10 ⁸	-2.0 x 10 ¹¹
Tidal Rice Upstream of Kuntaur	-9,089	-14,542	-9.6x 10 ⁸	-0.5 x 10 ¹¹
Tidal Rice Tendaba to Balingho (Mangrove Soils)	-1,930(5)	<u>-1,351</u>	<u>-0.9 x 10⁸</u>	<u>-0.05x10¹¹</u>
Total Loss of Rice Production		-72,243	-47.5 x 10 ⁸	-2.6 x 10 ¹¹
Net Gain in Rice		+287,757	+191 x 10 ⁸	+10 x 10 ¹¹

(1) Samba & DeGeorges (1987a)

(2) Pumped Irrigation 9 tons/ha/ year. Swamp Culture: 1.6 tons/ha/year non-mangrove soils and 0.7 tons/ha/year mangrove soils (Use average of 1.15 tons/ha/year below Kuntaur since one cannot separate mangrove from non-mangrove and 1.6 tons/ha/year upstream of Kuntaur where mangroves do not exist) (Samba & DeGeorges, 1987a)

(3) 6.6 grams (gm) protein/100 gm of rice, HEW (1968 In: Samba & DeGeorges, 1987b)

(4) 350 calories/100 gm of rice, HEW (1968 In: Samba & DeGeorges, 1987b)

(5) University of Michigan (1985c)

Prepared by principal author

The Balingho would have to be linked to a high dam as noted.

Add in what would appear to be a significant loss of fish (Section 7.8.7.2, Gambia River) and dry season grazing for livestock (Section 7.8.9.2, Gambia River) as a result of the Balingho Anti-Salinity Barrage and one is faced with a food crisis, which unlike a drought, would be permanent in nature. Also, as noted under the Senegal River case study, a carbohydrate deficiency can result in a protein deficiency from forcing the body in trying to survive to draw on muscle tissue as a source of energy.

7.9.8.3 Cahora Bassa Dam, Mozambique, Zambezi River

Anderson, *et al.*, (1990) believe one of the reasons poaching is up in the Marromeu Swamps is due to a decline in other sources of food, which artificial floods would bring back in the form of freshwater fish production, recession agriculture, dry season grazing and even shrimp production, helping people find a more diverse source of protein which could take the pressures off the wildlife within this game reserve. In addition, increased flooding would likely make access into the Marromeu Complex by poachers during the wet season more difficult, while operational trophy hunting camps during the dry season would serve as a second deterrent. A third aspect would be to get local communities more actively involved in co-management of the area, even allowing traditional hunting and fishing within the area but in a controlled manner.

Estimates made within Mozambique cost the lost power output from Cahora Bassa to restore a mimicked natural flood regime at US\$ 20 to US\$ 30 million/year or some 10% to 15% of the value of its power generation. Early estimates put the gain in agricultural, fishing and aquaculture, wildlife and tourism in the delta at higher than that loss of power (WCD, 1999) (see Section 7.10.7.3, Kariba and Cahora Bassa Dams, Zambezi River).

7.9.9 Impacts on Health

Reservoir areas become foci of disease during and after construction. Also, unless people are healthier and better fed as a result of dam construction, in a weakened state they become more susceptible to succumbing to disease because of weakened immune systems.

7.9.9.1 Senegal River

When the Diama and Manantali Dams were filled, an epidemic of Rift Valley Fever (mosquito vectors) occurred, schistosomiasis (aquatic snail vector) prevalence rates reached record levels and riverside inhabitants experienced diarrheal disease, malnutrition and malaria, despite experiences with transmission of these diseases from earlier African dams (WCD, 2000). The Rift Valley fever outbreak began in October 1987, appearing for the first time in West Africa, killing 300 people in Rosso, Mauritania. The outbreak appeared at a time when mosquitoes were unusually abundant due to the recent filling of the Diama Dam and the subsequent increase in irrigated rice fields (McCully, 2001).

By 1994, rates of infection of intestinal schistosomiasis (pre-dam only urinary schistosomiasis was a problem) ranged from 25-82% of the people living near the lower Senegal irrigation schemes (McCully, 2001). Certain villages near the reservoir and in the valley reported a prevalence of schistosomiasis of close to 100% (Bosshard, 1999).

"The dramatic increase in incidences of malaria and schistosomiasis in the Valley since the Manantali and the downstream Diama Dams were built, now claim 8,000 lives a year.
 The huge Senegal Sugar Co. near the Diama Dam in the lower valley is the focus of the worst bilharzia (schistosomiasis) epidemic ever seen in Africa. More than 50,000 plantation workers are infected. In 1986, before the Diama Dam came into operation, there were no cases of bilharzia" (Sevunts, 2001).

In the past, seasonal fluctuations in flows and salinity helped keep the disease-bearing snails of schistosomiasis from taking hold (Pottinger, 1997). On the positive side, the Manantali Dam has eradicated River Blindness -

Onchocerciasis, around the inundation zone and reduced the incidence downstream (McCully, 2001).

7.9.9.2 Gambia River

The major impact in the Gambia would be from the Balingho Barrage (University of Michigan, 1985d; Samba & DeGeorges, 1987b):

- **Anemia and other nutritional diseases.** Although gains can be expected from irrigated agriculture in food supplies, it would be a long time before the loss of traditional agricultural production and projected losses in fish yields would be made up, if ever, as a result of projected major, long-term, adverse, irreversible impacts from the Balingho Barrage.
- **Urinary schistosomiasis, *Schistosoma haematobium*.** The reduction of salinity and the elimination of tidal action creating pond-like conditions with the possibility of infestation by water hyacinth would create ideal conditions for the proliferation of the snail host, *Bulinus truncate guernei*. Major, adverse, long-term and irreversible.
- **Intestinal schistosomiasis, *Schistosoma mansoni*.** The Balingho Reservoir was projected to provide an ideal environment for the proliferation of the snail host, *Biomphalaria pfeifferi*. Major, adverse, long-term and irreversible.
- **Malaria.** With the creation of a freshwater reservoir, it was predicted that the more efficient mosquito vector, *Anopheles funestus* would replace the salt flat breeding *A. melas*. *A. funestus* has a longer flight pattern and is a more efficient vector than *A. melas*. This would increase the incidence of malaria among residents living in the vicinity of the Balingho Reservoir. Major, adverse, irreversible.

Regardless of the scenario, urinary schistosomiasis was projected to intensify with the expansion of irrigated agriculture, providing additional habitat for *Bulinus globosus* (*B. jousseaumei*) along with the spread of malaria (University of Michigan, 1985d). As agriculture intensifies, it was projected that the use of pesticides would significantly increase. Organo-phosphate pesticides that are neuro-toxic would pose a direct health risk to handlers. Long-lasting in the environment, organo-chlorines would risk to bio-accumulate in fish and animal flesh, causing indirect health risks to basin residents who consume the flesh as a protein resource (Samba & DeGeorges, 1987b).

7.9.9.3 Kariba Dam, Zimbabwe/Zambia, Zambezi River

The Kariba triggered an epidemic of sleeping sickness (trypanosomiasis) amongst settlers who moved up the Sengwa River on the Zimbabwe side. Bilharzia and malaria were prevalent before and after. An outbreak of cholera in the two most densely re-settled areas of Lusitu and Siameja in Zambia would appear to be related to population pressure, inadequate and poor quality water supplies and environmental degradation; all linked to resettlement (WCD, 1999).

7.9.9.4 Cahora Bassa Dam, Zambezi River

As would be expected, “near Cahora Bassa Reservoir, water borne parasitic illnesses such as schistosomiasis and malaria now pose new health threats to the population since the dam was constructed” (Beilfuss, *et al.*, 2002).

7.9.9.5 Lesotho Highlands Water Project

HIV is believed to have made inroads into the isolated mountain communities via construction workers, of which 1 in 20 (5%) tested HIV positive along with 1 in

120 (0.83%) in nearby villages (McCully, 2001). Thamae & Pottinger (2006) place the incidence as 0.5% in villages around the dam and 5.3% in the dams' work camps in 1992. By 1999, tests of antenatal women living around Katse Dam indicated 22% were HIV positive.

7.9.9.6 Akosombo Dam/Volta Reservoir, Ghana

All reservoirs have become infected with *Bulinus spp.* snails, vectors of urinary schistosomiasis. Around the Volta Reservoir, urinary schistosomiasis increased from 10% of the riverine villages in 1966 to 90% in children living near the new reservoir in 1969. A World Health Organization (WHO)/UNDP schistosomiasis eradication program spraying molluscicides and treating infected people halved the incidence of this disease in treated people between 1975 and 1981, but still left 40% of the people in the project area infected. It only covered 60 km along a 5,000 km shoreline of the Volta Reservoir. The Volta Reservoir has flooded out large areas of blackfly breeding grounds, vectors for "river blindness" or onchocerciasis, but worsened the disease downstream because of blackfly breeding habitat created by the spillway and altered downstream flows (McCully, 2001).

7.9.9.7 Nile River, Aswan High Dam

"Since construction of the High Aswan Dam, infections of the more dangerous intestinal schistosomiasis have risen markedly, especially in the Nile Delta, possibly because the increased salinity of water in the delta favors the vector, *Biomphalaria sp.* snails which carry *Schistosomiasis mansoni* (intestinal) over the *Bulinus spp.* snail that carries *S. haematobium* (urinary). The loss of the flood, which once swept the snails out to sea, and the explosion of freshwater aquatic vegetation in the irrigation canals provided habitat for the snail vector. In 1977, a mysterious hemorrhagic disease, later identified as Rift Valley Fever-a viral disease, broke out near the Aswan. About 18,000 cases were recorded and 600

people died. Previously, it was only known in livestock. It is believed to have started as an outbreak among livestock in northern Sudan, and then spread to Egypt via human in-migration or wind-blown mosquitoes. The Nasser Reservoir provided habitat for mosquitoes which served as vectors of the virus" (McCully, 2001).

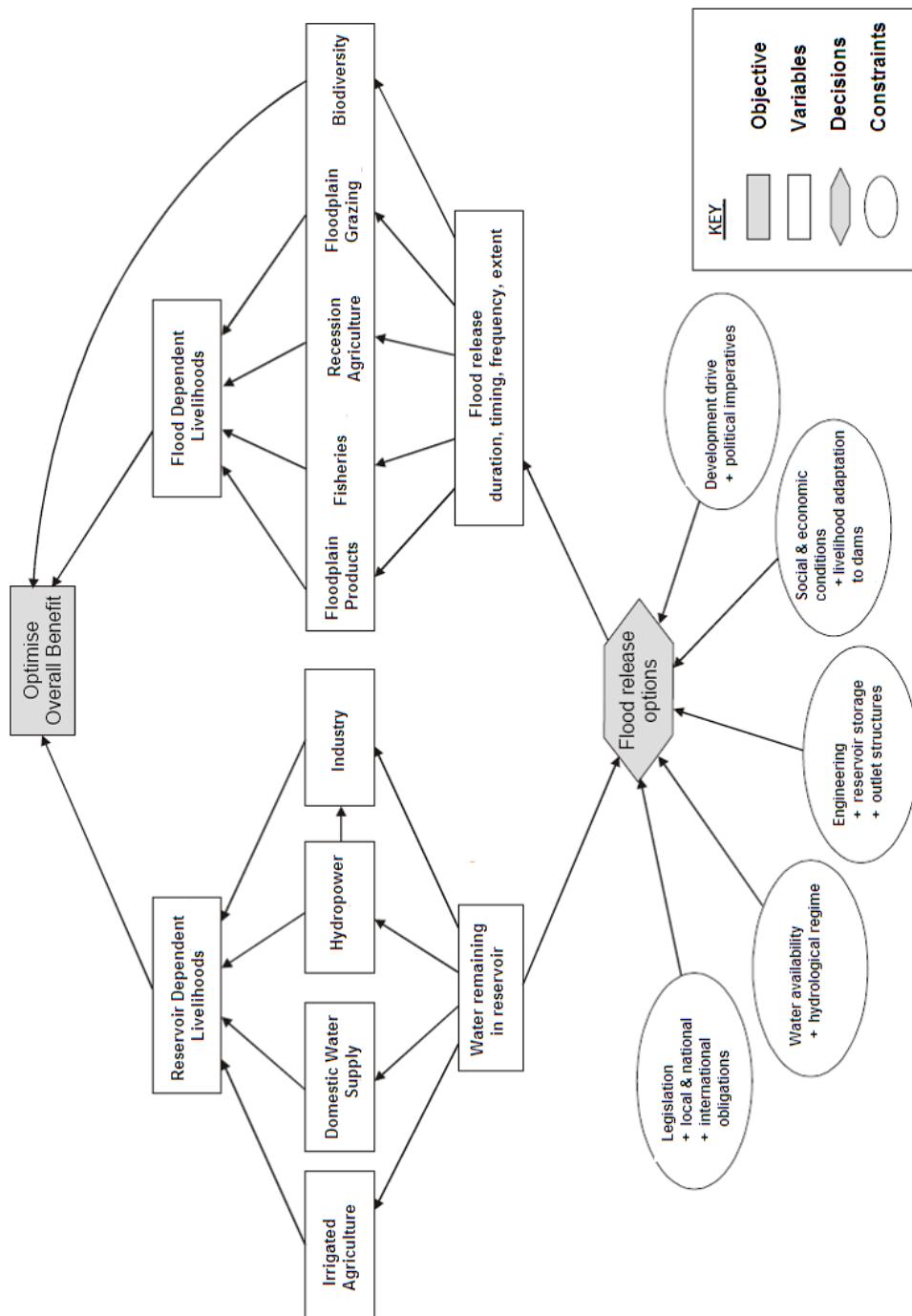
7.9.9.8 Kossou, Cote d'Ivoire

The reservoir flooded large areas of blackfly breeding grounds, vectors for "river blindness" or onchocerciasis, but worsened the disease downstream because of blackfly breeding habitat created by the spillway and altered downstream flows (McCully, 2001).

7.10 PLANNING AND MITIGATION

Mitigation is easier said than done. The problem is often the lack of political will to link technical planning into the political machinery of decision-making. Technical pre-dam planning, through multi-million dollar multi-disciplinary environmental assessments, was undertaken on both the Senegal and Gambia studies, but misused or bypassed. We know what the problems are, and how to solve them, but the will of the politicians is not there. What is provided below is theoretical.

The basis of post-dam planning might be considered the new science of "Restoration Ecology", with a major goal of returning floodplains and estuaries, modified by dams and other hydrological structures, to their traditional ecological and production roles (Adams, 2003 *In:* Adams & Mulligan, 2003). The gains and losses from controlled flooding and the tradeoffs from various uses can easily be modeled (Figure 7.14) and have been such as in the Senegal and Gambia River Basin environmental assessments. Maintaining a downstream hydrological balance is referred to in some circles as "environmental flow".



Source: Acreman, *et al.* (2000), WCD public domain

Figure 7.14: Flow chart depicting competing water uses that must be modeled against gains from controlled flooding

An ‘environmental flow’ is the provision of water within rivers and groundwater systems to maintain downstream ecosystems and their benefits, where the river or groundwater system is subject to competing water uses and flow regulation...Environmental flows are vital for healthy functioning river systems, which in turn are critical for attracting investment, achieving long term economic prosperity and the conservation of biodiversity. Environmental flows work for people as much as for plants and animals (IUCN, 2003).

What obstructs such idealistic approaches are the amoral politics of big money and the complete lack of accountability by consulting firms, donors and politicians, all of whom benefit at the expense of the voiceless rural people of Africa.

The most significant impact of most dams in Africa has been on the downstream floodplain ecosystems. As a result, the Sahelian Wetlands Expert Group (SAWEG) was formed and is linked to the IUCN. SAWEG is a network of floodplain specialists working in the Sahelian region of West Africa. SAWEG currently includes around 100 members (SAWEG, 2001):

- With a wide range of disciplines, including hydrologists, water engineers, biologists, physicists, pedologists, planners, human and animal health experts, ecologists, sociologists, legal experts and agro-foresters; □native to or working in the Sahelian countries of Nigeria, Mauritania, Senegal, Mali, Niger, Chad, Burkina Faso, the Gambia and Cameroon; and
- Representing key organizations, including universities, research institutions (both national and international), government departments, non-government organizations (from local to international, including the International Institute for the Management of Irrigation) and river basin development authorities such as the OMVS (Senegal River Basin

Authority), the Niger Basin Authority, the OMVG (Gambia River Basin Authority) and the Lake Chad Basin Commission.

Similar to the well-known author Sandra Postel in her recent book, Rivers for Life (Postel & Richter, 2003), the SAWEG group is an advocate of returning floodplains to their traditional roles, implying the use of artificial floods from controlled dam releases.

7.10.1 Planning

Sadler, *et al.* (2000) recommend new approaches to river basin planning that are more bottom-up, more inclusive of stakeholders and which adequately address environmental and social issues (Table 7.24).

The Sahelian Wetlands Expert Group (SAWEG) was formed and is linked to the IUCN. The Guidelines and Manual, “Toward the Sustainable Management of Sahelian Floodplains”, were compiled in four years of work by over 60 of the SAWEG experts from West Africa (SAWEG, 2001 with permission of IUCN):

“Planning provides a structured way of solving problems and achieving objectives. It involves viewing the floodplain and its catchment as a single system which has economic, social and environmental components that interact. Planning requires a multi-disciplinary team including experts. The steps involved in planning are described below.

- a. **Bring together key stakeholders.** Develop a process of stakeholder participation; have each stakeholder define his/her core interest rather than rigid viewpoint; develop a process of information sharing among stakeholders
- b. **Collate available information.** Develop a data collection strategy, collect data and set up databases; identify traditional floodplain uses (e.g. recession agriculture, grazing, fisheries, hunting, etc.) and involve local communities in data collection; establish a records center and

publicize its existence; make information available; establish monitoring program.

Table 7.24: Old and new concepts for river basin planning and dam placement	
Old Planning Concept	New Planning Concept
A hydro project is a technical scheme to: <ul style="list-style-type: none"> Provide basic technical infrastructure to improve supply of power/water 	A hydro project is part of an integrated set of technical, environmental and social measures to: <ul style="list-style-type: none"> Cover basic needs of people in a sustainable manner (water, light, power) Accelerate rural development to improve the welfare of people in the region – particularly those directly affected by the project Improve environmental and flood protection Combat global warming
Planning is government responsibility , often assisted by international development agencies	Planning involves many partners/stakeholders: <ul style="list-style-type: none"> Government People affected Non-governmental organizations Private sector developers Financing institutions
Least-cost planning procedure: <ul style="list-style-type: none"> Identify least-cost project to cover power/water needs Carry out unavoidable social & environmental impact mitigation at minimum cost Carry out detailed studies 	Multi-criteria planning procedure: <ul style="list-style-type: none"> Project(s) must be part of sectoral development plan Rigorous study of project alternatives, including the No-Project option Prepare comprehensive comparison matrix showing pros & cons of each alternative from technical, environmental, social, economic, financial, risk & political perspectives Quantify secondary & external costs & benefits as well as risks Reach consensus among stakeholders about overall best alternative to be developed Carry out detailed studies
Public Sector Project: <ul style="list-style-type: none"> Developed & owned by government Funding partly from international development agencies 	Private/Public Sector Project <ul style="list-style-type: none"> Developed & owned by private sector, with or without government participation Finance largely from commercial sources International development agencies act as catalyst for project funding by providing guarantees Access to semi-concessional funding if stringent international guidelines for social & environmental impact mitigation are followed

Source: Oud (1998 *In: Sadler, et al., 2000*), WCD public domain

- c. **Analyze information.** Determine health status of people and animals, hot spots and trends; review existing legislation, local and customary laws; identify thresholds for change; predict impacts of future change, such as climate; indicate uncertainty associated with results.
- d. **Define a range of development options.** Develop a master plan and involve all stakeholders; plan at the catchment scale; define a range of development options; promote restoration of sites whose value has been degraded; always have a do nothing option.

Examples of water related catchment objectives

Overall Objective	Possible Specific Targets
Fisheries	Self-sustaining edible fish population
Wetland grazing	Palatable grasses for resident and migrant herds
Recession agriculture	Seasonal flooding of riparian land
Irrigated agriculture	Controlled water available all year
Water transport	Adequate depth in water courses
Hydropower generation	Water stored in reservoir throughout the year
Water supply reliability,	Quality of supply
Wildlife conservation	Protection of habitats for rare species

Examples of development options

- Intensive irrigation
- Hydropower generation
- Aquaculture
- Desertification control
- Sustainable fisheries
- Small embankment construction to control floodwater
- Restoration of natural floodplain functions
- Establishment of nature reserves and national parks

- e. **Assess the impacts of options.** Undertake environmental impact assessments on all options; consider all impacts at the river basin, regional and international scale; impact assessment should be an integral part of the process; assess health and social implications; ensure that traditional rights are maintained; promote options that are environmentally sustainable; develop alternatives or redesign options that have negative impact on the ecosystem;
- f. **Make decisions.** Take a long-term view; consider who benefits and who loses from an option; mitigate conflicts; use multi-criteria analysis including economic valuation; favor multiple use against single sector projects" (SAWEG, 2001 with permission of IUCN).

7.10.2 Implementation

“Preferred development options should be implemented through the following three guidelines.

- a. **Principles for implementation.** Incorporate the various elements of the river basin’s ecosystems into the implementation; underpinned decisions with best science and technical advice; allow for cross-sectoral considerations in the design of investments and policies; empower stakeholders to contribute to decision making; never do at a higher level what can be done effectively at a lower level.
- b. **Guidelines for implementation** Define and maintain a step by step implementation strategy; establish an effective monitoring and evaluation framework; develop system analysis and indicators of progress and of environmental change in project / program area; establish effective co-ordination mechanisms; define the responsibilities of involved institutions; enhance existing or develop new effective self regulation systems; develop effective mechanisms for conflict resolution, negotiation and participatory planning and implementation; develop clear sets of management instruments” (SAWEG, 2001).

7.10.3 Awareness Building, Institution Strengthening and Training

- a. **“Building awareness for integrated floodplain management.** Develop and implement clear communications strategies both for projects and programs as for general campaigns.
- b. **Strengthening institutions capacity in integrated floodplain planning and management.** Develop NGO capacity to contribute to effective decision making and project development; develop collaborative management agreements between governments and local communities; establish stakeholder groups to permit input to policy development, planning and implementation.
- c. **Training and educating for effective floodplain planning and management.** Training and education efforts should focus on: development of technical expertise; training of staff in functions and values of floodplains; transfer of appropriate technology to local water managers and regional planners” (SAWEG, 2001 with permission of IUCN).

7.10.4 Financing of floodplain development

- a. **“The financial strategy.** Diversify sources of income so as to reduce risk; develop alternate financial strategies in the planning phase of the process.
- b. **Financing from foreign and domestic sources.** Consider radical ideas such as new taxes for water use; work with donors and recipients governments on debt-relief arrangements and develop innovative funding mechanisms, such as debt-for-nature swaps.
- c. **Financing from the private sector.** Develop partnerships between the private sector and government institutions; define and implement legislation, subsides and incentives to control private sector investment” (SAWEG, 2001 with permission of IUCN).

7.10.5 Policy

- a. “Develop the concept of Integrated Water Resources Management (IWRM) and seek support from international organizations.
- b. Develop a national wetlands policy in line with the guidelines provided by the Ramsar Convention and implement **the wise-use concept** promoted by the Ramsar Convention.
- c. In line with Organization for Economic Cooperation and Development (OECD) and Ramsar Convention guidelines, 1996, development agencies must therefore **discourage support of any activities that can damage floodplain functions and services**” (SAWEG, 2001 with permission of IUCN).

7.10.6 Monitoring

Once dams, development schemes (e.g., irrigation) and mitigation (e.g., artificial flooding) are in place, monitoring must take place to allow adaptive management and modification of management interventions that allow impacted communities to mitigate unanticipated adverse impacts or take advantage of unanticipated positive impacts, ecologically, economically and socially.

7.10.7 Realities of Mitigation on the Ground

7.10.7.1 Senegal River

Mitigation is basically a question of political will to partition water flows so as to maintain traditional production systems. GFCC hydrological modeling allowed for such partitioning to take place. McCully (2001) states it best in saying that

“Although discussed as a mitigative measure, to offset adverse environmental and social impacts, artificial floods rarely happen to the degree needed to bring back natural systems, especially in large multi-purpose dams where water use is often in conflict, irrigation and hydro-power being priorities over maintaining the very ecosystems that fed the people and were eliminated by the dams in the first place. In simplest terms, dam operators cannot replicate a wild river, and mitigative measures such as fish culture will not replace natural fish, fish ladders will not allow adequate upstream migrations of spawning fish, tree farms will not duplicate the role of mangroves in contributing to the detrital food chain of an estuary”.

Senegal River Floodplains

The Institute of Development Anthropology (IDA), which in 1987 began a program of research in Senegal, the Senegal River Basin Monitoring Activity (SRBMA), demonstrated that flood-recession crops offered a better return on capital and labor than irrigated farming, while reducing risks to a minimum. They suggested that a permanent artificial flood from Manantali raising the river to the level achieved by a natural flood was justified by the increased production, income and work it would provide, while also protecting the environment. Contrary to what OMVS consultants had claimed, there was no incompatibility between controlled flood releases and the production of electricity. OMVS staff told IDA’s hydrology expert that it was “dangerous” even to ask questions about

the artificial flood, as that might give farmers the idea that they were entitled to it (Adams, 2000b).

With the Manantali Dam, the annual flood has been reduced to an artificial two-week flood compared to normal flooding of up to four months (Note below dam operator estimates 7 weeks of flooding). This short duration would have a major adverse impact on such areas as fish production, groundwater recharge, silt deposition and likely both recession agriculture and pasture production. According to the World Bank, the new hydropower plant will compete with the artificial floods for agriculture and will reduce the flooded area by another 15,000 ha (Pottinger, 1997) to 20,000 ha (Bossard, 1999). The World Bank claims that after hydropower construction, floods will still allow recession farming on an area of at least 50,000 ha, except in very dry years (Pottinger, 1997; Bossard, 1999). There is reason to doubt this statement. Critics argue that the bank's forecast is based on hydrological data, which is outdated and does not reflect the reduced rainfall pattern since the 1970s. On the basis of the flows prevailing since the 1970s, the average flood would only extend to 30,000 ha and there would not be enough water for any flood every third year (Bossard, 1999) compared to the annual average flood of 459,000-549,000 ha without a dam modeled by GFCC. Pottinger (1997) interprets this as an average of 30,000 ha available for recession farming. It is believed that Pottinger's interpretation is more correct. Additional issues that would need to be asked are to what degree flushing by the flood controls soil salinization and what the silt/nutrient/trace element load dropped on the land is before as compared to after the Manantali as a means of maintaining soil productivity?

In 1997, an artificial flood was released close to the hydrograph used as a standard. Satellite images suggest that the area available for flood-recession farming was on the order of 70,000 ha, 45,000 ha on the left bank and 25,000 ha

on the right bank. A rapid survey of the *Société d'Aménagement et d'Exploitation des terres du Delta du Fleuve Sénégal* (SAED) that controlled irrigation on the Senegal River on the Senegalese side, agents and people living near major areas of flood-recession land suggested that this flood was generally satisfactory. Although, it was sometimes judged not to have lasted long enough for satisfactory flooding of low-lying land. It was an improvement over 1996, when there was scarcely any flooding, but distinctly inferior to that of 1995 (Adams, 2000c).

The other problem is the irregularity in flooding. With no announcement, the Diama would be opened and drained, encouraging people to plant maize, beans, calabashes and pumpkins along the banks only to see their work destroyed by a release of water from Manantali (Adams, 2000b). In both 1989 (Adams, 2000c; Adams, 2000d) and 1991(Adams, 2000d), two artificial floods in the same year wiped out farmers' crops planted after the passing of the first flood. OMVS's lack of respect for its promise to maintain an artificial flood is particularly striking, as the Senegalese government's position on this matter seemed to have evolved (Adams, 2000b).

GFCC (1980b; 1980d) estimated 100,000 ha available for recession agriculture under a flow of 2,500 m³/second for 30 days from August 15th to September 15th of each year. Using a minimal flow at Bakel required for a flood, where all rivers join, at 2,500 m³/second during 30 days in August and September, (Adams, 2000a), the Institute for Development Anthropology, in about 1998, assessed the following operational scenarios for the Manantali/Diama Dams, (Adams, 2000c; Adams, 2000d):

- **Scenario 1** gives priority to the needs of agriculture (irrigated and flood recession);

- **Scenario 2** gives priority to electricity generation and the needs of irrigated agriculture (with no flood support); and
- **Scenario 3** takes into account the three main objectives of the dam (supplying water for irrigation, generating electricity and flood support in favor of flood-recession farming).

Based on natural flows for the period 1970-93, which correspond more closely to present circumstances, Scenario 3 would allow 50,000 ha of flood recession farming one year in ten and 40,000 ha every other year, averaging 30,000 ha with some flood recession farming possible two out of three years. This compares to 50,000 ha of flood recession farming one year in three without dams (Adams 2000c; Adams, 2000d). “Scenario 1 yields results very close to 3, because when the river’s rate of flow is weak (as during the period under consideration), there are few releases which cannot be used for energy production” (Adams, 2000c). Scenario 2 would not allow for any artificial flooding.

This compares to the annual average flood of 459,000-549,000 ha modeled by GFCC. Over the period 1946-1971, it is estimated that on average 312,000 ha of low lying land, *waalo*, was flooded every year on both banks of the river, and 108,000 ha cultivated; on the Senegalese side of the river, 65,000 ha were cultivated (IRD-OMVS, 1999 *In:* Adams, 2000d), meaning an average of 43,000 ha cultivated on the Mauritanian side.

The artificial flood would in no way support the estimated 364,132 persons out of a total population of 592,602, who were engaged in flood-recession farming (Adams, 2000a).

According to Acreman, *et al.* (2000), since 1991, floods have been broadly in line with a hydrograph designed to flood 50,000 ha (believe means area in recession

agriculture, left and right banks total) and exceeded it in years of good rainfall, while avoiding damaging second peaks, averaging 58,000 ha (believed left and right banks) under recession cropping, an increase over drought years before the dam. This is in line with the goal of an artificial flood, allowing 50,000 ha total for left & right banks in recession agriculture even with hydropower (World Bank, 2001; Acreman, 2003; Sarnak, 2003; Scudder, 2005), though 50% less than recommended over a 15 year period by GFC&C (see Section 7.8.1.1 Senegal River).

ESKOM, the South African company operating the Manantali and its hydropower stations, estimates artificial floods lasting for about 7 weeks from the third week in August to the first week in October (Tshibingu, 2006a) or 8 weeks ending in the second week in October (OMVS/IRD, 2001), in line with flooding from other tributaries, even in dry years, but not during drought periods (traditionally a couple of weeks to up to 4 months in length, [Bossard, 1999]; 5 months for an average flood, [GFCC, 1980h]). This allows a target of 50,000 ha inundated (OMVS/IRD, 2001; Maiga, 2007; Tshibingu, 2006b) for 25 (Maiga, 2007) to 25-30 days (OMVS/IRD, 2001) to be available for recession agriculture, 80% in Senegal, 15% in Mauritania and 5% in Mali (Tshibingu, 2006b) or 34% on the right bank and 66% on the left bank (OMVS/IRD, 2001). While the target is 50,000 ha, land available for recession agriculture can vary from 45,000 ha to 70,000 ha depending on the annual rainfall (OMVS/IRD, 2001). According to Maiga (2007), by August 20th of each year, the “OMVS Water Permanent Commission” must determine if there will be an artificial flood and if so the magnitude of the flood based upon Manantali’s reservoir level and the hydrology of the Senegal River at that time.

This implies a total flood of greater than 50,000 ha annually since not all areas flooded would be viable for agriculture (e.g., depending upon location of villages

to area flooded, soil quality, pasture, etc.) (OMVS/IRD, 2001), some estimating a 100,000 ha flood being required (Acreman, 2003; WEC, 2003), while GFCC (1980b; 1980d) estimate the average annual flood would still have been 190,000 ha without artificial flooding under full development including 255,000 ha under irrigation (far from being achieved), hydropower and navigation (see Footnotes, Table 7.5). GFCC (1980d) estimated that under full irrigation development by 2028, of the 190,000 ha flooded about 64,000 ha of land would still be inundated for 30 days or more/year making it available for recession (*waalo* and *falo*) agriculture of which 73% or 47,000 ha (44,500 in *waalo*) would be cultivated. This compares to the “smallest recorded flood” in 1972 of 104,000 ha as opposed to the largest recorded historical flood of 838,000 ha in 1924 (GFCC, 1980b; 1980d). Thus land currently available for recession agriculture is not too different from the GFCC scenario under full development, only that irrigated agriculture has failed to make up for the loss of traditional production systems. If one applies the formula OMVS/IRD (2001) of:

- Recession Agriculture (ha) Matam to Dagana =

$$[1.1392 \text{ Total Area Flooded (ha)}] - 34,289 + 5,890$$

derived from a data curve that assures 45,000 – 70,000 ha in ha recession agriculture four out of five years for annual floods not greater than 100,000 ha, and for areas under recession not greater than 80,000 ha [no formulas were provided for once every two years, the scenario currently chosen by OMVS (OMVS/IRD, 2001; Maiga, 2007) - though both curves are fairly close together], then the following can be determined (Figure 7.4):

- For 45,000 ha in recession agriculture a total annual flood of 64,430 ha from Dagana to Matam;
- For 50,000 ha in recession agriculture a total flood of annual 68,819 ha from Dagana to Matam; and
- For 70,000 ha in recession agriculture a total flood of annual 86,376 ha from Dagana to Matam.

In addition, based upon the analysis of satellite imagery from 1998/99, the area flooded above Matam amounted to about 19% of the area flooded between Dagana and Matam. Another 1% came from the Koundi marigot in the Middle Valley of Mauritania and Ngalenga marigot in the Lower Valley of Senegal (OMVS/IRD, 2001). This implies that the total area flooded is larger area than indicated by the above equation and that a slightly larger area than shown above (45,000, 50,000 & 70,000 ha) is available for recession agriculture. If this is the case, under the above annual flood scenarios one might expect:

- For 45,000 ha plus in recession agriculture, total area flooded in SRB Valley = $64,430 + (0.20 \times 64,430) = 77,316$ ha;
- For 50,000 ha plus in recession agriculture, total area flooded in SRB Valley = $68,819 + (0.20 \times 68,819) = 82,583$ ha; and
- For 70,000 ha plus in recession agriculture, total area flooded in SRB Valley = $86,376 + (0.20 \times 86,376) = Y$ or 103,651 ha.

Available pasture has been significantly reduced (Acreman, 2003), our analysis estimating a loss of 355,000 - 472,000 ha of pasture/year or more depending how much of the flood recession agricultural residue is made available to livestock after the harvest (see Section 7.8.9.1, Senegal River). It can easily be ascertained

due to a decline in both magnitude and duration of flooding that the freshwater fishery yield would be significantly lower than projected by the GFCC study at an average 190,000 ha total flood/year after full development versus an actual 77,000 – 104,000 ha total flood/year at 60 kg/ha annual yield/catch (4,620-6,240 tons/yr), or less due to flood durations on average of 5 months in the pre-dam era versus 7-8 weeks today that would adversely impact fish production and thus the annual yield/catch. If pre-dam fisheries averaged 46,755 tons/year (see Table 7.5) and post dam fisheries as predicted are 3,000 tons/yr from the Manantali reservoir (see Table 7.6), 4,620-6,240 tons/yr from the floodplains based upon ESKOM flood estimates, and 10,186 tons/yr from the Delta area (see Table 7.6), this would result in yields of 17,806 – 19,426 tons/yr or less; a deficit of 27,329 -28,949 tons/yr of fish (58%-62% decline). A limited flood of this duration and magnitude could also continue to adversely impact upon groundwater recharge and the quantity and area of nutrient rich sediment deposited on the floodplains.

The continuation of an artificial flood will require 1) political will and 2) specific instructions from the OMVS to the private operator (ESKOM South Africa) of the Manantali Dam, requiring the allocation of water for such purposes on an annual basis. Uncertainty remains about the will of the member states to maintain the artificial flood, a suspicion confirmed by OMVS's pursuit of the navigation component of its program, a year-round water level requiring water in excess of that required by irrigation (Adams, 2000c).

It is to be feared that, given the generally disappointing results of the agricultural development and the very shaky economic basis of the navigational sector, the riparian countries will be “forced” to reimburse the loans contracted for the building of the hydraulic infrastructure, almost entirely from the sale of electricity. This may compromise the continued support of the artificial flood, which, though officially justified only by the needs of recession agriculture, has at

least partially satisfied the more general water needs of the multi-functional floodplains (Pottinger, 1997; Hamerlynck, *et al.*, 2000).

There is a fundamental choice to be made in agricultural policy for the Senegal River Valley, between striving to make the dams generate revenue from electricity, large-scale irrigation, river transport, etc., or using them to ensure the survival of downstream family farming and related activities (e.g., flood recession agriculture, dry season forage, freshwater and estuarine fisheries). This debate has not taken place and if the debate does not take place now, the question will not be resolved once and for all, and the losers from the Manantali Dam will have lost out forever (Adams, 2000c). Ideally, there will be a need for a degree of compromise on both sides, hopefully assuring the long-term viability of natural production systems.

Senegal River Estuary, Bas Delta of Mauritania

Plans also existed to create an artificial estuary linked to the Diawling (Jawling) National Park, Mauritania. As a means of mitigating the above changes, the USAID assessment recommended constructing a 3 km long canal from Debi on the Senegal River to the Tianbrank-Diaouling Complex on the Mauritanian side of the river. The canal is upstream of the Diama Dam. By use of control gates and/or passive flooding by flow regulation from the Manantali Dam, this complex could be turned into an artificial estuary, which would in part help to offset the above losses, as well as greatly diminish the risk of species extinction. At the time, 1984, the following was concluded (DeGeorges, 1984): 1) additional studies would not improve on the ability of the decision-making process as to what mitigative actions might be necessary in this study area; 2) it was considered a worthwhile risk to continue in an operational mode to create an artificial estuary; 3) there should be no delusion that creation of an artificial estuary of 10,000-

35,000 ha might replace that which would be lost on both sides of the river, amounting to 100s of 1000s of ha of aquatic habitat; 4) it might help maintain the integrated traditional life styles of 4-5,000 persons through a combination of fishing, herding and truck farming; 5) a monitoring and surveillance program should be developed by OMVS to monitor fisheries, aquatic and terrestrial ecology as the result of an operational artificial estuary; 6) the people of the Bas Delta should be organized into independent cooperatives to aid them in improving yields from fishing, truck gardening and to improve transport of produce to the market place; 7) involvement of the *prefet* of Keur Macene and the *Direction de Pêche de Mauritanie* in the above decision-making processes was considered critical; and 8) The Bas Delta supported 842 families amounting to 4-5,000 people of which 349 families depended upon fishing as a major occupation.

At the time, the plan was to construct a dike with control gates between the dunes of Ebden and Burette, and Ebden and the coastal dune in order to close off the Bas Delta from the main estuary. Plans were to close the gates in August and use controlled flooding from the Manantali to inundate the Bas Delta from north to south via the Walalane *Marigot*. This would have been the reverse of traditional water movement off the main river northward during flooding (DeGeorges, 1984) and it was unclear how this might impact water quality and the movement of migratory fish species.

According to Hamerlynck, *et al.* (2000), the salinisation tendency of the Lower Delta, already evident with the weaker floods of the seventies, was exacerbated during and after the construction of the Diama Dam and the associated embankments, finished in 1990. With the exception of the flood of 1987 there was a very low input of fresh water into the floodplains. Eolian deposits in the channels have severely disturbed the flow patterns. Wells tapping the freshwater

lenses in the dunes have progressively become more saline in a south to north sequence.

To support this decidedly modern approach, the Mauritanian government, IUCN and its local and foreign partners started in 1994 by organising a visit of a multi-disciplinary team, composed of sociologists, hydrologists, agronomists, ichthyologists, protected area specialists, a botanist and an estuarine ecologist. In order to integrate the views of the local population, a participatory approach was favoured. It was immediately clear that local knowledge of the former functioning of the system was highly developed and that it would be indispensable for the drafting of the management plan (Hamerlynck, *et al.*, 2001). About 16,000 ha have been placed under management (Kloff, 2002).

At the start of the IUCN project in 1994, of the hydraulic infrastructure needed to restore the flooding and create the artificial estuary, and that should therefore have been in place at the Diama Dam closure in 1986, only the sluice gate at Lemer was fully operational. The implementation of the rest of the major objectives of the management plan (1997-2000) was jointly financed by the *Caisse Française de Développement*, the *Fonds Français pour l'Environnement Mondial* and IUCN. As the local fishermen had an extremely detailed knowledge of pre-dam hydrology and fish migration and spawning patterns, technical collaboration was very productive. The Berbar sluice gate was added to the original scheme in order to allow for fish migration to and from the spawning grounds in the Diawling-Tichilit Basin. The extra expense on this sluice and a second one (the Lekser sluice gate) for shrimp migration, added on the advice of the brackish water fishermen of Zire Sbeikha, prevented the project from completing the embankment that should have been delimiting the park's northern edge. Manipulation of floods allowed certain fish species, *Sporobolus spp.* and other grasses, and water birds to come back (Hammerlynck, *et al.*, 2000).

The basic scenario of artificial flooding is (Acreman, *et al.*, 2000):

- On 1 August releases are increased so that the water level rises at maximum 1 cm/day, so that the growth of grasses, such as *Sporobolus robustus* and *Echinocloa colona* can keep pace. The grass provides habitat for fish that spawn on the floodplain and for the nesting of crowned cranes.
- Annual yield/catch of fish increases with flooded area by around 100 kg/ha.
- The flooded wetlands provide habitat for many thousands of migratory birds.
- After 45 days of inundation, salt has been leached from the soils and the water is allowed to drain off, to prevent colonization by unwanted species such as *Typha* and cypergrasses.
- In the dry season, the *Sporobolus* is exploited for the production of mats, providing the main source of income for local women.
- The *Echinocloa* provides excellent grazing for the thousands of cattle visiting the delta.

Village gardening began. *Sporobolus spp.* allowed the development of a pilot project for the artisanal production of mats made of grass and leather, a specialty of the Moorish women. Concern existed that development was resulting in immigration of people to take advantage of improved fishing, pasture and agriculture, resulting in overuse of the limited resources. Concern exists that the Diawling Park may become a green fleck surrounded by agricultural land as “ecological refugees” move in from other degraded areas to take advantage of economic opportunities. This would place excessive pressure on the resource base. (Hamerlynck, *et al.*, 2001; Hamerlynck & Duvail, 2003).

The development of market gardening may also increase pressure to modify the water management system: the main market gardening season is January to March, when the park is normally progressively drying out and its waters are becoming brackish. Putting more fresh water in that season may irrevocably modify the diverse pastures of the basins into the reed-mace mono-culture observed in the Diama Reservoir. Similar claims for as much fresh water as possible for as long as possible have caused severe degradation and loss of multi-functional floodplains in the Upper Delta (Hamerlynck, *et al.*, 2001).

One might ask if what we are witnessing is an attempt to recreate a natural system whose productivity can never be replaced and whose limited size and resource base in the form of a 16,000 ha artificial estuary is too small given the current human population pressures in the area. Is this reversed development? Is this not the same phenomenon being observed in “community programs” all over Africa, where people have been compressed into areas that can no longer support them to create farms for European settlers, as well as parks and protected areas, and where these same people are encouraged to become sedentary? Combined with the 20th century population explosion, even if in a natural state, much of rural Africa can no longer support the majority of people in traditional lifestyles. This is raised over and over again throughout this book, but once again conservation on its own that does not fit into a larger development plan linked to urbanization and industrialization/high tech that can take the pressures off these rural areas and their associated subsistence lifestyles appears to fail. Africa’s fragile ecosystems are not evolving to support current human population numbers. Conservation fails even more when so-called development makes things worse instead of better! Hamerlynck and Duvail (2003) indicate that by 1998 floods reached the Southern portion of the Aftout-es-Sahel, with goals of flooding up to 50,000 ha. This is 15,000 ha above the originally planned artificial estuary maximum of 35,000 ha (DeGeorges, 1984). Research is ongoing as to the relationship between

duration of flooding and production for various resources (Hamerlynck & Duvail, 2003).

7.10.7.2 Gambia River

Major mitigative actions to most adverse impacts would be to develop the Gambia River Basin without the Balingho Barrage and ideally without the Kekreti, preferentially with a high dam in the Guinean portion of the basin. Of course, this implies that flow regulations would assure the survival of traditional production systems as described in this chapter. It appears the Sambangalou has been selected (International Water Power and Dam Construction, 2005).

7.10.7.3 Kariba and Cahora Bassa Dams, Zambezi River

The Government of Mozambique has recently declared the Marromeu Complex of the Zambezi Delta as the first “Wetland of International Importance” in Mozambique, under the Ramsar Convention on Wetlands, an international agreement for the protection and sustainable use of wetlands. The 688,000 ha Marromeu Complex includes the Marromeu Special Buffalo Reserve, four surrounding hunting concessions (*coutadas* 10, 11, 12 and 14), the Sena Sugar Estate and coastal mangroves on the south bank of the Zambezi Delta (Zambezi Valley News, 2003a) (Figure 7.5). Once again, the major mitigative activity would be controlled flooding downstream of the two dams.

“Prescribed flood releases from Cahora Bassa Dam, however, are achievable. Cahora Bassa’s 8 sluice gates are located 111 meters below the crest...and are below the average operating level of the reservoir, while Kariba’s...gates are installed near the crest of the dam and are only operated for emergency water releases when the reservoir is near capacity” (Beilfuss, 2001). “The crest height of the Cahora Bassa Dam face is 331 meters and that of the Kariba 131 meters high” (Beilfuss & dos Santos, 2001). “Beilfuss has

simulated the capacity for different flood releases from Cahora Bassa Dam using the HEC-5 reservoir routing model for the entire Zambezi catchment. Using an historical 92-year flow series accepted by the SADCC Hydroelectric Hydrological Assistance Project and *Unidade Tecnica de Implementacao de Projectos Hidroelectricos-Mozambique*, he modeled the potential to generate short-duration, high-volume flood releases of different magnitude, timing, and duration from Cahora Bassa Dam. Each flood release is analyzed in terms of its effect on hydropower generation, including firm power reliability and total energy output. The study demonstrates that a variety of options are available for generating meaningful flood pulses during the normal flood season months of January, February, or March, without a significant reduction in hydropower" (Zambezi Valley News, 2003b).

Four steps are recommended towards the creation of an artificial flood (Zambezi Valley News, 2003b):

- Applied research on environmental, social and economic implications of an artificial flood.
- Assessment of flood magnitude and duration on physical and biological processes such as sediment deposition on floodplains, the release of hypolimnion waters on fish populations, vegetative communities and wildlife.
- Analysis of socio-economic impacts of an artificial flood such as on recession agriculture, grazing and fishery production (e.g., people now settled on floodplains would need to move again and one would have to determine how to flood the Marromeu Complex without adversely impacting the Senna Sugar Estate).
- Development of an integrated plan and operational scenarios of flow releases creating an artificial flood that to various degrees maximizes benefits to all or some of the above parameters.

It is planned that these scenarios will be developed in collaboration with all stakeholders, including the Sena Sugar Estate, safari operators, government and other affected people (e.g., local communities, especially those who are living on the floodplain). Once a final operational scenario has been chosen, monitoring of controlled flooding and its impacts will take place and adjustments will be made in flow releases to maximize benefits to all stakeholders and related resources.

However, the tradeoffs mean quick money from electricity of US\$ 20 to US\$ 30 million/year or some 10% to 15% of the value of Cahora Bassa power generation (WCD, 1999). A new power system will be built at M'panda Ncua, 130 km (50 miles) downstream from Cahora Bassa (Issacman & Sneddon, 2000). The M'panda Ncua is a run-of-the river scheme dependent on the release of water from Cahora Bassa (UTIP, 2002).

Coinciding with high flows from other tributaries (e.g., Shire River), modeling of controlled releases from Cahora Bassa in February of $7 \times 10^9 \text{ m}^3$ (*i.e.* $2,894 \text{ m}^3/\text{s}$) in excess of power generation needs would create the desired flood peak of 9 000 m^3/s at Dona Ana, on the lower reaches of the river. As a result, energy production at Cahora Bassa South (power station/turbines) is reduced by about 8-11 %, with losses rising to 13-16% on completion of Cahora Bassa North (power station/turbines), while losses at M'panda Ncua are 7-9%. Hydropower sales from Cahora Bassa South are currently valued at about US\$ 200 million/year (Euros 215 million). The cost of an 8% loss in hydropower sales due to an environmental flow release would be about US\$ 16 million/year (Euros 17 million), while the benefits from increased food security and shrimp production downstream could exceed this figure (UTIP, 2002) along with improvements in biodiversity(UTIP, 2002).

“Investment in additional hydropower at Mepanda Uncua (M’panda Ncua) or Cahora Bassa North would increase the costs and reduce the likelihood of environmental flow releases in future” (UTIP, 2002).

Lessons of the past are still being obscured in the name of development. This will complicate the possibility of restoring the Lower Zambezi’s ecological systems through controlled flood releases from Cahora Bassa to restore pre-Cahora Bassa levels of floodplain fisheries and agricultural production. Despite the history of Cahora Bassa, the Mozambican government’s desire to harness economic benefits from the Zambezi, above social and ecological goals appears to be pushing towards the construction of what could be another white elephant (Isaacman & Sneddon, 2000). It is said that the World Bank supported the Mozal aluminum smelter, employing 400 people, which at peak will use 75% of Mozambique’s electricity. This smelter, owned primarily by BHP Billiton, a London-listed merger partner of Gencor (South African owned), and minority shareholder Japanese Mitsubishi Corporation (Bond, 2002), along with the new hydropower schemes will make the partitioning of water for artificial floods that much more difficult. Multi-stakeholder workshops will take place to determine how to best address the various demands for water in the Lower Zambezi (UTIP, 2002). The first such meeting took place in 2005.

7.10.7.4 Kafue Flats, Zambia

A priority must be to restore the original population size of Kafue lechwe and to reintroduce this species into areas where it no longer occurs. In the 1960s, the Worldwide Fund for Nature bought two farm estates in the central region of the Kafue Flats and established Lochinvar National Park and Blue Lagoon National Park, both declared Ramsar wetland sites. WWF-Zambia is trying to develop a partnership with ZESCO – the Zambian Electricity Supply Company – and the

Zambian government to improve water management in the flats by changing the operational rules of the Itezhitezhi Dam. WWF Zambia has started the “Integrated Water Management Project for the Kafue Flats”, in close cooperation with the Zambian government. Water experts from Zambia and the Netherlands are developing an optimal water management strategy for the flats with the principle that a healthy wetland will benefit both people and nature, with the goal of adoption by 2002 by the key stakeholders (including ZESCO, the sugar cane industry, the local communities etc.). Implementation programs should subsequently lead to a drastic change of the current water management – with its clear negative impact (WWF/Netherlands, 2002). DFID (2002) states

“that an integrated water resources management strategy should be developed for the whole of the Kafue Basin. Development must address local as well as national needs and so to be successful, local communities must be involved in the planning and management of the water and other natural resources of the Kafue Flats”.

The World Bank plans development of a road network and private lodges to turn the Kafue area into a major tourist attraction (Pavy, *pers. comm.*).

7.10.7.5 Waza Logone Floodplain, Cameroon

The opening up of the Petit Guruma water course in 1994 and the Areitekele water course in 1997 has helped to increase the flooded area by 200 km² (20,000 ha) or about 20% of the 964 km² (\approx 100,000 ha)¹⁸⁴ lost as a result of the SEMRY rice scheme and its Maga Dam. This resulted in the following benefits (Table 7.25) (Loth, 2004). This amounts to a 34 % net gain over the Euros 2,565,700 loss from the SEMRY scheme/Maga Dam.

¹⁸⁴ “The Waza Logone floodplain mostly refers only to that part of the Yaéres that are located East of the Waza Park down to the Maga dam” (Loth, 2004/8/16).

Table 7.25: Net benefits from pilot artificial flooding of Waza Logone Floodplains

ECONOMIC SECTORS	BENEFITS FROM RESTORED FLOODPLAIN INUNDATION (Euros/US\$)
Pasture Benefits	291,200/343,616
Fisheries Benefits	224,700/265,146
Agricultural Benefits	151,800/179,124
Grass Benefits	194,200/229,156
Bee Keeping	900/1,062
Surface Water Supply Benefits	8,700/10,266
NET BENEFITS	871,500/1,028,370

Source: Extracted from Loth (2004) with permission, IUCN.

These pilot schemes had a major positive impact on wildlife populations within the Waza Park, which relied on the floodplain as a dry season grazing area, demonstrating the value of artificial flooding. Major increases were observed in western kob, korrigum and roan antelope populations (Loth, 2004).

Since artificial flooding began in 1994, there has been a shift back to perennial grasses on the floodplain, especially the annual grass *Sorghum arundinaceum*, which decreased in the impact zone from 58% to 34%, while the cover of perennial grasses, most notably *Echinochloa pyramidalis* and *Oryza longistaminata* increased from 41 to 61% (Loth, 2004). This change, combined with flooding of natural waterholes on the floodplains providing water during the dry season, has resulted in an increased use of the floodplains by elephants, especially during the dry season, taking pressure off the *Acacia seyal* woodlands (de Iongh, *et al.*, 1999). However, crop raiding to the south after artificial flooding did not decrease as had been hypothesized, increasing from 10 ha in 1980 to 10,000 ha by 1998, the area raided fluctuating between 8,000 and 12,000 ha (de Iongh, *et al.*, 2004).

In addition, fishers caught 1,777 tons of fish in the additional 200 km² of flooded area during the pilot phase, while cattle numbers increased 260% without any sign of degradation to the floodplain grasslands in the pilot flood zone (Loth, 2004).

Based on the positive results from pilot artificial flooding, a number of scenarios were developed to expand flooding of the Waza Logone Floodplain without negatively impacting the SEMRY rice schemes (Table 7.26):

Table 7.26: Re-inundation options, Waza Logone Floodplain

Option	Additional Flow (m ³ /sec)	Total Flow (m ³)	% Restoration In Average Year	Total Area Reflooded Including Pilot Areas (km ²)		
				Good Year	Average Year	Poor Year
X	215	250	90	916	867	646
Y	165	200	71	839	687	532
Z	115	150	50	645	479	291

Source: Loth (2004) with permission, IUCN.

The cost/benefits from the above options were estimated to be (Table 7.27):

Table 7.27: Estimated cost and benefits for various options for artificial flooding of the Waza Logone Floodplain

Options	Physical Costs of Re-Inundation Over 5-Years		Incremental Net Benefits of Re-Inundation	
	Total (Euros/US\$)	Per km ² (Euros/US\$)	Total (Euros/US\$)	Per km ² (Euros/US\$)
X	-12,012,000/14,174,160	-3,140/3,705	2,475,000/2,920500	13,858/16,352
Y	-7,719,000/9,108,420	-3,125/3,688	1,901,000/2,243,180	11,235/13,257
Z	-3,495,000/4,124,100	-3,018/3,561	1,227,000/1,447,860	7,302/8,616

Source: Extracted from Loth (2004) with permission, IUCN.

It was recommended that Option X, based on the highest economic benefits overall and relative to costs, or Option Y, the most robust in face of risk and uncertainty of rainfall, should be implemented (Loth, 2004). Unfortunately, these

artificial floods have not been carried out on a regular basis (Funston, *pers. comm.*; *Tchamba, pers. comm.*), while wildlife must compete with cattle that move onto the floodplains, with the net result that initial gains in wildlife populations have been lost. (Funston, *pers. comm.*).

7.10.7.6 Tiga and Challawa Gorge Dams, Komadugu-Yobe River Basin, Nigeria

In the Komadugu-Yobe basin of northeastern Nigeria, there is unanimous consensus among policymakers, scientists and river basin managers that artificial flooding should play a central role in the integrated development of the river basin. As a result, wet season floods have been released from Tiga and Challawa Gorge Dams (Beilfuss, 2001).

7.10.7.7 Controlled flooding to restore floodplain production on the Pongola Floodplains, South Africa

Controlled floods from dams on the Pongola River, South Africa, provide recession irrigation, grazing and water supply to downstream users. Initial efforts to restore the downstream floodplain failed because flood releases were made at the inappropriate time of year and damaged floodplain crops (Bruwer, 1997 *In:* Beilfuss, 2001). Flood release schedules are now stipulated by the downstream community through water committees organized among 14 wards that represent the views and needs of the 70,000 inhabitants of the Pongola Floodplain (Acreman, *et al.*, 2000; Beilfuss, 2001).

7.10.8 Opposition to Large Dams

The authors believe that properly placed and with appropriate mitigation, large-scale dams (dam wall higher than 15 meters higher) have value. Unfortunately, as the case studies in this chapter demonstrate, mitigation rarely happens; corruption and big profits often get in the way of doing what is correct from a technical viewpoint. A coalition of NGOs published the following reasons why large- scale hydropower should be considered as a last resort (IRN, 2003).

7.10.8.1 A major expansion of large dams will harm sustainable development

1. Large hydro does not have the poverty reduction benefits of decentralized renewables.
2. Including large hydro in renewable (energy) initiatives would crowd out funds for new renewables.
3. Promoters of large hydro regularly underestimate costs and exaggerate benefits.
4. Large hydro will increase vulnerability to climate change.
5. There is no technology transfer benefit from large hydro.

7.10.8.2 A major expansion of large hydro will harm people and ecosystems

6. Large hydro projects have major negative social and ecological impacts.
7. Efforts to mitigate the impacts of large hydro typically fail.
8. Most large hydro developers and funders oppose measures to prevent the construction of destructive projects.
9. Large reservoirs can emit significant amounts of greenhouse gases.

7.10.8.3 A major expansion of large hydro will harm energy security

10. Large hydro is slow, lumpy, inflexible and getting more expensive.
11. Many countries are already overly dependent on hydropower.
12. Large hydro reservoirs are often rendered non-renewable by sedimentation.

The World Bank has calculated that every year some 0.5-1% of global reservoir capacity is lost to sedimentation (meaning that 240-480 new large dams would have to be completed every year just to maintain global reservoir capacity).

7.10.9 Water for life, not for death!

At the Second International Meeting of Dam Affected People and their Allies, Rasi Salai, Thailand, 28 November - 4 December 2003, the following principles and demands of the Curitiba Declaration¹⁸⁵ of 1997 reaffirmed (Rasi Salai Declaration, 2003):

- “We oppose the construction of all socially and environmentally destructive dams. We oppose the construction of any dam which has not been approved by the affected peoples after an informed and participatory decision-making process, and that does not meet community-prioritized needs.
- We demand full respect for indigenous peoples' knowledge, customary resource management and territories and their collective rights to self-determination and free, prior and informed consent in water and energy planning and decision-making.

¹⁸⁵ Affirming the Right to Life and Livelihood of People Affected by Dams, Approved at the First International Meeting of People Affected by Dams, Curitiba, Brazil, March 14, 1997
<http://www.irn.org/dayofaction/index.asp?id=background2.html>.

- Gender equity must be upheld in all water and energy policies, programs and projects.
- There must be a halt to the use of all forms of violence, intimidation and military intervention against peoples affected and threatened by dams and organizations opposing dams.
- Reparations must be made through negotiations to the millions who have suffered because of dams, including through the provision of funds, adequate land, housing and social infrastructure. Dam funders and developers and those who profit from dams should bear the cost of reparations.
- Actions, including decommissioning, must be taken to restore ecosystems and livelihoods damaged by dams and to safeguard riverine ecological diversity.
- We reject privatization of the power and water sectors. We demand democratic, accountable and effective public control and appropriate regulation of electricity and water utilities.
- Governments, funding institutions, export credit agencies and corporations must comply with the recommendations of the WCD, in particular those on public acceptance and informed consent, reparations and existing dams, ecosystems and needs and options assessments. These recommendations should be incorporated into national policies and laws and regional initiatives.
- Governments must ensure investments in research and application of just and sustainable energy technologies and water management. Governments must implement policies which discourage waste and over consumption and guarantee equitable distribution of wealth.
- The construction of interbasin transfer schemes, river inter-linking and other water megaprojects must halt.
- The international carbon market must be eliminated.
- Waterways for navigation should follow the principle ‘adapt the boat to the river, not the river to the boat.’

We commit ourselves to:

- Intensifying our struggles and campaigns against destructive dams and for reparations and river and watershed restoration.
- Working to implement worldwide sustainable and appropriate methods of water and energy management such as rainwater harvesting and community-managed renewable energy schemes.
- Continuous renewal and vitalization of diverse water knowledge and traditions through practical learning especially for our children and youth.
- Intensifying exchanges between activists and movements working on dams, water and energy, including through reciprocal visits of affected peoples from different countries.
- Strengthening our movements by joining with others struggling against the neo-liberal development model and for global social and ecological justice.
- Celebrate each year the International Day of Action Against Dams and for Rivers, Water and Life (March 14)".

Unless the West's attitude towards "development" in Sub-Saharan Africa is undertaken with the goal of really helping the subcontinent move forward instead of making a quick profit at the expense of its people and their natural resources, the authors would tend to agree with these conclusions. However, if the West's and Sub-Saharan Africa's political elite change their attitudes and want to do it right – then in a number of instances, such as a large dam properly located in the Gambia River (Sambangalou Dam), large dams could play a vital and multi-faceted role (electricity, irrigation, potable water, flood control and artificial floods to maintain traditional food producing ecosystems, navigation, etc.). Unfortunately, at this time the willingness to develop a "Hippocratic Oath" for development including dams appears to be far in the future. Transparency International (2005) goes into great detail as to why construction projects in

general are prone to corruption. This is due to the complex network of contracts between governments, donors, contractors and subcontractors and the construction industry's culture of secrecy with opportunities for cost overruns, kickbacks, using less material than specified in the contract (e.g., watering down cement, less re-enforcement steel than specified), etc. Bribery is often seen as a cost of doing business in order to be awarded a contract. Maybe taking some of the individuals, governments and dam builders to court for human rights violations could set a precedent for the development of moral and ethical values related to not only dams, but also conservation and development.

7.11 ALTERNATIVES TO LARGE DAMS

Alternatives to large dams include:

- **The improvement of traditional agricultural production systems** – dryland farming and recession agriculture, fisheries management and pasture management (Postel, 2002).
- **Alternative energy** – gas, wind, solar, small hydro (up to 10 MW), improved firewood/charcoal management/efficiency, (Postel, 2002; IRN, 2003), geothermal, tidal, wave and other marine energy (IRN 2003). One of the most prominent global initiatives is the Johannesburg Renewable Energy Coalition (JREC), launched by the European Union (EU) at the Earth Summit/World Summit on Sustainable Development (WSSD) in Johannesburg in September 2002 with 80 countries joining by 2003 (IRN, 2003). With all of the dams that have been built, “80% of Sub-Saharan Africans have no electricity. Access to basic, clean energy services – including non-electrical technologies such as biogas, improved cooking stoves and mini-hydro plants used for mechanical power – is essential for

poverty eradication. These services can also provide major health and literacy benefits" (IRN 2003).

- **Watershed management** to capture and store water (Postel, 2002).
- **Wetland protection** to moderate floods (Postel, 2002).
- **Mini-barrages** as discussed in Section 7.9.5.2, Gambia River.
- **Micro-irrigation** in gardens – In Zimbabwe, 20,000 ha is irrigated like this, 10% of all irrigation in country (Postel, 2002).
- **Efficient water use control and conservation**, which are aspects of water demand management (Bobotti, 2000).
- **Water recycling and groundwater recharging** which require the right technology (Bobotti, 2000).
- **Water storage** development and distribution for different uses, to different places of use and at the appropriate time, which require the right technology and substantial funding (Bobotti, 2000) (e.g., local rain water harvesting, underground reservoirs).
- **Enabling environment of good governance**, which makes and pursues the right policies (Bobotti, 2000).

During the decade since the Earth Summit in Rio de Janeiro, Brazil, the world's water problems have worsened markedly even as concern about them has risen steadily. Overshadowed at Rio by other pressing issues, notably climate change, biodiversity, and forests, fresh water came under a brighter spotlight during the 1990s. A steady stream of global commissions, conferences, and networks drew attention to water's fundamental importance to food production, human health, poverty alleviation, ecosystem protection, and regional peace and stability (Postel, 2002).

Actual improvements on the ground, however, have lagged badly behind this growing awareness. At the World Summit on Sustainable Development

(WSSD) in Johannesburg, South Africa, Governments and society-at-large took a new and critical opportunity to make efficient, equitable, and sustainable use of fresh water a top priority. U.N. Secretary-General Kofi Annan identified water as one of five areas (along with energy, health, agriculture, and biodiversity) (Postel, 2002).

All non-marine life depends on fresh water for survival. Even many coastal marine organisms rely on rivers that empty into the sea for nutrients and the maintenance of particular levels of salinity. Water is therefore not just a commodity, like oil or copper, but rather a fundamental life support. Rivers, lakes, wetlands and other freshwater ecosystems are not just sources of supply; they are habitat for a wide variety of plant and animal species. These ecosystems also perform valuable services for human societies such as moderating floods and droughts, purifying water, and sustaining fisheries. As a resource for human activities, fresh water is also unique in that it has no substitutes in most of its uses. It is essential for growing crops, for manufacturing material goods, and for drinking, cooking, and other household functions (Postel, 2002).

Throughout the 20th century, the principal challenge of water managers was to satisfy humanity's rising demand for irrigation, urban-industrial water supplies, flood reduction, and hydropower generation. They did this by building more and larger dams, dikes, river diversions, and groundwater wells. Just since 1950, the number of large dams (those at least 15 meters high) has climbed from 5,000 to 45,000, an average of two new large dams a day for the last half century (Postel, 2002).

This combination of rising demand and ecosystem alteration has depleted supplies, damaged ecosystems, and placed a large share of freshwater life at

risk of extinction. Water tables are falling from the over-pumping of groundwater in large portions of China, India, Iran, Mexico, the Middle East, North Africa, Saudi Arabia, and the United States. Many major rivers including the Colorado, Ganges, Indus, Rio Grande, and Yellow now run dry for portions of the year (Postel, 2002).

Freshwater wetlands have shrunk by about half worldwide. Moreover, increasingly, competition for water threatens social and political stability both within and between countries. In recent years, violent protests have erupted in the lower reaches of China's Yellow River and Pakistan's Indus River as farmers faced the prospect of a cropping season without sufficient irrigation water (Postel, 2002).

A fundamentally new approach to water and human development will be needed during this new century an approach that aims to satisfy the water needs of 8-10 billion people while protecting the ecosystems that sustain our economies and all terrestrial life (Postel, 2002).

7.12 CONCLUSION

It can be argued that by the time dam construction really took off, there should have been enough knowledge by Western dam builders, who moved into Sub-Saharan Africa, to understand the environmental and social consequences of placing dams on rivers and what mitigative actions would be needed. Even if this was not the case, the detailed analyses on the Senegal and Gambia Rivers laid open the suppurating wounds that would occur if mitigation was not undertaken. In both studies, multi-disciplinary teams of hydrologists, modellers, engineers, public health doctors, wildlife and fishery biologists, agronomists and anthropologists/sociologists were employed. The consequences of building these

dams were literally examined under a microscope. The studies fill volumes of reports, not available to the general public – at least not easily available. Hydrological modelling was undertaken; gains and losses of traditional versus irrigated food sources were estimated. Plans existed for artificial floods as a major source of mitigation downstream. In this chapter, with few exceptions, regardless of the dam, one can see similar consequences.

In the case of the Senegal River, a little “white lie” was told that yes, traditional food sources would be lost, but that people should not worry as this would be made up with irrigation. All the while, major constraints to irrigation, while maybe not buried, were certainly not sufficiently highlighted, such as saline groundwater, soil salinization, diseases and the cost/ha of irrigation. Nutritional projections showed irrigation more than making up for the losses of traditional foodstuffs. The environmental assessment was purposely flawed, in the hopes that by justifying these dams there would be more follow-up work. This paved the way for the construction of two dams on the Senegal, the displacement of 10-11,000 people behind the dam, adverse impacts on traditional production systems used by between 500-800,000 people below the dam, conflicts between traditional herders and farmers and the near eruption of a war between Mauritania and Senegal. Most of the people displaced by the dams today are worse off than before due to having both poorer quality and less land and for many there is substantial psychological trauma due to loss of their ancestral lands and the spiritual ties that go with them. Artificial floods in the Senegal River have been inadequate to significantly impact the traditional floodplain production systems and thus the majority of people displaced downstream. With hydropower coming on line, there is concern that the artificial floods will be less, not more and maybe not at all. The rate of land going under irrigation is well behind that which was planned due to financial and technical constraints.

In the case of the Gambia River, after a joint member state/USA team of technicians questioned the prudence of an anti-salinity barrage due to the human and ecological tragedy that might occur, as well as the sighting of a high dam in a World Heritage Site lying along a major fault line, USAID and local politicians brought in a “prostitute consulting firm” to throw the environmental study into disrepute, justifying the politically preferred scenario over what most technicians believed made sense: a high dam located in the Fouta Djallon Mountains of Guinea-Conakry. Senegal did not wish Guinea-Conakry to control its water and wanted the anti-salinity barrage for easy access to the unruly secessionist movement in the Casamance, and well if there was a “*chicken in every pot*”, a dam in each country, maybe plenty of kickbacks for the political elite from the international construction companies. As usual, politics and big bucks overrode common sense, and only behind the scene threats by an environmental legal group to take the U.S. Government to court stopped this action. The high commissioner knew that the Balingho Anti-Salinity Barrage would be a catastrophe. Eight years earlier, when he interviewed the principal author in Washington, D.C. for the position of environmental advisor to the OMVG, he asked what could be done if the fisheries were wiped out as a result of the Balingho Anti-Salinity Barrage. The principal author responded that fish culture was one option, but never to think that this could replace the loss of a dynamic natural fishery. The fact is that Mr. John just did not care at all about the anti-salinity barrage and its impact on thousands of artisanal fishermen or the 43,000 women whose rice fields would be flooded by the barrage or for that matter anything else. There appears to be little morality in dam building and this experience in addition to what the authors could glean from the literature is fairly typical.

Mitigation and planning are not the real issues. Millions have been spent on such studies. The problem is that information generated by these studies by mostly honest technicians has been misused for monetary and political gain, or just plain

ignored. The attitude of the construction firms and donors is, “We don’t live here so if it doesn’t work it’s not our problem; it will be someone else’s”. In fact, many donors moved their staff every two years to avoid having them become too integrated into the local society and too sympathetic to the local people’s needs as opposed to the political needs of the Western donors, which have been anything but long-term, especially during the Cold War when many of these dams were built.

Will things be different in the future? Based on the scandals coming out of the dams just finished, under construction or planned in Lesotho, it appears not (IRN, 2000a; Bond, 2002; Hanlon & Pettifor, 2002; Lekhetho, 2005; Transparency International, 2005). Groups such as the International Rivers Network (IRN), a watchdog group, and previously the World Commission on Dams (WCD) at one time housed in the United Nations Environmental Program (UNEP) in Nairobi, Kenya – but no longer operational, need to continue their vigilance and let the world know where dams are both constructive and destructive. On the positive side, pilot artificial flood programs in the Lake Chad Basin (Loth, 2004) of Cameroon, on the Kafue River, Zambia (DFID, 2002; WWF/Netherlands, 2002), the Zambezi Delta, Mozambique (Beilfuss, 2001; UTIP, 2002; Zambezi Valley News, 2003b), and associated with the Pongolapoort Dam on the Phongolo River, South Africa (Acreman, *et al.*, 2000; Beilfuss, 2001), offer great hope that while bringing on new technologies, the importance of maintaining traditional production systems on floodplains is being recognized in order to maintain both the people and biodiversity of Sub-Saharan Africa. In this light, it is hoped that the Senegal River Basin will become a success story for the sake of its people and their biodiversity.

If the Western donors expect to see anything but anarchy on the African continent, which risks to come back to bite them from behind in the form of

uncontrolled immigration and terrorism in revenge for what many would consider a form of terrorism, destroying the lives of millions of people on the African continent in the name of conservation and development, then they had better start making sure that the results are beneficial to the majority and not the few, in this case the people living off the land and who are directly impacted by dams. Today the majority of local people are worse off than before “development”. Consideration should be given to placing Western donors and dam construction companies on trial for human rights atrocities, but then it appears that despots from the developing world and from behind the former Iron Curtain are easily sent before the tribunal, while the West appears to have some kind of immunity from judging itself. In a modern society within the global age of communications, let us hope that humankind will no longer tolerate short-term gains resulting in long-term disasters. Then again, the authors are a bit idealistic.

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Chapter 8

8.0 MINING TROPICAL COASTAL ZONES, LESSONS FROM THE CARIBBEAN, IMPLICATIONS FOR EAST AFRICAN CORAL REEFS

“For no ecosystem is the impending catastrophe more imminent than for coral reefs, the source of most of the biodiversity, fisheries, sand, tourism, and coastal protection for over a hundred countries. No other habitat on earth is more sensitive to infinitesimal increases in global temperature, nutrients from sewage and fertilizers, agricultural and industrial chemicals, soil eroded from land following deforestation and unsustainable land use, and from raging epidemics of new emerging diseases” (Goreau, 2002).

This chapter emphasizes the principal author’s experience in dealing with land-based pollution, but also highlights other factors jeopardizing coral reefs. Land-based pollution can be pinpointed and dealt with using modern technologies such as soil conservation and appropriate sewage treatment and disposal. This chapter goes into great detail in trying to sensitize the reader to the sources of this pollution, its impact on coral reefs and other nearshore ecosystems, and how to deal with this problem.

The causes of global coral reef degradation are discussed and related to the East African Coast, where the majority of Sub-Saharan Africa’s colonial “hermatypic” coral reefs are found. Special emphasis is placed on lessons to be learned from the Caribbean region, especially as it relates to appropriate sewage (brown and gray water) technology believed to be a major cause of reef degradation from nutrient pollution.

The Caribbean islands are microcosms of what is happening on the continents of planet earth, many being over-populated with natural systems mostly converted to agriculture, which is often practiced on steep slopes, and the nearshore waters acting as trash receptacles for the wastes created by humans on the land (urban and industrial sewage, sediment, pesticides, fertilizers, solid wastes, etc.). Analyzing these islands, in essence is like shrinking the African continent and placing it under a microscope, allowing one to see the big picture of what is going right and wrong with development. The advantage East Africa has over the Caribbean islands is that much of its coastal zone is relatively undeveloped with low human populations, and thus in a semi-virgin state, which is where the Caribbean was back in the 1960s and early 1970s. Thus, East Africa has the potential to learn from the mistakes of others and choose a path of appropriate development that will provide long-term economic returns for the region, while protecting the unique biodiversity of its coral reefs, associated grass beds and mangrove swamps.

8.1 INTRODUCTION

This chapter is mainly concerned with the East Coast of Africa, where colonial “hermatypic” coral reefs are found, from the Red Sea off Egypt to Sodwana Bay off South Africa, the furthest south that colonial coral reefs are found in the western Indian Ocean (East Africa and south-western Indian Ocean). On the West Coast of Africa, little or no colonial coral reef is found due to nutrient rich cold-water upwellings caused by currents linked to strong offshore winds such as the Harmatans. Here one finds rocky outcrops along the coast, rich in fish life, covered by non-colonial “ahermatypic” corals that thrive in these nutrient rich conditions.

In reality, this chapter applies to all tropical areas of the world where coral reefs are found and where development on the land from tourism, urbanization, industry and agriculture jeopardizes these unique ecosystems. In many cases, what is happening is out of ignorance, but in some cases, it is out of greed. One hundred years ago, the earth's coral reefs and associated fish populations were healthy. This is not the case at the beginning of the 21st century (Wilkinson, 2004).

Coastal tourism, as currently being undertaken in much of the tropics, is not sustainable. The number of international tourists worldwide grew from 170 to 635 million between 1971 and 1998, while the amount spent by the tourists soared from US\$ 21 billion to US\$ 439 billion. By 2020, the World Tourism Organisation predicts, 1.5 billion international tourists will spend US\$ 2 trillion a year – over US\$ 5 billion/day. However, as is discussed in this chapter, sewage, solid waste, habitat destruction, poorly placed hotels too close to beach fronts, highly fertilized golf courses next to the sea, artificially created harbors, breakwaters and jetties, a demand for seafood beyond the sustainable capacity of the area (GESAMP, 2001), boat anchors and uncontrolled SCUBA diving, etc. can adversely impact coral reefs and related habitat.

For many reasons, African coral reefs and coral reefs across the tropical world are in jeopardy, as much as if not more than the world's tropical forests. However, because the average person will never dive and see these "underwater forests" and their associated "wildlife" and because few people have a historical reference point of seeing virgin reef being "raped" by development, there does not seem to be a great sense of urgency felt by the international conservation community over the plight of the world's reefs. However, in the last few years there does appear to be a heightened awareness.

For the moment, East Africa is fortunate with regards to its coral reefs. Other than in a few highly developed areas such as Sharm el Sheikh, Mombassa, Dar es Salaam, Pemba, Maputo, etc. the coasts are relatively virgin. If greed can be controlled, there is enough knowledge, as with dams (see Chapter 7) to allow development to unfold without destroying these reefs and/or to identify key reef areas in need of protection and limit development in their watersheds so that they and their unique biodiversity may be conserved for humankind, especially for the coastal people who gain their livelihoods from the sea. It is hoped that this chapter adds to the knowledge necessary to achieve these goals.

The latest United Nations Environmental Program (UNEP) global estimate for the area currently covered by coral reefs worldwide is 284,300 km² (109,768 mi²). The atlas identifies 80 countries and/or geographical regions where coral reefs may be found - the greatest concentration is to be found around Indonesia, closely followed by Australia. In general terms, Africa is identified as hosting around 7.5% of the overall total (Spalding, Ravilious & Green, 2001), amounting to approximately 21,323 km² (8,232 mi²) of coral reefs out of the global total. Contributing to this total from other parts of the world are the Asia/Pacific (77.5% of global total), Europe (7.1%), Latin America and Caribbean (5.4%) and North America (2.5%) (Spalding, *et al.*, 2001). Leakey and Lewin (1995) argue that

“in the oceans, reef communities have been transformed periodically, as existing organisms were wiped out, coinciding in 4 cases with the major extinction crises (see Chapter 1). After each devastation, reefs reappeared, sometimes calcareous algae dominating, sometimes bryozoans, sometimes mollusks and sometimes corals. The coral reefs with which we are familiar are simply the temporary inhabitants of that adaptive zone”.

This chapter shows that as forests on land, coral reefs are being rapidly forced into extinction and converted to less biologically diverse algal reefs “at the hand of humans”. The question is, how serious is this and are humans, both in the sea

and on land, major players in the ‘6th extinction’ (see Chapter 1, Section 1.3.2, Man and the Extinction of Pleistocene Mega-fauna)?

The principal author has been diving and exploring the underwater world for over 40 years. His introduction to the underwater world began at a very young age. By 1963, when the principal author began diving, the Aqualung or SCUBA (Self-Contained Underwater Breathing Apparatus), developed by Emile Gagnon and popularized by Jacques Cousteau, was about 20 years old. The principal author made his first dive on tropical coral reefs in 1968 off Big Pine Key, Florida.

The coral reefs were virgin and the keys still relatively undeveloped in the late 1960s. After completing a M.S. that among other things looked at sport fishing on artificial reefs, as a Peace Corps volunteer from 1973-75 and then with the USEPA¹⁸⁶ in Louisiana from 1975-1977, the principal author dived at Tulum, in the Yucatan of Mexico, at Ambergris Cay, Belize – the second largest barrier reef in the world after the Great Barrier Reef of Australia, at Cayos Zapatios, Guatemala, at Roatan Island off Honduras (Figure 8.1), at the *Isla del Maize*, Nicaragua, and off Grand Cayman Island. These reefs were virgin, being found along the undeveloped coasts and fishing villages of Central America with low human populations, and all at the time had healthy coral ecosystems. When the principal author dived Grand Cayman Island in 1977, “build-out” development was just beginning as this peaceful island was being turned into one big condominium complex, and people were talking of pollution from sewage already affecting underwater visibility. There was talk of deep well injection of sewage. During this period, from 1969-1977, an underwater photographic archive was developed of what the principal author observed. The principal author then moved onto the African continent from 1977-1987 where he dived extensively off the coast of Senegal, West Africa, mainly off Dakar’s Cape Verte Peninsula.

¹⁸⁶ U.S. Environmental Protection Agency (USEPA), EMSL (Environmental Support Laboratory)/Las Vegas Baton Rouge, Louisiana

From 1988 through 1989, the principal author served as a regional environmental advisor to USAID in the Caribbean, covering all major islands on which the U.S. government had development activities plus British Honduras/Belize and Guyana. The environmental movement had caught on worldwide, and this seemed an ideal opportunity to get involved in the establishment of marine parks off the islands of the Caribbean and to continue developing an underwater photographic archive.

The principal author was based out of Bridgetown, Barbados, one of the most developed islands in the Caribbean, with an economy based on sugarcane, rum and tourism, and suffering from major coral reef degradation. One of the principal author's first assignments was to assess a wastewater treatment plant being designed by the U.S. government on the island of Grenada. Grenada had recently been invaded to save the island and the western hemisphere from communism. Grenada was a small place where they produced bananas, sugarcane and made a drink called *Ron Avec Bois Bande*, containing the bark or root of bushes (*Roupale montana* and *Chione spp.*), that acts as an aphrodisiac with potential pharmaceutical value (Johnson, DeGeorges, Jackson, Talbot & Teytaud, 1988).

As America's environmental movement had begun in the early 1970s due to rivers and streams being polluted with human and industrial wastes, the principal author had some experience in this field, having worked from 1975-1982 for an environmental engineering firm with contracts to conduct sewage treatment environmental impact statements in Region IV (southeastern USA) of the USEPA (U.S. Environmental Protection Agency)¹⁸⁷.

Because of his long-term diving experience, by then about 25 years, he had a historical reference point as to what healthy coral looked like, something very few people had or thought about at the time. In fact, he had never seen degraded coral

¹⁸⁷ USEPA Region 4, Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW, Atlanta, Georgia 30303-3104, www.epa.gov/region4

reef, since prior to 1988 it had been virtually non-existent in the areas he had dived. What he was about to encounter was a shock! The chosen site for the treatment plant was Grande Anse Beach, a beautiful half-moon bay, whose watershed contained among others a Holiday Inn Hotel - an American icon - and a medical school attended by many Americans who could not get into a U.S. school. “Clint Eastwood” rescued the medical students from the communist rebels in a 1986 movie *Heartbreak Ridge* made about the invasion of Grenada by the U.S. Military in the early 1980s to save the western hemisphere from communism. As a result, the U.S. was probably politically indebted to Grenada from this invasion over its sovereignty (DeGeorges, 1989a).

People were complaining of eye, ear and skin infections from swimming in the water along Grand Anse. Most building structures within the watershed were on septic tanks, good at eliminating organic material but not very effective at eliminating nutrients or viruses.

On arriving, the principal author walked out onto the beach expecting to see signs of organic pollution from malfunctioning septic tanks. However, the water was clear and blue, as one would expect of most tropical waters. There were no obvious signs of organic pollution, oxygen depleted, discolored and smelly water or maybe even some dead fish. Swimming out from shore, he came upon the coral reef that was virtually invisible, smothered in epiphytic algae (benthic) – mostly dead reef (Figure 8.2).

This appeared to be a case of nutrient pollution, which allowed algae to out compete the corals for space. The existing treatment systems were adequate enough to eliminate organic matter, but the nutrients were either leaching in through the groundwater in the case of the septic systems and/or being discharged directly.

Ecologically, the discharge of nutrients into the bay was resulting in the coral die-off, which the principal author had observed. Linked to nutrient pollution was an epiphytic algae that like a blanket was smothering the corals, causing the corals' death. The net result was the collapse of an entire ecosystem: the fishes' habitat! The principal author had no quantitative water quality data to backup his hypotheses. It was also obvious that both the existing systems and the planned secondary treatment plant by the U.S. government with a short outfall would be inadequate to deal with both environmental and public health issues.

Upon returning to his office in Barbados, a fax (pre-email days) was sent to his supervisor¹⁸⁸ in Washington, D.C. who was responsible for environmental issues in the Caribbean and Latin America. The fax stated that the US\$ 100,000 spent on designing the treatment plant was wasted and that less treatment, not more treatment, was needed. Money would have to be invested in minimal "preliminary" treatment and a long outfall to get the discharged effluent as far away as possible from the ecologically sensitive systems (e.g., corals and grass beds), letting the dilutional capacity of the open sea bring the discharged effluent to safe background levels. His supervisor's initial reaction was disbelief that less not more treatment was needed; he started questioning if he had hired the right person for the job. USAID and many donors often expect consultants to justify their plans, not call them into question. One of the problems with foreign aid and "development" is that employees advance within the system for justifying the expenditure of money, not doing what is right.

Fortunately, in Barbados, the principal author worked with a civil engineer who was responsible for the Grand Anse sewage works¹⁸⁹ and who was open to discussion. The principal author was also able to identify Dr. Wayne Hunte of Bellairs Research Laboratory in Holetown, Barbados, associated with McGill

¹⁸⁸ Jim Hester

¹⁸⁹ Jim Baird

University of Canada and the University of the West Indies. Dr. Hunte, a Bajan (from Barbados), had been undertaking water quality analyses both in Barbados, which had also suffered major reef damage from sewage (e.g., all fringing reef gone, major problems with beach erosion), and Grenada, among others. He was one of the few scientists at the time who understood the problem.¹⁹⁰

At a meeting, the principal author's observations were discussed. Dr. Hunte backed the principal author's conclusions and had water quality data to support them. In collaboration with Bellairs, the civil engineer redesigned the project, putting an emphasis on oceanographic studies and modeling the dilution to background levels of preliminarily treated sewage based on a long ocean outfall. The principal author never saw the final outcome of construction.¹⁹¹

Nevertheless, over the next two years, the principal author dived at most of the major islands in the Caribbean and at Belize. The principal author undertook surveys of pesticides and fertilizer use on the islands and investigated existing and planned marine parks. The following summarizes his experiences in the Caribbean and how they relate to the Indian Ocean along the eastern side of the African continent in the development of coastal tourism. Personal observations on coral reef health in both the Caribbean and the African East Coast are provided. General conclusions drawn are:

¹⁹⁰Dr. Terry Done, of the Australian Institute of Marine Science (AIMS) was another person the author met in the early 1990s at a marine symposium in Mombassa, Kenya, who seemed to share a similar understanding. The author approached scientists from the Smithsonian Institute in the 1980s but they were unaware of what was going on, as they were focused on very narrow research topics.

¹⁹¹In Table 8.7, the Point Salines Outfall appears to be the system that he worked on, demonstrating that USAID brought this process to conclusion.

- Land-based pollution is a primary cause of coral reef degradation. At the September 1988 Regional Seas Conference sponsored by UNEP in Mexico City, land-based pollution was considered the number one environmental problem affecting the Caribbean Basin;
- This is primarily from nutrient enrichment of nearshore marine waters associated with improperly or untreated domestic sewage and gray water originating from major urban areas and from tourism developments;
- The world's tropical waters are nutrient poor and ecologically thrown out of balance by this enrichment, resulting in coral reef ecosystems collapsing as a result of being smothered by epiphytic algae (benthic macro-algae), which prevents zooxanthellae (a symbiotic algae living within the coral polyp providing the coral with food and giving it color) from photosynthesizing, and the polyps from filtering micro-organisms out of the water – thus cutting off the coral's food supply and starving it to death;
- Believed to be secondary in importance in causing coastal degradation are pollutants associated with agricultural runoff including sediment, pesticides and fertilizers, often from ill-conceived donor policies (e.g., subsidized bananas in the Caribbean);
- The loss of coral reef sets off a cycle of beach erosion as the source of sand, corals, is dead (corals breaking down gradually over time provide a major source of sand along with coralline algae), and because of lost protection from wave and storm action by the collapsing reef. This along with declining artisanal fisheries from habitat loss and eye, ear and skin infections by swimmers has the net result of diminishing tourism attractions;
- Western waste treatment technologies solve neither ecological (e.g., up to secondary treatment removes primarily biological oxygen

demand/BOD but few nutrients) nor public health needs (e.g., secondary treatment as commonly used);

- High tech tertiary treatment that removes significant amounts of nutrients suffers along with secondary treatment from high operation and maintenance levels (cost of maintenance, availability of spare parts, qualified technicians, who are even hard to find in the developed world) and as a result is rarely operated up to design capacity;
- One viral particle can make a person sick. Normally, sewer water dumped at sea should not come in contact with a person for at least two days; this period of time allows for die-off from ultraviolet radiation;
- Land-based discharge of sewage requires secondary treatment and viral aerosols are still an issue (e.g., spray irrigation of golf courses), which is maintained with difficulty in developing countries. On islands, land (e.g., overland flow, crops) is a major constraint as land availability can be an issue, while during the rainy season major holding ponds are needed;
- Solutions such as long outfalls with preliminary treatment, possibly land-based treatment and deep (not shallow) well injection, exist but are ignored by governments and developers, mostly out of ignorance, in favor of simple septic systems and secondary treatment package plants with short outfalls. A recent report by Sealy (2002) of the Caribbean Water and Wastewater Association (CWWA) confirms this to still be the case;
- Once degraded, due to its slow growth rate, the coral reef system could take 100s if not 1,000s of years to come back, even if the source of pollution is removed and transplants of healthy coral are put into place;

- Most marine parks fail to deal with the major issue of land-based pollution and unless situated in a pristine watershed continue to degrade;
- Local artisanal fishermen are victims of degraded coral habitat by developers rather than the cause of the problem due to engaging in over-fishing and/or destructive fishing methods. While there is an increased need to work with artisanal fishermen to sustainably manage their fishery (e.g., breaking up the coastline/reef into fisher community-managed zones), they are not the major problem, which is coastal tourism as currently undertaken and land-based pollution in general;
- As in African parks and safari hunting areas with traditional hunters and pastoralists, hotel owners and dive operators often come into conflict with local fishermen, trying to stop access to areas that their families have fished for 100s of years in favor of exclusive high-paying clientele – SCUBA divers. This is analogous to wealthy tourists visiting Africa's parks and hunting blocks, while the local community is excluded from the lands of their ancestors;
- Coastal tourism in the tropics negatively impacts local cultures, often turning the sons and daughters of fishermen into drug dealers, gigolos and prostitutes from the immoral Western values imported by tourists;¹⁹²
- Most governments and NGOs fail to recognize the problem of land-based pollution, assuming that marine biodiversity can be protected by declaring an area a park, by putting up marker and mooring buoys, banning fishing and educating sport divers not to touch the corals. The

¹⁹² This is readily observable in many of the coastal tourism areas of Sub-Saharan Africa. Major steps are being taken by the Kenyan government and tourism industry to stop the sale of children or children selling themselves to tourists for sex in Kenya's coastal resorts (Majtenyi, 2005), a reflection of the extreme level of poverty that exists in the area and across the subcontinent.

problem is orders of magnitude more complex than this, but this simplified approach brings in lots of money to the NGOs from donors and from publicity directed at an ignorant, uninformed public contributing to the wrong cause;

- Other issues include damage by divers (education critical) and boat anchors (permanent moorings, or the dive boat floating with the divers' bubbles or a diver-towed buoy can solve this), dredging to create harbors, opening lagoons as harbors, filling in salt ponds/lagoons for housing developments, elimination of unsightly mangroves, unregulated harvest of coral and sea life for the aquarium trade, location of tourist lodges and lights too close to the beach affecting turtle nesting and sex ratios (the closer the eggs are laid to the waterline, the lower the temperatures and the more males are among hatchlings), as well as survival of the hatchlings (driven by lights from tourist hotels inland to their death); and
- Global issues such as planetary and ocean warming, the breakdown in the ozone layer, etc. have become increasingly important since the late 1990s in determining coral reef health, but often detract from people actually doing something about issues that they can physically address – these issues have to be dealt with at a global level by states such as through the Kyoto Protocol to the United Nations Framework Convention On Climate Change that addresses the burning of fossil fuels and resulting greenhouse gas (GHG) emissions. There are still major debates about long-term climate changes and to what degree they have been accelerated by humans as opposed to being part of a natural cycle. However, one thing is apparent: recent but temporary increases in ocean temperatures have resulted in major coral die-off and degradation.

Ultimately, the tropical coastal zones' long-term economic potential is auctioned off for short-term gains, mostly out of ignorance. If a proper understanding existed by temperate climate developers and tropical governments, the cost of doing it right is likely the same as doing it wrong, especially if developers and governments pooled their resources. However, rectifying the problem once it is recognized can be more expensive. The following sums up fairly well what the principal author has observed over the last 40 years of diving.

"The coral reef crisis is almost certainly the result of complex and synergistic interactions among local-scale human-imposed stresses and global-scale climatic stresses. Both can produce direct and indirect chronic (long-term events such as land-based pollution and now ocean warming), and acute (short-term events that cause rapid damage on a reef such as storms and dredging, short-term but significant increases in water temperatures) stresses, leaving few, if any, parts of the ocean truly hospitable for healthy coral reef communities. Documented human stresses include increased nutrient and sediment loading, direct destruction, coastal habitat modification, contamination, and the very important chronic indirect effects of over-fishing. The major climate change factor that is becoming increasingly important for coral reefs is rising ocean temperatures, which have been implicated in chronic stress and disease epidemics, as well as in the occurrence of mass coral bleaching episodes. Also of concern are the effects of increasing atmospheric carbon dioxide (CO_2) on ocean chemistry, which can inhibit calcification—the deposition of the calcium carbonate minerals that are the structural building materials of coral reefs. Coral reef communities usually recover from acute physical damage or coral mortality if chronic environmental stresses (such as reduced water quality) are weak, and if the acute stresses are not strong or overly frequent. Coral reefs also withstand chronic stresses in the absence of acute stresses. The combination of acute and chronic stress, however, often results in the replacement of the coral reef community by seaweeds or some other non-reef system...Whereas remote oceanic reefs will be affected primarily by climate change, reefs close to human populations will continue to be affected by combinations of additional stresses (e.g., reduced water quality, physical damage, and over harvesting) that must be considered together to be understood and managed" (Buddemeier, Kleypas & Aronson, 2004).

A good example of the problems facing coral reefs is provided in the following set of photos taken over time by the US Geological Survey on one coral head from the Florida Keys (Figure 8.3).

8.2 GENERAL

Coral reefs, associated sea grass and mangrove habitats are among the most diverse and valuable ecosystems on earth. These reef systems are storehouses of biological diversity, providing economic and environmental services to millions of people from shoreline protection, food, economic revenue from fishing, recreation, tourism and pharmaceuticals. Coral reef organisms have evolved over the past 40-55 million years with present-day reefs having accumulated during the last 5,000 (Ecological Society of America, 2000) to 10,000 years (Buddemeier, *et al.*, 2004) of the current interglacial period (the Holocene epoch). Coral reefs are one of the oldest continuous environments on earth (Ecological Society of America, 2000). “The modern reef community is the living veneer over these limestone accumulations that may be tens of meters thick” (Buddemeier, *et al.*, 2004).

The net primary productivity of coral reefs is approximately 2,500 grams of carbon/m²/year, compared to 2,200 grams of carbon/m²/year for tropical forests and only 125 grams of carbon/m²/year in the open ocean (WRI, 2002).

According to one estimate, these “rainforests of the sea” may provide goods and services valued from a high of US\$ 375 billion each year (U.S. Coral Reef Task Force, 2000; Costanza, d’Arge, de Groot, Farbar, Grasso, Hannon, Limburg, Naeem, O’Neill, Parner, Raskin, Sutton & van den Belt, 1997 *In:* Evans, 2002; Wilkinson, 2002) to a low of US\$ 30 billion (Buddemeier, *et al.*, 2004) – an

amazing figure for an ecosystem that covers less than 1% of the earth's surface (U.S. Coral Reef Task Force, 2000; Costanza, *et al.*, 1997 *In:* Evans, 2002). Approximately 500 million people in tropical countries have some dependence on coral reefs (Wilkinson, 2002). The reefs of Florida are valued at US\$ 1.6 billion per year from tourism, while the Great Barrier Reef in Queensland is valued at US\$ 1.5 billion. No such analyses exist for the Indian Ocean/East Africa (CORDIO, 1999).

8.2.1 Distribution of Coral Reefs

Colonial coral reefs are found within a 7,770 km (3,000 mi) wide belt bounded by the Tropics of Cancer and Capricorn, respectively 23.5° north and south of the equator.

8.2.2 Biodiversity of Coral Reefs

Reef-building (or hermatypic) corals are of the order Scleractinia in the class Anthozoa of the phylum Cnidaria. Approximately 6,000 species of Anthozoans exist, all of them marine (Turner, 2002). Reefs support more species per unit area than any other marine ecosystem, including about 4,000 documented species of fish, 800 species of hard corals and 100s of other species. Scientists estimate that there may be another 1 to 8 million undiscovered coral reef species. In many ways, coral reefs rival and surpass tropical rainforests in their biological diversity and complexity (Pomerance, 1999; Evans, 2002). These tropical marine communities occupy less than 1% of the ocean floor, but represent some of the most biologically diverse ecosystems on earth, providing critical habitat to approximately 25% of marine species (Ecological Society of America, 2000; Buddemeier, *et al.*, 2004) from 32 of the world's 33 animal phyla live – four times the number of animal phyla found in tropical rain forests.

This biodiversity may be a source of natural products derived from reef dwelling organisms. Many pharmaceuticals are now under development from coral reef animals and plants as possible cures for cancer, arthritis, human bacterial infections, viruses and other diseases. Coral reef ecosystems are considered a key source of natural compounds for new medicines for the 21st century (Pomerance, 1999; Evans, 2002).

The two major centers of hermatypic coral reefs are the Indo-Pacific and the Atlantic. The heart of coral reef biodiversity is in Southeast Asia in what is known as the "coral triangle". The Indo-Pacific supports 85% of the world's coral reefs and a similar level of biodiversity (Veron, 1995 *In:* Buddemeier, *et al.*, 2004). This center of biodiversity is found on the world map by drawing a triangle encompassing New Guinea, the southern tip of Sumatra and the Philippines. This area alone contains more than 500 species of reef building corals, compared to only 60 to 70 species found in the Caribbean (Coral Reef Alliance, 2002a). Buddemeier, *et al.* (2004) estimate that the Indo-Pacific, which includes Southeast Asia, has 750 species of reef building corals.

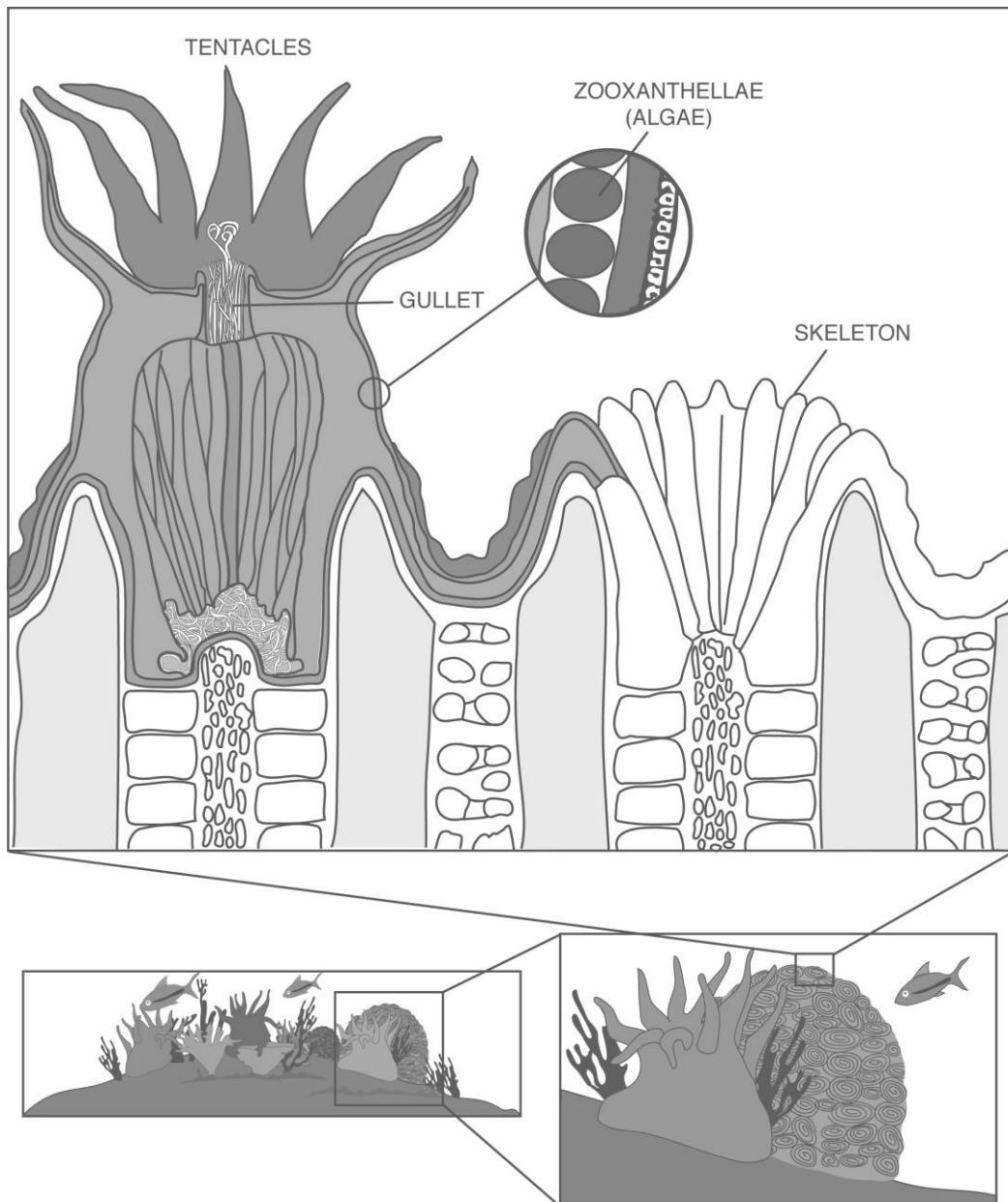
8.2.3 The Dependency of Coral Reef Communities on Other Aquatic Ecosystems

The survival of coral reef communities is strongly tied to a number of aquatic ecosystems and their environmental health. These ecosystems include sea grasses, mangroves and salt ponds (DeGeorges, 1990a). It is estimated that 50% of the world's mangroves have been lost over the last century due to actions by humans (GESAMP, 2001). Coral reefs cannot be seen to exist in isolation of other marine ecosystems. The protection of coral reef communities will require not only a systems approach, but will require a watershed approach if they are to have

a future. “We cannot interfere in one area of the ecosystem without paying due attention in other areas and to the well being of future generations” (John Paul II, 1989 *In:* DeGeorges, 1990a). A study on four barrier atolls on the Belize Barrier Reef found that with the exception of the rainbow parrotfish (*Scarus guacamaia*), most reef fish have no functional dependency on mangrove nurseries, though mangroves can strongly influence the community structure of fish, directly or indirectly. Species of haemulids (e.g., grunts, porkfish), snappers and parrotfish benefited from the extent of nearby mangroves; the standing stock of fishes using mangrove nurseries being considerably greater when there is a reef close to the mangroves. Seagrasses also serve as nursery grounds (Wilkinson, 2004). In addition, seagrasses not only help to stabilize the movement of sand, important to protecting the reefs from sedimentation, but also are extremely important as grazing grounds for herbivorous fish and as nursery grounds (Gilmore, 1987; Zieman, 1982 both *In:* DeGeorges, 1990a). Among others, fishes from the families of Pomadasytidae, Lutjanidae and Holocentridae find shelter on the reef during the day and move into the adjacent grass beds at night to feed. The seagrasses also serve as an important food source for marine turtles including the green turtle (*Chelonia mydas*) and the loggerhead turtle (*Caretta caretta*) (W.A.T.S. 1983 *In:* DeGeorges, 1990a).

8.2.4 The Relationship between Coral Reefs and Zooxanthellae

The survival of hermatypic or colonial reef-building corals depends on a symbiotic relationship between coral polyps and unicellular brown algae called zooxanthellae (Figure 8.4). This is described and diagramed in Goreau, Goreau and Goreau (1979) and Buddemeier, *et al.* (2004).



Source: Buddemeier, Kleypas & Aronson (2004) with permission, Pew Center on Global Climate Change.

Figure 8.4: Morphology of typical reef-building coral

The zooxanthellae is a dinoflagellate, which lives inside the coral polyp. It is different from most of its group, which is planktonic (including the infamous red tide which can result in massive fish kills) and important to the aquatic food chain. The zooxanthellae give many of the corals their color. They are also found

in other invertebrates such as giant clams (*Tridacna* spp.) and many nudibranchs (Sea Slug Forum, 2004).

Approximately 94-98% of all organic carbon produced by the zooxanthellae during photosynthesis leaks out of the algal cells to be used as a food source by the coral polyp (Veron, 1986 *In: DeGeorges, 1990a*). The production of carbon greatly increases the rate of reef building by increasing the rate of deposition of the corals' limestone skeleton (CaCO_3). This light enhanced rate of calcification enables the coral reefs to grow faster than they are eroded by the action of the sea and eroding organisms (e.g., parrotfish). It is the major reason why light and thus depth are limiting factors to colonial corals. Zooxanthellae provide the colonial corals with 98% of their total food requirements (Veron, 1986 *In: DeGeorges, 1990a*; Allen & Steene, 1996), the rest being filtered from the water column (Veron, 1986 *In: DeGeorges, 1990a*).

In turn, the zooxanthellae extract phosphates and nitrates from the corals' waste products, thus enabling an entire ecosystem to develop in what would appear to be an unproductive nutrient poor system. The efficient and rapid recycling of these nutrients results in the tropical world's coral reefs being one of the most productive natural and diverse communities, marine or terrestrial (Wood, Ferguson & Johannes, 1975 *In: DeGeorges, 1990a*).

"It was once believed that all zooxanthellae were the same species, *Symbiodinium microadriaticum*. However, recently, zooxanthellae of various corals have been found to belong to at least 10 different algal taxa. Interestingly, zooxanthellae found in closely related coral species are not necessarily closely related themselves, and zooxanthellae found in distantly related coral species may, in fact, be closely related. This suggests that coral and zooxanthellae evolution did not occur in permanently associated lineages. Rather, symbiotic recombination probably shaped the evolutionary process, allowing both symbionts to evolve separately" (Turner 2002).

Ahermatypic or non-colonial corals do not have this relationship. Ahermatypic corals are not limited by light, growing at great depths and obtaining all of their nutrition from the capture of plankton/microorganisms.

8.2.5 Coral Reefs and Related Fisheries

An estimated 25% of the world's fish species are, in some way, dependent on coral reefs that serve as feeding, spawning and nursery grounds and provide shelter (CORDIO, 1999).

"Coral reefs are one of the most important food reservoirs in the ocean, supporting both subsistence and commercial reef fisheries. Although they cover only about 0.2% of the ocean¹⁹³, coral reefs provide habitat for about 10% of the fish caught for human consumption, and they are the spawning grounds for 15% of the world's fish catch. In some areas in the Pacific, reef-based fish and other organisms account for 50% of local daily protein intake. In the Caribbean, over one-half (50%) of the known species of reef-related fish are commercially marketed. For instance, in 1995, the commercial value of domestically (USA) harvested reef fish and shellfish was estimated to exceed US\$ 79.5 million. In the Florida Keys, the commercial fishing industry contributed US\$ 17 million to the local economy. Imports into the U.S. of reef fish for consumption or the aquarium fish trade amount to an additional US\$ 25-50 million annually" (U.S. Dept. of State 2001).

Coral reef fisheries yield at least 10% of the world's fish catches (CORDIO, 1999), which amounts to at least 6 million metric tons of fish catches annually, excluding local sustenance fisheries. Reefs provide 25% of the fish catch in developing countries and employment for millions of fishers (Pomerance, 1999; CORDIO, 1999). Wilkinson (2004) estimates the total global annual fishery yield

¹⁹³ Note: The Ecological Society of America (2000) and Wilkinson (2004) say 1 % of the ocean floor.

from coral reefs is most likely 1.4–4.2 million tones, only 2–5% of global fisheries catches.

“Other ecosystems like up-welling areas produce 50 times more fish than coral reefs. However, reefs do support important fisheries for tropical people with yields ranging from 0.5 to 50 tons/km/year. The catch on remote reefs in the Indian Ocean is around 60 kg/day/person, whereas heavily fished reefs produce less than 3 kg/day/person” (Wilkinson, 2004).

Fish are an important source of animal protein for people. They provide about one-sixth (17%) of the animal protein intake of people worldwide and are the primary source of protein for about 1 billion people in developing countries. Fisheries are under pressure from over-fishing and in nearshore waters from degraded habitat. Over-fishing is occurring because of excessive harvesting capacity in the world's fishing industry. According to one estimate, the level of fish harvest is 30-40% greater than the sustainable level. As a result, about 28% of the world's most important marine fish species have been fished near to or beyond the maximum sustainable yield (GEF, 2002).

Assessments carried out in 1997 and 1998 showed that a majority of the world's coral reefs were severely over-fished and that most high-value organisms were missing (CORDIO, 1999).

As human populations in and around coral reefs increase,

“coral reefs throughout the world are being degraded rapidly, especially in developing countries, and there are widespread concerns about over-exploitation of reef fisheries. As more and more fishers, both traditional and non-traditional, attempt to take fish from reefs, there is an increasing use of destructive fishing methods such as bombs and poisons; this process is known as ‘Malthusian over-fishing’. Another major problem is the growing

international trade for live reef fish for the Chinese restaurant trade. These fish are often caught by mobile fleets using cyanide, and targeting species that are territorial on reefs. This leads to serial depletion of large coral reef fishes, notably the humphead wrasse (Labridae), groupers (Serranidae) and snappers (Lutjanidae), and to reefs devastated by the cyanide poisoning...there is little chance of ‘sustainable reef fisheries’ when the pressures keep mounting exponentially and the likely future scenario is total depletion of many stocks with localized extinctions of some species” (Wilkinson, 2004).

Wilkinson (2004) notes the following.

“Fisheries management methods introduced and enforced by traditional or indigenous management and corroborated by national and international institutions and policies are more likely to succeed. These include strict species-specific management of stocks; application of quotas or legal sizes of fish; reductions in human fishing effort; restrictions on fishing gear, size of fish taken, times and space; and prohibition of methods that are destructive to habitats and small fish. Nevertheless, even fairly low levels of fishing with non-destructive gear will reduce top-level carnivores, and closures in time and space are needed to maintain their populations. Closed areas may range from reefs that are too dangerous to fish, to highly managed tourist or enforced MPAs (marine protected areas)”.

This is similar to rotational hunting, where once the catch per unit of effort falls off, an area is abandoned until stocks decrease, as used by many traditional societies (see Chapter 2, Section 2.1.5, Mobility as a Means of Managing Natural Resources and Chapter 11, Section 11.11.6, Eco-genocide in Southeastern Cameroon, the forest people and the *Dobi Dobi*, more parks and protected areas). It also goes along with the concept of integrating traditional management systems with modern intensive management concepts (see Chapter 9, Section 9.1, THE CULTURAL DIVIDE and Section 9.7.4.1, Traditional management institutions ignored in favor of Western institutions).

8.2.6 Categories and Structure of Coral Reefs

There are three basic kinds of coral reefs in the Caribbean:

- **Fringing reefs** that grow in shallow waters and border the coast closely or are separated from it by a narrow stretch of water;
- **Barrier reefs** that are separated from land by a lagoon. These reefs grow parallel to the coast and are large and continuous. Barrier reefs also include regions of coral formation that include the zones found in fringing reefs along with patch reefs (small reefs), back reefs (the shoreward side of the reef), as well as bank reefs (reefs that occur on deep bottom irregularities). Coral reefs also include reef flats (the area of the reef not exposed), the reef crest, which runs parallel to the coast and is protected from waves, and a coral terrace (a slope of sand with isolated coral peaks). These features are followed by another coral terrace and a vertical drop into deeper waters; and
- **Atolls** are annular reefs that develop at or near the surface of the sea when islands that are surrounded by reefs subside. Atolls separate a central lagoon and are circular or sub-circular. There are two types of atolls: deep sea atolls that rise from deep sea and those found on the continental shelf (Turner, 2002).

These basic definitions hold true for the western Indian Ocean, including East Africa.

8.2.7 Water Quality and Coral Reefs

8.2.7.1 Temperature

Colonial reef-building (hermatypic) coral reefs are found in tropical waters in which seawater temperatures range from 16-36° C (61-97° F) with an ideal range of 23-25° C (73-77° F) (Smith, 1971 *In:* DeGeorges, 1990a). Veron (1995 *In:* Buddemeier, *et al.*, 2004) and Kleypas, McManus and Meñez (1999 *In:* Buddemeier, *et al.* 2004) place the lower temperature limit of these reef-building corals at 18° C (64° F). While it has long been known that low temperatures limit the existence of coral reefs, it has only recently been appreciated that corals have upper temperature thresholds (Goreau & Hayes, 1994; Pomerance, 1999) as a result of global warming (see Section 8.10.1, Global Ocean Warming and Coral Bleaching). Today, water temperature greatly limits the latitudinal distribution of coral reefs to the world's tropics.

8.2.7.2 Salinity

The average salinity of seawater is 35 parts per thousand (ppt.). Corals can survive in salinity ranges between 25-40 ppt (Smith, 1971 *In:* DeGeorges, 1990a).

8.2.7.3 Light and depth

Because of a symbiotic relationship between corals and a brown algae, zooxanthellae, coral reefs are restricted to depths less than 46 meters (150 feet), the maximum depth at which there is adequate light for photosynthesis. The most vigorous growth of corals is at depths shallower than 27 meters (90 feet) where there is sufficient wave action and current to provide oxygen and food to the coral polyps (Smith, 1971 *In:* DeGeorges, 1990a). The most vigorous reef growth

tends to occur in high-energy zones including the windward side of shorelines and the seaward side of the reef where there is heavy surf action and strong currents are present.

8.2.7.4 Nutrient concentrations

“Coral reefs are the most nutrient-sensitive of all ecosystems. They are overgrown by algae at such low levels of nutrients that no other ecosystem would be affected. Water quality standards based on human health permit nutrient levels hundreds of times too high for corals” (Goreau, 2003a).

“In some coral reefs, the proliferation of benthic algae caused by enhanced nutrient inputs has led to competition with the hard corals, which the corals have lost. Thus, there can be a change in community structure from a hard coral dominated to an algal-dominated system” (GESAMP & ACOPS, 2001). “All reefs near human populations or adjacent to large land masses suffer degradation from nutrient pollution” (Wilkinson, 2004).

Goreau (2003a) supports the “bottom-up theory” that nutrients control the production of marine plants, but that herbivores, by eating some plants preferentially and avoiding others (often because they are toxic or too tough), can influence which epiphytic algae are most abundant. He believes that excessive abundance of epiphytic algae can be controlled by reducing nutrients. This is opposed to the “top-down theory” which he believes is often based on poor science and which blames artisanal fishermen for over-fishing herbivores and the die-off of algal consuming sea urchins. In the principal author’s practical experience, he has come to similar conclusions, namely that a major cause of coral die-off globally has been nutrient pollution.

“The distinctions between the two theories are not just an academic quarrel if they affect practical management issues. Following the wrong paradigm will result in failed efforts at control. Because

bottom-up and top-down theories recommend such different policy prescriptions (stopping fishing versus stopping sewage), effective management of algae on reefs will fail if the factor being controlled is not really the most important one" (Goreau, 2003a).

Groups of individuals such as developers, communities and countries can directly address nutrient pollution specifically and land-based pollution in general, usually at a local level, by looking at appropriate sewage technology and working with small-scale farmers to use appropriate soil conservation and other agricultural practices. Ecosystems are classified in terms of nutrients as being (Goreau, 2003a):

- “Oligotrophic” or low in nutrients;
- “Mesotrophic” or intermediate;
- “Eutrophic” or excessive in nutrients. Eutrophic systems are dominated by fast growing epiphytic or benthic algae; and
- “Hyper-Eutrophic” refers to systems that are overwhelmingly dominated by a few species of the worst weeds (epiphytic algae).

Any aquatic ecosystem will go eutrophic if there are enough nutrients, but the nutrient concentrations that cause a coral reef to go eutrophic are so low that the same levels would be oligotrophic in any other ecosystem. For example, the next most sensitive tropical marine ecosystem, seagrasses, require nutrient levels 20 to 30 times higher than coral reefs before the weedy algae overgrow the seagrasses (Lapointe, Tomasko, & Matzie, 1994 *In:* Goreau, 2003a).

“Since almost all published work on eutrophication is in lakes and cold water bays, the nutrient limits for them are commonly, and incorrectly, applied to coral reefs by many uninformed researchers. Environmental water quality standards are inevitably based on cold and fresh waters, making them at the least irrelevant and at worst dangerous if applied to coral reef ecosystems” (Goreau, 2003a).

Nutrient pollution can result from sewage ("brown water"), wash water ("gray water") and agricultural runoff (fertilizer and natural components of the soils) (DeGeorges, 1990a). Other sources include birds nests, turtle and dolphin enclosures/farms, garbage dumps, fish cannery and abattoir wastes, transport by distant watersheds from rivers as is described below for Belize and for the Amazon and Orinoco Rivers in the southeastern Caribbean, massive rain events such as Hurricane Mitch causing runoff from Honduras to the reefs of Belize and Mexico, and seasonal upwelling (Goreau, 2003a). Assuming that this upwelling and associated high nutrient levels are natural, one would have to hypothesize that where this exists along with corals, the latter have evolved around this phenomenon (e.g., ahermatypic corals off the Cape Verte Peninsula of Senegal), unless land-based pollution sources added to the nutrient concentrations of the upwelling reach critical levels.

As described, coral reefs have evolved to thrive in a nutrient poor system in which nutrients are recycled rapidly through the food chain (Section, 8.2.4, The Relationship between Coral Reefs and Zooxanthellae). In the Eastern Caribbean, the following nutrient concentrations are typical of "non-polluted marine waters" (Bellairs Research Institute, 1989 *In:* DeGeorges, 1990a) (Table 8.1).

In a recent publication of the Caribbean Water and Wastewater Association (CWWA),

"work done by Professor Hunte and others clearly indicates that the coastal waters around Barbados, in particular the west and south coasts (heavily populated by residents and tourists) are nutrient-stressed. The situation is likely the same for many of the other islands in the region. In Barbados, the following ambient marine water quality standards for nutrients have been recommended to protect coral reefs" (Sealy, 2002):

Total nitrogen: 10 µg/l or 0.01 mg/l Total phosphorus: 2.5 µg/l or 0.0025 mg/l

Table 8.1: Background concentration in unpolluted Eastern Caribbean waters

Parameter	ug-at/l & mg/l ¹⁹⁴	ug-at/l & mg/l
Nitrate ($\text{NO}_3 + \text{NO}_2$) as N (Unfiltered)	Coastal Waters (Nearshore) 0.70 & 0.01	Oceanic Waters 0.35 & 0.005
Total Phosphate Phosphorus as P (Unfiltered)	0.10 & 0.003	0.06 & 0.002

(ug-at/l as P) x (0.031) = mg/l as P
 (ug-at/l a N) x (0.014) = mg/l as N

Source: Bellairs Research Institute, 1989 *In: DeGeorges, 1990a* with permission, Bellairs Research Institute.

Although not stated, given the information above, these standards would be ug/l and mg/l as N and P, respectively. According to Sealy¹⁹⁵ (2004), these recommended standards were provided by Dr. Wayne Hunte,¹⁹⁶ the same person who had put together the recommended standards above for the Bellairs Research Institute.

Phosphate standards recommended by the Bellairs Research Institute and CWWA above appear to be Total Phosphate Phosphorus, which is Total filterable + Non-filterable Phosphate (APHA, 1976). CWWA's total nitrogen can mean [Total Nitrogen = Total Kjeldahl Nitrogen = (that is organic nitrogen + ammonia)], or Total Oxidized Nitrogen = [sum of nitrate + nitrite nitrogen] (APHA, 1976) which

¹⁹⁴ ug-at/l = umoles/decimeter = umoles/liter = (mg/l) x (1000 ug/mg) x 1 mole/grams molecular weight (14 for N, 30 for P) x (gms/10⁶ ug) x (10⁶ umoles/mole) = 1000/molecular weight (14 for N, 30 for P) x (mg/l). Thus for example (1000/14) x (0.01 mg/l N) = 0.7 umoles/l = 0.7 ug-at/l. Conversely, [(ug-at/l) x (molecular weight)]/1000 = mg/l.

¹⁹⁵ Dr. Hugh Sealy, engineer, Chairman of the National Commission on Sustainable Development, Barbados and former president of the CWWA, hughsealy@yahoo.com

¹⁹⁶Formerly Director of Bellairs Research Laboratory of McGill University in Holetown, Barbados, currently Pro Vice Chancellor [Research], The University of the West Indies, Cave Hill Campus, pvcresearch@uwhchill.edu.bb

is what Bellairs recommends in Table 8.1. Both would be unfiltered. Dr. Hunte (Sealy, 2002) explains that

“the rationale for inclusion of total nitrogen, total phosphorus and chlorophyll-a is increasing concern that nitrite, nitrate and (ortho) phosphate may be poor indicators of nutrient loading of the coastal zone as they are rapidly removed from the water column by algal assimilation”.

This would appear to indicate that Dr. Hunte was recommending Total Kjeldahl Nitrogen and Total Phosphate Phosphorus standards in 2004.

Lapointe (2004a) provides slightly different estimates of recommended nutrient water quality standards to protect coral reefs based on research primarily in the Florida Keys and Caribbean. These recommended water quality standards appear to be based on the latest research (Table 8.2) (Goreau & Thacker, 1994; Goreau 2003a; Lapointe, 2004a; Lapointe 2004b).

Table 8.2: Recommended ambient nutrient water quality standards in nearshore waters, not to be exceeded: “threshold concentrations” to protect coral reefs from overgrowth of epiphytic algae

Parameter	Not Exceeding mg/l (ppm) (umole/l)
Dissolved Inorganic Nitrogen (DIN) = Dissolved (Filterable) [Nitrate (NO ₃) + NO ₂) + Ammonia] as N	0.014 mg/l (1 umole/l as N) ¹⁹⁷
Soluble Reactive Phosphorus (SRP) = Dissolved (Filterable) Orthophosphate as P	0.003 mg/l (0.1 umole/l as P) ¹⁹⁸

Note: umole/l = ug-at/l.

Source: Goreau & Thacker (1994); Goreau (2003a); Lapointe (2004a) & Lapointe (2004b) with permission, Thomas J. Goreau, PhD, president, Global Coral Reef Alliance.

¹⁹⁷ (umole/l x molecular weight)/1000 = (1 x 14)/1000 = 0.014 mg/l

¹⁹⁸ (0.1 x 30)/1000 = 0.003 mg/l

Dissolved parameters should be filtered through a 0.45 micron Millipore Filter (APHA, 1976; Goreau, 2004a.). Lapointe (2004c) believes that

“Total N and Total P are not the preferred indices as they contain particulate forms of N and P that are unavailable to reef biota (i.e., unreactive). The efficacy of these DIN and SRP thresholds was proven in South Florida when water managers pumped massive amounts of farm runoff through the Everglades into Florida Bay and the Florida Keys National Marine Sanctuary (FKNMS) in the mid-1990s...which led to the demise (38% loss of coral throughout the FKNMS between 1996 and 1999 following the nutrient enrichment event) of the 3rd largest coral reef in the world (only ~ 6% coral cover left)”.

With regards to the differences in nutrient data, Goreau (2004b) comments that algae can take up ammonia, nitrate or nitrite. Normally there is very little nitrite in seawater.

“Nitrate is usually much more abundant than ammonia in sea water, but algae will take up ammonia in preference, and this is the form that is prevalent in sewage. As a result it is very variable, and rapidly taken up. Many oceanographers never measure it, and so tend to under-appreciate its importance to algal nutrition. So available nitrogen basically equals the sum of nitrate and ammonia” (Goreau, 2004b).

“It is important to note that to achieve the recommended ambient standard, even with an effluent discharge standard for nitrogen of 10 mg/l as recommended by CEHI (Caribbean Environmental Health Institute), a dilution factor of at least 1000:1 would have to be achieved in the mixing zone around the outfall diffuser. It would appear that even if tertiary treatment with nutrient removal is used, there may still be elevated nutrient levels, harmful to reefs in the immediate vicinity of the marine outfall. Therefore, careful consideration must be given to outfall location and diffuser design, even with tertiary treated wastewater” (Sealy, 2002).

Nevertheless, waters, which exceed these concentrations due to pollution, can exhibit a number of deleterious effects that can cause demise in the coral reef community (Shinn, 1989 *In:* DeGeorges 1990a). These effects include increased blooms of phytoplankton that decrease light penetration in the surface waters and thus decrease the photosynthetic rate of the zooxanthellae, ultimately reducing coral productivity (Hunte, 1987; 1989; Tomascik & Sander, 1987a; 1987b; Woodley, 1987; Woodley *et al.*, 1987; UNEP, 1988 all *In:* DeGeorges, 1990a; GESAMP, 2001). Reduced light penetration from algal blooms can also negatively impact photosynthesis of marine seagrass beds, also resulting in their demise (GESAMP, 2001).

Probably the most observable deleterious effect has been the smothering of the coral reef by epiphytic algae (benthic macro-algae) that cuts off the light needed by zooxanthellae to photosynthesize and prevents the coral polyps from filtering food out of the surface waters (DeGeorges, 1989b; DeGeorges, 1988a; 1988b; DeGeorges & Ford, 1988; Hunte 1987; 1989; Johnson, *et al.*, 1988; MAB, 1989; O'Callaghan, Woodley & Aiken, 1988; Ward, 1990; Woodley, 1987; Woodley, *et al.*, 1987; WWF, 1986 all *In:* DeGeorges, 1990a; Maragos, 1992 *In:* Thayer, 1992; Goreau 2003a; Lapointe, Barile, Yentsch, Littler, Littler & Kakuk, 2004). With all sources of nutrition cut off, the coral reef dies. Lapointe (2004b) notes an N/P ratio of 10/1 linked to the threshold concentrations in Table 8.2 for macro algae to take over.

Goreau (2003a) believes that “the Caribbean has much lower tides and currents than do islands in the Pacific and Indian Oceans, the water sits around much longer and is less diluted. As a result Caribbean islands are much more vulnerable to eutrophication than those in the Pacific and Indian Oceans for the same nutrient input (except for enclosed lagoons)”. Still the principal author's observations from the Red Sea to Mozambique indicate that similar eutrophication with corresponding high epiphytic algal cover and dead coral in nearshore waters, as in

the Caribbean, correlate directly with the level of human population and thus development within the watersheds draining onto these reefs (see Section 8.12, SUMMARY - PERSONAL OBSERVATIONS OF CORAL REEF DEGRADATION IN AFRICA).

Ultimately, Goreau (2003a) is convinced that the only way to stop algae from taking over coral reefs is to cut off the source of nutrient enrichment. The net result of nutrient enrichment “is to push the system to algae that can't be eaten because they are too toxic, too tough, or very dense rapidly growing turf algae that are too short to be grazed” (Littler & Littler, 2000 *In:* Goreau, 2003a). No fish and urchin algal grazers will be able to stop its spread if the source of nutrient enrichment is not stopped!

Lapointe, *et al.* (2004) recommend multi-faceted approaches to study the impacts of nutrient pollution on coral reefs that include characterization of water column nutrient concentrations, algal tissue analysis for C:N:P (carbon:nitrogen:phosphorous) ratios, and tests of algal physiological responses (growth rate, biomass, Alkaline phosphatase activity-APA)^{199,200} to other

¹⁹⁹ Alkaline phosphatase (APA) is the enzyme that releases orthophosphate from dissolved organic phosphorus (e.g. indication of pollution from sewage and/or agricultural runoff) under alkaline conditions, allowing algae to take it up. Dissolved organic phosphorus is the major source of phosphorus for algae in Jamaica. If there is a lot of organic pollution, one expects to find high levels of APA in attempts to create orthophosphate from dissolved organic phosphorous (Goreau, 2004d). Lapointe (1997) found APA activity was in macrophytic (epiphytic) algae. Goreau's father (Goreau, 1953; 1956) showed that coral reefs were exposed to very high levels of APA 55 years ago, having found the enzyme APA in the epidermis of corals (Goreau, 2004d). “It makes sense that it would be a membrane-bound external enzyme to bind to and hydrolyze external organic phosphorus compounds so that the released orthophosphate can be directly taken up across the cell wall” (Goreau, 2005).

²⁰⁰ Alkaline phosphatase (APA) is an enzyme that is produced in relatively large quantities by planktonic algae in response to low orthophosphate concentration in the environment. Low orthophosphate concentration commonly occurs in the photic zone of eutrophic or even mesotrophic freshwater lakes during the growing season. Therefore, at least during the growing season in productive lakes, it should be possible to find an inverse relationship between the activity of the enzyme, alkaline phosphatase, and the concentration of the product of hydrolysis, orthophosphate - the lower the amount of orthophosphate in lake water, the more alkaline phosphatase would be produced/released by algae (Boavida, Hamza, Ruggiu, & Marques, 1997).

researchers attempting to define ecological effects of land-based nutrient enrichment over space and time.

8.3 “BOTTOM-UP” VERSUS “TOP-DOWN” THEORIES EXPLAINING DEVELOPMENT OF ALGAL REEFS

8.3.1 Sea Urchin Dieback

Much of the support for the “top-down theory” - over-fishing being the cause of epiphytic algae overgrowing and smothering coral reefs, resulting in their death - has come from studies after a disease wiped out almost all long-spined black sea urchins or *Diadema* (*Diadema antillarum*) in the Caribbean in 1983. If *Diadema* controlled epiphytic algae, there should have been a sudden Caribbean-wide algal bloom in 1983. This has been claimed in widely cited papers from Jamaica (Hughes, 1994 *In:* Goreau, 2003a), Panama (Shulman & Robertson, 1996 *In:* Goreau, 2003a), and Curacao (de Ruyter van Steveninck & Bak, 1986 *In:* Goreau, 1993).

“In other parts of the Caribbean, areas with nutrient inputs are algae dominated and areas with low nutrients are low in algae, whether or not *Diadema* or herbivorous fish are present. In many parts of the Caribbean *Diadema* populations have now recovered to dense levels, but wherever there are nutrient inputs *Diadema* are

One would expect something similar in marine conditions. When the dominant form of phosphorus available to algae is dissolved organic phosphorus (little orthophosphate available), increased levels of alkaline phosphatase would be found either in tissue (epiphytic algae, coral, phytoplankton) or the water column, though the latter might be rapidly diluted and difficult to measure, in an attempt to produce more orthophosphate for uptake by the algae. Thus, APA is also a good indicator of organic pollution (e.g., sewage, gray water, agricultural runoff) in marine environments.

completely unable to control algae, except in patches just grazed by dense swarms. When nutrients were low, *Diadema* would hide under corals in the day, and hunt for the few algae at night. Now they sit in the open, fat and lazy, grazing a ring around a centimeter or so wide. Beyond the narrow grazed halo lies dense algae forests that the urchins are unable to control" (Goreau, 2003a).

Lapointe (1997; 2004) states that nutrient availability, not consumption by grazers, is a critical factor regulating growth and reproduction of macro (epiphytic)-algae. Nutrient enrichment (bottom-up controls) triggers proliferation of algal turfs and macro-algae in coral reef environments. "Top-Down" proponents of grazers controlling epiphytic algal cover rarely have nutrient data to back up their conclusions (see Section 8.2.7.4, Nutrient concentrations and Section 8.6.2, Montego Bay, Marine Park or Marine Cemetery? A Lesson For Africa). Wilkinson (2004) seems to sit on the middle of the fence, stating that

"over-fishing and particularly fishing with destructive methods are: threatening the normal functioning of coral reef ecosystems; reducing populations of key reef organisms; lowering coral reef productivity; and, along with pollution, shift the advantage towards macro-algae by removing grazing pressure. These algae smother and out-compete corals".

The Jamaica study measured algae and coral cover of the bottom at a single site and reported that algae took over in 1983. Data in that paper show that the transition was not rapid but linear and gradual over many years and began before 1983. The paper claimed the site had no nutrient inputs, citing a study on long-term change in reefs around Jamaica (Goreau, 1992a *In:* Goreau, 2003a). The site was immediately down current from the single largest source of nitrogen on the island: from rivers and springs draining densely populated agricultural areas in the center of the island. In addition, a large dairy cattle operation right next to the site shoveled all the cow manure into the river every morning, where it swept over the

“nutrient-free” site to the extent that one could smell it in the water. “Algae dominance in Jamaica did not take place suddenly everywhere in 1983, but progressively over a 40-year period from the 1950s to the 1990s, following the growth of local population and tourism at each site” (Goreau, 1992a *In:* Goreau, 2003a). The region for which sea urchin die-off was claimed to be the cause of algae coincidentally underwent strong tourism and population growth in the 1980s. “Furthermore, algae overgrowth of corals took place in deep reefs where *Diadema* had never been present in significant numbers, having been almost entirely confined to shallow back reef areas” (Goreau, 2003a) that is algal growth did not take place just because of the *Diadema* die-off but because of landbased nutrient pollution.

Similarly, Goreau (2003a) describes the Panama study mentioned above as being flawed, assuming no nutrient pollution even though the site was in a lagoon draining a highly populated area with direct discharge of sewage. No water quality data were collected. Fifteen years after the coral die back, Goreau, Tribaldos, Gonzalez-Diaz, Arosomena and Goreau (1997 *In:* Goreau, 2003a) found the out-flow side of the lagoon rich in sewage covered in epiphytic algae, while the inward flowing side with clean ocean water was covered with live coral even thought there were no sea urchins.

Goreau (2003a) also labels the Curacao study as being flawed since the deep reef brown algae had been there before the *Diadema* die-off and regardless, the *Diadema* was only ever found in the shallow reefs. “So widely cited have these flawed studies been, that almost all subsequent authors noting high algae have blamed them on post 1983 lack of sea urchins, even when algae dominance took place up to 20 years later or more than 20 years before” (Goreau, 2003a)!

8.3.2 Over-Fishing of Algal Grazers

Goreau (2003a) also believes that this hypothesis as a key reason for epiphytic algae take-over of coral reefs tends to be flawed. He gives the example of Jamaica where,

“coral reefs near urban areas of Kingston, Jamaica were algae dominated in the 1950s, even though *Diadema* were very abundant. A study of Vieques Island, Puerto Rico, found that algae became dominant around 2000, yet blamed lack of herbivores. But algae dominance took place nearly 20 years after the *Diadema* died (around 1983), and was accompanied by a dramatic INCREASE in algae-eating parrotfish, as would be expected if the herbivores were controlled by algae abundance rather than top-down control”.

In the case study presented in this chapter, The Nature Conservancy (TNC)²⁰¹ blamed the poor artisanal fishermen in Montego Bay for over-fishing algal-grazing fish, resulting in increased algal cover and dead reef.

“The pattern in Jamaica rejects the hypothesis that over-fishing has removed the herbivores. In the 1950s and 1960s when the reefs were already over-fished, they were coral dominated with little or no algae except around the highly polluted Kingston urban area. Fish populations were dominated by dense schools of species that eat other fish or eat coral reef animals such as crabs, shrimps, worms, etc. But as the reefs became algae dominated these foods vanished, and the reef fish became dominated by fish that eat algae, because there was no other food available. So, far from the algae being due to lack of animals to eat them, it seems that abundance of algae have instead caused an INCREASE in the number of fish that eat them, indicating that the fish are under bottom-up control by algae” (Goreau, 2003a).

²⁰¹ The Nature Conservancy, 4245 North Fairfax Drive, Suite 100, Arlington, VA 22203-1606, Tel: (703) 841-5300, comment@tnc.org <http://nature.org/aboutus/>.

Likewise, in the Bahamas, Lapointe, *et al.* (2004) found

“low coral cover (< 2%) co-occurred with high macro-algal cover (>35%) at DIN (Dissolved nitrate + nitrite + ammonium)-enriched reef sites around Norman’s Pond Cay (Waterfall, Patch Reef, North Perry Reef) compared to relatively high coral cover (10–20%) and low macro-algal cover (< 20%) at the lower DIN reef sites (Rainbow Reef, Lang’s Reef). These results support ecological theory that bottom-up control via nutrient enrichment is a primary factor regulating overall biomass and taxonomic assemblages of macro-algae on coral reefs, whereas grazing is more important in controlling relative species composition via dietary preferences”.

“The same pattern is seen in coral reefs all around the Caribbean, Indian Ocean, and Pacific: dense populations of algae-eating fish and sea urchins are found only at sites that have a lot of algae. While diseases and over-fishing can result in removal of herbivores, dense algae populations are found at all sites with nutrient sources, and are very low where these sources are absent, whether or not herbivores are present” (Goreau, 2003a).

The principal author found *Diadema* flourishing on the nutrient polluted, epiphytic algal covered dead reefs of Grand Anse Beach, Grenada in the late 1980s. The only area cleaned of algae, though exposing dead reef, was where *Diadema* were concentrated.

8.3.3 Caribbean Fishermen Victims or Culprits – Lessons for Africa

As for the fishermen, although they are a part of the problem and need to be helped in better managing their marine resources, they are not believed to be the major culprit in the demise of the Caribbean's coral reefs. In fact, it might be argued that they are the victims of insensitive northern temperate climate developers, who lack understanding of how tropical coastal waters function ecologically, thus failing to use appropriate technologies to address sewage and gray water issues. They also tend to use large amounts of fertilizers on lawns and

golf courses that drain onto coral reefs and grass bed ecosystems and have a history of building too close to beaches, which impacts on the sex ratio and survival of sea turtle hatchlings.

Fishing on reefs can be classified into three stages: manageable, ecosystem-over fished and Malthusian-over fished. Fishing with blasting devices and poisons is often associated with the third stage. Supporters of the “top-down” hypothesis believe that over-fishing of grazers or herbivores can lead to the proliferation of epiphytic algae, especially in areas subject to nutrient rich runoff, which stimulates algal growth at the expense of corals and results in a coral algal phase-shift (McManus, Meñez, Kesner-Reyes, Vergara & Ablan, 2002). This, however, will likely occur even without over-fishing if nutrient pollution is a problem (Goreau, 2003a; Lapointe, 2004b; Lapointe *et al.*, 2004), this being the “bottom-up” hypothesis of coral reef degradation. McManus, *et al.* (2002) disagree with Goreau (2003a), stating that cage studies indicate that reduction in herbivory can lead to the proliferation of algae even in the absence of eutrophication. In other words, they believe that removing herbivorous fish such as parrotfish from over-fishing and/or other causes can result in significant increases of epiphytic algae, even without nutrient pollution. A major concern with the widespread coral bleaching associated with the 1997-1998 El Niño event is the likelihood that reefs already stressed by over-fishing and organic pollution may not return to coral dominance after severe bleaching (McManus, *et al.*, 2002).

The principal author tends to support the “bottom-up” hypothesis based on his professional experience. Certainly, kicking fishermen out of marine parks is not the solution, unless this is part of a more holistic approach, which integrates the fishermen into the overall management of the coral reef (e.g., working as dive and glass-bottom boat operators in marine parks or becoming involved in sustainable artisanal and sportfishing outside of the marine parks).

8.4 CORAL REEFS UNDER THREAT

“Some 2.2 billion people, nearly 40% of the world's population, live within 100 km of a coastline. These people exert significant pressures on coastal and marine ecosystems that can adversely affect the ecosystems' integrity and function. These pressures include harvesting of natural resources, such as fish and mangrove forests; infrastructure development; and industrial, agricultural, and household pollution. Coastal habitats or resources that are under severe threats from human activities include mangrove forests, coral reefs, and fisheries” (GEF, 2002).

Other analyses estimate that almost half a billion people, 8% of the total global population, live within 100 kilometers of coral reefs (Bryant, Burke, McManus & Spalding, 1998; U.S. Coral Reef Task Force, 2000), just under 150 million of these people being found along the Indian Ocean (Bryant, *et al.*, 1998).

GESAMP (2001) estimated that 70% of the world's coral reefs were under threat by humans and their actions such as pollution, land reclamation, felling forests, mining, building on coasts, destructive fishing (e.g., poison, explosives or catch-all nets), reef mining and the aquarium and curio trades. This chapter analyzes many of these threats.

The most severe threats to coral reefs stem directly from human activities. These impacts are exacerbated by degradation of the overall marine environment due to global climate change (U.S. Coral Reef Task Force, 2000; Wilkinson, 2004). By 1997, an estimated 11% of the world's reefs had been lost to a variety of human activities including shoreline development, polluted runoff from agricultural and land-use practices, over-harvesting, dynamiting and other destructive fishing over-fishing, poorly located and planned coastal tourism developments and ship groundings. In 1998, a massive climate-related coral bleaching event destroyed or degraded an additional 16% of the coral reefs of the world (Evans, 2002;

Buddemeier, *et al.*, 2004) (see Section 8.10.1, Global Ocean Warming and Coral Bleaching).

Widespread coral bleaching, unknown before the 1980s, has brought recognition that reefs are threatened by global-scale climate factors as well as by more localized threats and that different types of stress may interact in complex ways (Buddemeier, *et al.*, 2004). It is estimated that an additional 32% of the world's coral reefs are now seriously threatened. In 2000, the Global Coral Reef Monitoring Network (GCRMN) estimated that 27% of all coral reefs were effectively lost (Evans, 2002). Wilkinson (2004) estimates that 20% of the world's coral reefs have been effectively destroyed and show no immediate prospects of recovery. CORDIO (1999) states that human activities, particularly land-based pollution and coral mining potentially threaten an estimated 58% of the world's coral reefs. In 2004, the Global Coral Reef Monitoring Network (GCRMN) estimated that (The Washington Post, 2004) (Table 8.3):

- 20% of the world's coral reefs have been destroyed and show no immediate prospect for recovery;
- 24% are under imminent risk of collapse through human pressures; and
- 26% are under a longer term threat of collapse.

"Experts from each region, as well as people with considerable experience provided the assessments. However, these assessments should be regarded as indicative, because there are insufficient coral reef monitoring data for many of these regions to make definitive statements on losses and authoritative predictions on the future" (Wilkinson, 2004).

Table 8.3: Summary of the current status of coral reefs in the 17 regions of the world designated as nodes within the Global Coral Reef Monitoring Network (GCRMN)

Region	Area km ²	Destroyed Reef (%)	Reef Recovered %/Reef Destroyed in 1998	Reefs at Critical Stage (%)	Reefs at Threatened Stage (%)	Reefs at Low or No Threat Level (%)
Red Sea	17,640	4	2/4	2	10	84
The Gulfs	3,800	65	2/15	15	15	5
East Africa	6,800	12	22/31	23	25	40
SW Indian Ocean	5,270	22	20/41	36	31	11
South Asia	19,210	45	13/65	10	25	20
Southeast Asia	91,700	38	8/18	28	29	5
E & N Asia	5,400	14	3/10	23	12	51
Australia, PNG	62,800	2	1/3	3	15	80
SW Pacific Islands	27,060	3	8/10	18	40	40
Polynesian Islands	6,733	2	1/1	2	3	93
Micronesian Islands	12,700	8	1/2	3	5	85
Hawaiian Islands	1,180	1	NA	2	5	93
U.S. Caribbean	3,040	16	NA	56	13	15
North Caribbean	9,800	5	3/4	9	30	56
Central America	4,630	10	NA	24	19	47
East Antilles	1,920	12	NA	67	17	4
South Tropical America	5,129	15	NA	36	13	36
TOTAL	284,803	20	6.4/16	24	26	30

- 1) Destroyed Reefs (%) = 90% of corals lost and unlikely to recover soon
- 2) % Reefs recovered/% reefs destroyed dates from 1998 bleaching event
- 3) Reefs at critical stage (%) = 50-90% coral loss and likely to fall into Destroyed Reef category in 10-20 years
- 4) Reefs at threatened stage (%) = 20-50% of coral loss and likely to reach Destroyed Reef Stage in 20-40 years
- 5) NA: Not applicable, no losses in 1998

Source: Wilkinson (2004) with permission, Australian Institute of Marine Science (AIMS).

In other words, 20% of the world's coral reefs have been destroyed and another 50% are heading in that direction, leaving only 30% of the world's coral reefs in a very healthy state as of 2004. Goreau (2005) believes that many of these

"estimates are too low as they are based largely on measurements started only after much of the coral was gone, and not based on knowledge or photographs of how the reefs used to be".

A total of 40% of the world's coral reefs may be lost by 2010; particularly those near human populations, and if current pressures continue unabated, 58% may be lost by 2030, unless urgent management action is taken to reduce human impacts on reef ecosystems (Evans, 2002). However, in many areas, the trend in coral reef health is downward and these ancient ecosystems are in peril. In other areas, there is no adequate monitoring and information to assess the reef condition or determine the effectiveness of management actions (Evans, 2002).

Wilkinson (2002) estimates that globally the mean hard coral cover is only 32% with the percent hard coral cover being significantly higher on reefs having no anthropogenic impacts. Algal cover was higher on reefs rated as having high sewage inputs. It is estimated that the live coral cover on many reefs in the Caribbean declined from an average of 50% 30 years ago to an average of 10% at present (Gardner, Côté, Gill, Grant & Watkinson, 2003 *In: Buddemeier, et al.* 2004). Wilkinson (2004) estimates that coral cover on many Caribbean reefs has declined by 80%, though there is some sign of recovery.

"The regional pattern of decline is alarming; with coral cover decreasing from more than 50% on average in 1977 to approximately 10% in 2001, i.e. a loss of 80% in 25 years... There are currently 116 million people living within 100 km of a Caribbean coast, which is a 20% increase in the past 10 years. These pressures and the threats of global climate change pose a potential major threat for the future" (Wilkinson, 2004).

Bryant, *et al.* (1998) indicate that just under 60 million people live near the coast in the Caribbean. It is estimated that in the Caribbean (Wilkinson 2004):

- 64% of Caribbean coral reefs are threatened by high levels of human activities, especially the Eastern and Southern Caribbean, Greater Antilles, Florida Keys, Yucatan, and the Mesoamerican Barrier Reef;
- Coastal development threatens 33% of the region's reefs. The threat is greatest in the Lesser and Greater Antilles, Bay Islands of Honduras, Florida Keys, Yucatan, and Southern Caribbean;
- Land-based sources of pollution and sediments threaten 35% of Caribbean coral reefs, most notably Jamaica, Hispaniola, Puerto Rico, the high islands of the Lesser Antilles, Belize, Costa Rica, and Panama;
- Pollution and damage from ships threatens 15% of coral reefs, especially around large ports and cruise tourism centers. Over-fishing threatens more than 60% of Caribbean coral reefs, particularly on narrow coastal shelves near human population centers;
- Diseases and rising sea surface temperatures threaten reefs across the Caribbean.
- Ineffective MPA management threatens Caribbean coral reefs with only 6% of 285 MPAs rated as effectively managed; and
- There will be large economic losses if coral reef degradation continues with a predicted loss of \$350-870 million per year by 2015 of the US\$ 3,100 million to \$4,600 million of current annual benefits from fisheries, dive tourism, and shoreline protection services.

There is concern that coral reefs in the Caribbean recover more slowly from various stresses than Indo-Pacific Reefs (Sammarco, 1985; Kojis & Quinn, 1994; Done, 1999 both *In: Buddemeier, et al., 2004*), possibly due to the small size of

the Caribbean, which is to a large part impacted by land-based pollution that to date is not decreasing. This makes it difficult for replacement larvae from upstream reefs to recolonize since pollution prevents recolonization. In addition, many of the upstream reefs themselves are also degraded since so much of the Caribbean is situated close to heavily populated land masses so that larvae are not readily available for recolonization, prolonging the monopolization of coral reefs by epiphytic (macro) algae (Buddemeier, *et al.* 2004).

Among the high biodiversity Indo-Pacific reefs, those of Southeast Asia (Indonesia, Philippines, and surrounding areas) have been impacted by land-based pollution and destructive fishing practices such as dynamite and cyanide (see Section 8.10.4, Coral and The Aquarium Trade). They have the advantage of a higher biodiversity and a large scale through flow of ocean water and neighboring reef systems that can provide larvae to recolonize (Burke, Selig, & Spalding, 2002 *In: Buddemeier, et al., 2004*). Elsewhere in the Indo-Pacific, coral reefs are not currently subjected to major anthropogenic impacts (land-based pollution and destructive fishing practices) (Buddemeier, *et al.*, 2004), Pacific and Australian reefs remaining healthy (Wilkinson, 2004), and therefore will be more likely impacted by climate change (Buddemeier, *et al.*, 2004).

Human pressures continue to increase the risk of coral reef degradation in the Indian Ocean (Wilkinson, 2004). Off East Africa, it is estimated that 12% of the 6,800 km² of coral reef has been destroyed, while 23% is critical risking to be destroyed in the next 10-20 years, 25% threatened with risk of destruction in the next 20-40 years and 40% under no threat (Table 8.3). This provides the East Coast of Africa, ample opportunity to deal with issues such as land-based pollution and destructive fishing practices (e.g., dynamiting on reefs off Tanzania) at a local level before they become major problems, while globally the world tries to address global warming and the related factors discussed above. More detailed

discussions and personal observations of the principal author concerning the health and condition of East African coral reefs are contained in Section, 8.11 COASTAL DEGRADATION EAST AFRICA AND SOUTHWESTERN INDIAN OCEAN and Section, 8.12 SUMMARY - PERSONAL OBSERVATIONS OF CORAL REEF DEGRADATION IN AFRICA.

8.4.1 Rising Concern Over the Health of Coral Reefs and Related Ecosystems

To combat the serious threats to coral reefs worldwide, the under secretary of state, Timothy E. Wirth, announced the establishment of the International Coral Reef Initiative (ICRI) in 1994. The U.S. State Department hosted the ICRI Secretariat until 1996 and continues to play a central role in the Initiative. ICRI was designed as a partnership of local communities, scientists, conservation groups, resource users, private interests and governments working to protect and manage coral reef resources including associated ecosystems such as seagrass beds and mangroves. Key objectives include:

- Global reef monitoring;
- Reef management;
- Decrease threats to coral reefs; and
- Public education.

Initiative partners are expanding efforts to reduce the physical changes inflicted on fragile reef communities whether they are due to land-based or marine pollution, ship and anchor impact, alien species, temperature and sea level fluctuation or destructive fishing practices. The most significant global-level effort to address land-based sources of marine pollution is the Global Program of Action (GPA). The U.S. State Department hosted negotiations for the Global

Program of Action in 1996. The Global Program of Action is designed to guide states and regions in developing responses to pollution and physical alterations caused by land-based activities (U.S. Dept. of State, 2001).

In 2000, the International Reef Action Network (ICRAN) was formed. ICRAN is a global partnership of reef experts who are working to halt and reverse the decline of the health of the world's coral reefs. ICRAN has three major goals (UN Foundation, 2001):

- Reef Management;
- Global coral monitoring; and
- Communications and knowledge dissemination.

The authors have seen little evidence so far of an awakening to the crisis on the ground by decision-makers and developers with regard to how coasts and their watersheds are developed, where coral reefs are at issue.

8.5 LAND-BASED POLLUTION

As discussed, a major threat to coral reefs globally is land-based pollution, including sewage from coastal development and degraded watersheds from agricultural runoff and over-grazing (DeGeorges, 1990a; Bryant, *et al.* (1998); CARICOM, 1998; GEF, 2002; Coral Reef Alliance, 2002b). All regions of the world report human factors behind much of the reduced coral cover and declining health of coral reefs, especially from sediment, nutrients and toxic compounds, most originating from land-based pollution and over-exploitation of reefs and related resources including fish, invertebrates, coral, algae and sand, with alarming failures in coral recruitment (Wilkinson, 2002), which is to be expected until the source of pollution and/or degradation is removed. "Coral reefs around

the world continue to decline from increasing human pressures; poor land management practices are releasing more sediment, nutrients and other pollutants that stress reefs" (Wilkinson, 2004).

Land-based pollution as described by the principal author (DeGeorges, 1990a) includes both coastal (e.g., sewage, gray water and coastline modifications by coastal strip development primarily for tourism, urbanization and to a lesser degree industry) and land-based pollution (nutrient, sediment, and pesticide non-point source pollution originating from inland deforestation, agriculture and urbanization-related activities) categories. Thus, land-based pollution would account for over 50% of the key causes for coral reef degradation as described in Bryant, *et al.* (1998). Even with global ocean warming becoming more of a factor, it can be argued that the basis of this is land-based and human-induced.

The U.S. State Department estimates that land-based pollution accounts for 80% of all marine pollution. On a worldwide scale, only a fraction of the total domestic waste receives proper treatment and disposal and ultimately is deposited untreated in coastal waters. These activities result in degraded water quality, reduced light levels (affecting growth) and eutrophication of reef communities (e.g., epiphytic algae smothering reef) (U.S. Dept. of State, 1998a; b; U.S. Dept. of State, 2001). The primary means to address this problem is through sound coastal development based on integrated coastal and water resource/watershed management (U.S. Dept. of State, 1998b).

Pollution enters reef ecosystems in many ways, ranging from specific point sources such as sewage pipes and vessel discharges to more diffuse runoff from land-based sources such as agriculture, coastal development, road construction and on-site wastewater management systems, to airborne sources such as emissions from automobiles and power plants. Excess nutrient loading from

inadequate treatment and disposal of human and animal waste and surface runoff from urban and agricultural lands can also lead to significant changes and damage to the reef community. Discharges of oil, garbage and ballast water from vessels can also impact coral reef species. Marine debris from fishing or other sources also has impacts on some reef ecosystems (Evans, 2002).

The World Bank has raised the concern that

“we need effective management systems, like integrated coastal zone management, representative systems of marine protected areas--including no take fishery reserves--, and the control of point and non-point pollution. If such systems are not put in place, and soon, in the more than 90 coral reef countries around the world, we can expect to see even more rapid declines in the health of coral reefs in the next decade than what we witness today. The future would be dim: further losses in live coral cover, reefs overgrown by algae and a few dominant species, and the absence of large fish, including top predators like sharks and grouper” (World Bank, 1997).

8.5.1 Belize and Land-Based Pollution, Lessons for Africa

The principal author first dived and photographed the coral reefs of Belize in 1973 as a Peace Corps volunteer and a member of the El Salvador branch of the British Sub-Aqua Club (BSAC). The reefs were virgin, very few people ever having dived them. He returned to Belize in 1989, as environmental advisor to USAID, to find wide spread degraded reef.

While coral reef degradation on Caye Caulker and Ambergris Cay could be attributed to inappropriate sewage and over-development, many other areas (e.g. in the south from Dangriga/Stan Creek to the border with Guatemala) could not.²⁰² The principal author and the Caribbean forester²⁰³ for the U.S. Forest

²⁰² See (see Table 8.6) below

Service used oral history, based on interviewing local fishermen, to obtain an idea as to potential causes that have brought about this change in coral reef dynamics (DeGeorges, 1989b).

Most fishermen were convinced that illegal fishing was the primary cause for the decline in lobster and conch yields. However, fishermen agreed that where the “rock” (that is coral) died, the lobster left. As one fisherman put it, “when the lobster’s house gets dirty he leaves”. Many fishermen began observing changes in the structure of the coral community, some placing these at seven to eight years earlier (1981/82) while others estimated that changes started taking place four to six years earlier (1983-1985). The change observed by the fishermen was an increase in algal cover locally known as morasse and a gradual dieback of the elkhorn coral (*Acropora palmata*), known locally as pantia or moose coral. They said that when the elkhorn coral dies, the lobster does not come back (DeGeorges, 1989b)! This could have been from a combination of the “white band” disease that is known to have killed *Acropora* spp. and pollution resulting in high algal cover (see Section 8.10.2, Coral Diseases).

8.5.1.1 Red tide

According to the fishermen, about 10-12 years earlier (1977-1979) a red tide that lasted two weeks occurred up and down the coast of Belize and resulted in a massive die-off of finfish. Red tide is caused by a massive bloom of dinoflagellate plankton, which is toxic to finfish. “The key dinoflagellate which causes red tides in the Gulf of Mexico is Gymnodinium breve, reclassified as Karenia brevis” (Mote Marine Laboratory, 2003).

²⁰³ Dr. Loren B. Ford, Strategic Planning and Resource Assessment, USDA Forest Service Stop 1129, 1921 North Kent Street Room 602, Arlington, VA 22209, lbford@fs.fed.us

“At least three harmful effects can result from red tides: oxygen depletion of surface waters leading to mass mortality of larger invertebrates and fish; ingestion of toxic dinoflagellates by shellfish that concentrate the neurotoxins in their tissues, often leading to paralytic poisoning of their predators (including humans); and liberation of neurotoxins into the seawater by the dinoflagellates creating poisoned water, often resulting in skin irritation to swimmers and surfers” (Williams, 2002).

The Texas Department of Parks and Wildlife (2003) also states, “this organism produces a toxin that affects the central nervous system of fish so that they're paralyzed and can't breathe resulting in fish deaths”.

Causes of red tides are complex; some link it to increased freshwater runoff – low salinity, increased surface temperatures and increases in nutrient levels (Massachusetts Dept. of Public Health, 2003; Texas Dept. of Parks; Wildlife, 2003). Williams (2002) states,

“Complex combinations of environmental factors can generate blooms or rapid population growths of certain marine dinoflagellates. These may include: increased levels of nutrients and certain trace metals in the sea water, sewage runoff and other marine pollution, the meeting of two bodies of water with different physical characteristics, ocean salinity and warm sea temperatures, and duration and intensity of sunlight”.

According to the fishermen, the red tide off Belize killed most finfish except shark and barracuda (e.g., snapper, grouper, triggerfish, parrotfish and reef fish in general died). Lobster and conch populations were not noticeably affected. Many of these fish populations never recovered, especially the parrotfish. Parrotfish are important in grazing algae and coral polyps. Could their decline be linked to this problem? The fishermen did not actively fish for parrotfish except for the rainbow parrotfish, *Scarus guacamaia*, which was only fished during the Lenten season for sale in Honduras and Guatemala.

One year after the red tide, there was a tremendous increase in finfish and lobster yields. Then the finfish and lobster catches dropped and as of 1989 have not returned to pre-red tide yields. Interestingly enough, the red tide had not occurred before nor has it since (Bradley *pers. comm.*; Gonzales, *pers. comm. In:* DeGeorges, 1989b). Could the die-off of algal grazers on the reef from the red tide have resulted in an explosion of algal cover, reef die-off and thus habitat loss, resulting in decreased fish and lobster production and catches? The principal author would argue not by itself, but if in combination with nutrient pollution, yes; this is the “bottom-up” hypothesis supported by the principal author and other key researchers (see Section 8.5.2, Land-Based Pollution, Jamaica, Lessons for Africa, Section 8.3.1, Sea Urchin Dieback and Section 8.3.2, Over-Fishing of Algal Grazers).

8.5.1.2 Increase in minute “brown rods” in water during flood season

From the fishermen’s descriptions, this sounded like an annual bloom of phytoplankton associated with flooding and land-based pollution (DeGeorges, 1989b).

8.5.1.3 Increase in land-based pollution from within Belize’s frontier

Commercial fishermen, Villamar Godfrey and Harry Eiley (*pers. comm. In:* DeGeorges, 1989b), could remember that 15-20 years earlier when most of the rivers in the south were covered with natural vegetation, waters ran relatively clear even during the flood season. With the onset of increased conversion of lands to citrus and banana production by American companies, a significant increase in “dirty water” during the rainy season was observed coming from:

- North Stann Creek (Dangriga);

- South Stann Creek;
- Sittee River;
- Mango Creek; and
- Monkey Creek.

Concurrently, large numbers of refugee farmers, primarily from El Salvador, but also Guatemala, Nicaragua and Honduras, were flocking into Belize to escape economic turmoil and strife from these war torn countries. These *campesinos* practiced primitive slash and burn agriculture, especially along Hummingbird Highway that drains into the Belize and Siburn Rivers. U.S. Peace Corps staff felt that the refugee problem and this form of agriculture were the biggest threat to the natural resource base of Belize (Lou Miller & Steve White, *pers. comm. In:* DeGeorges, 1989b). Lou Nicolait (*pers. comm. In:* DeGeorges, 1989b) had observed slash and burn agriculture causing heavy sedimentation in the coastal zones coming out of the Sittee River and the Bladen and Swazee Rivers on the Monkey River.

Sometimes the water was so discolored that it could be observed to reach clear out to the barrier reef, making diving impossible. The fishermen were worried about pesticides, silt and fertilizers in this water that could be killing the reef. Many fish and invertebrates from the coral reef and even some species of grouper and snapper are believed to spend a portion of the life-cycles in the mangrove estuaries off these rivers and backwater patch reefs behind the barrier islands, all of which could be degraded by degraded watersheds and runoff with heavy sediment loads and other pollutants (DeGeorges, 1989b).

In 1999, sugar exports amounted to about 104,000 tons valued at US\$ 41 million. Export earnings from citrus concentrate amounted to \$37 million, representing an increase of \$2.2 million in export earnings over 1998. Banana production also

increased, from 51,824 tons in 1998 to 56,289 tons in 1999 with a value of \$27.3 million (Bailey, Taylor & Fairchild, 2001). It is fine that such agro-industries exist, but assurances must be made that this is not at the cost of the natural environment. Thus, one could argue that Belize, like Africa, is being plundered by Western multi-nationals for short-term gains with little or nor regard for long-term consequences on the overall environment of the region! It would be interesting to know if they adhere to the same environmental standards as in the USA!

8.5.1.4 Possible increase in land-based pollution from outside Belize's frontier

The fishermen observed that each September currents carrying “dirty water” coming from the Gulf of Honduras clouded over the barrier reef. Deforestation and watershed degradation in the Gulf of Honduras (Guatemala and Honduras) was and probably still is a major problem (DeGeorges, 1989b). Andrefouet, Mumby, McField, Hu and Karger (2002 *In:* Lapointe 2004) using satellite imagery observed the same phenomenon of sediment and nutrients flowing over Belize’s reefs from Honduran rivers after Hurricane Mitch in late October 1998. Lapointe (2004c) believes that the recurrent sedimentation and nutrient enrichment from these events helps explain the recent phase shift from hermatypic corals to macro-algae in the Glover Reef’s Lagoon, Belize.

8.5.1.5 Sea urchin die-off, Belize

The fishermen observed that five to six years earlier (1984-1985) there had been a massive die-off of the long-spined black sea urchin, *Diadema antillarum*, as occurred over the entire Caribbean. Some fishermen said the die-off was three years earlier (1982-1981), but everyone agreed that there had been a die-off. The

Diadema is a grazer and its disappearance can result in increased algal growth on corals (DeGeorges, 1989b). Some researchers believe that the sea urchin succumbed to a viral disease after being weakened by pollution (Ward, 1990; Shinn, 1989 all *In:* DeGeorges, 1990a; Maragos, 1992 *In:* Thayer, 1992). See Section 8.3.1, Sea Urchin Dieback for further discussion on this topic.

8.5.2 Land-Based Pollution, Jamaica, Lessons for Africa

The following case study is extracted from Goreau (2003a), whose father was one of the pioneering coral reef ecologists, extensively studying Jamaica.

“The historical process of coral reef eutrophication is best known from Jamaica, where it has been followed around the island for over 50 years (Goreau, 1992a *In:* Goreau, 2003a). Reefs inside Kingston Harbor, next to the island's greatest concentration of people, were eutrophic in the 1950s and died soon afterwards. Reefs outside the harbor went eutrophic by the 1960s, followed by those of the rapidly expanding tourist towns, Montego Bay in the 1960s, and Ocho Rios in the 1970s. In the 1980s the smaller north coast tourist towns went eutrophic, including the reefs near the Discovery Bay Marine Laboratory. The Negril area and the more remote parts of the island went eutrophic in the 1990s, by which time the only non-eutrophic areas left were along the extremely rugged east coast, with few people because of the high wave exposure, lack of flat land, and extremely rainy climate. At all of these sites the same pattern was seen. Algae species were zoned by nutrient preferences around the point sources of pollution like sewage outfalls, river mouths, and springs, and these zones spread outward from them. With time until they merged and the sources could no longer be clearly seen from the algae distributions (Goreau, 1992b *In:* Goreau, 2003a). Coincident with this process of benthic algae blooms smothering reefs, the water turned from clear blue to dark and green as visibility declined due to phytoplankton blooms.

Ironically, despite the long observations of these trends in Jamaica, the island has also been the key study site for many papers claiming that the cause of algae is low herbivory even though the

fish are now almost entirely herbivorous and the sea urchins have recovered in many places. These studies, almost all based on one time or short-term observation of fish and sea urchins, at one or a few sites without nutrient data, by short-term foreign visitors, have all ignored the long term Jamaican literature on the subject”.

8.5.3 Land-Based Pollution, Kaneohe Bay, Hawaii, Lessons for Africa.

The reefs of Kaneohe Bay Hawaii, where sewage flowed directly into the sea, went eutrophic in the 1970s. The pattern of spread of epiphytic algae from the outfalls indicated that sewage nutrients were the cause (Banner, 1974 *In:* Goreau, 2003a). A very long, deep and expensive sewage outfall pipe dumped the sewage far away at sea, where prevailing current kept it from coming back or from affecting other areas. The algae died back quickly and over the next decade the corals gradually recovered, though not to the previous level of diversity or density (Smith, Kimmerer, Laws, Brock & Walsh, 1981 *In:* Goreau, 2003a). By the 1990s, the human population increase in the watershed resulted in a buildup of nutrients and the system again went eutrophic (Laws & Allen, 1996; Larned & Stimson, 1996 both *In:* Goreau, 2003a). Though the point source of nutrients was eliminated, non-point nutrient source runoff from road runoff, lawn fertilizers and golf courses built up to the point that epiphytic algae again overwhelmed the coral reef. This shows that while algae can be starved, the nutrients must be kept permanently low for long-term success (Goreau, 2003a).

8.6 DOMESTIC SEWAGE AS A KEY COMPONENT OF LAND-BASED POLLUTION

Reefs exist in nutrient-poor environments and for that reason small changes in the nutrient content of the water can adversely affect their survival (Ecological Society of America, 2000). Domestic wastewater discharges are one of the most significant threats to sustainable coastal developments worldwide (Spalding, *et*

al., 2001). The effects of individual domestic wastewater discharges are usually localized, but they are a major source of coastal and marine contamination in all regions and therefore a global issue. Pathogenic organisms in domestic wastewater-contaminated marine and estuarine waters cause massive transmissions of infectious diseases to bathers and consumers of raw and undercooked shellfish with a global economic impact recently estimated at US\$ 10 billion/year (GESAMP & ACOPS, 2001).

Environmental effects associated with domestic wastewater discharges are generally local with transboundary implications in certain geographic areas. The commonality of sewage-related problems throughout coastal areas of the world is significant. Consequently, domestic wastewater discharges are considered one of the most significant threats to coastal environments worldwide. The priority for action on “sewage” was identified by (GPA, 2002):

- The Global Program of Action for the Protection of the Marine Environment from Land-Based Activities (Washington, 1995) (see, 8.3.1, Rising Concern Over the Health of Coral Reefs and Related Ecosystems.);
- Seven regional workshops of government-designated experts held in the period 1996 - 1998 in the framework of UNEP’s Regional Seas Program and involving more than 60, mostly developing, countries; and
- UNEP Governing Council (decision 20/19B.1.d) which requested the executive director, in cooperation with other relevant organizations, to explore the possibility of convening a global conference to address sewage as a major land-based source of pollution affecting human and ecosystem health.

As a response to these identified priorities, the GPA Coordination Office, in close collaboration with the World Health Organization (WHO), Habitat (UNCHS -

United Nations Centre for Human Settlements - Habitat) and the Water Supply and Sanitation Collaborative Council (WSSCC), developed a Strategic Action Plan on Municipal Wastewater and supporting documentation (GPA, 2002).

8.6.1 Inappropriateness of Septic Tanks, Secondary and Tertiary Treatment of Human Wastes in Tropical Waters, Lessons for Africa

Where they exist in the Caribbean, sewage treatment plants have been designed by North American and European engineers who are unaware of the extreme nutrient sensitivity of coral reef ecosystems. Their design (e.g. trickling filter and activated sludge) has typically been undertaken to meet secondary treatment levels. Money is usually put into construction of an expensive plant and sewerage. What little money remains is put into a short outfall under the assumption that public health risks have been minimized (Archer, 1988; UNECLAC, 1985 *In: DeGeorges, 1990a*).

In the case of tourist resorts, most developers use prefabricated sewage treatment “package” plants, also designed to attain secondary levels of treatment or they use septic tank systems. In both instances, effluent is discharged close to shore and/or enters into the nearshore waters indirectly through drainage ditches or through groundwater percolation (Ward, 1990; Archer, 1988 both *In: DeGeorges, 1990a*).

Septic tanks in coastal areas with high groundwater tables often malfunction during heavy rain events, flushing huge quantities of untreated effluent into coastal waters. There are even reported instances of “honey dippers” (trucks that haul septic tank sludge) dumping septic tank sludge, a major solid waste disposal problem, into coastal waters as a disposal method. The sewage pumping trucks often release the load directly into rivers or into sinkholes that recharge groundwater resources, rather than directly into the sea, as this is less visible and

often means a shorter trip. Likewise, many private homes in the Caribbean dispose of domestic sewage through “sumpholes”. In both instances, basically raw sewage is discharged directly into the karst or igneous geology without any regard for the potential to contaminate ground water and potentially coastal marine waters (DeGeorges, 1990a).

In the Caribbean, it has been clearly demonstrated that even secondary sewage treatment plants do not achieve designed treatment levels due to the difficulty in attracting skilled technicians to operate these plants, operational expenses and spare part supplies (Archer, 1988, UNECLAC, 1986 all *In:* DeGeorges, 1988a). Even if they functioned properly, secondary treatment plants do not adequately remove viruses (Table 8.4). While it takes ingestion of many bacteria to make a person ill, it takes the ingestion of only one viral unit to cause illness. In the U.S., where tourism is important, regardless of treatment, outfalls are generally designed to assure a minimum of about two to three days before any of the discharge returns to coastal waters in order to maximize the likelihood of viral die-off from the sun's ultraviolet rays.

Likewise, secondary treatment does not adequately remove the nutrients (nitrogen and phosphorus) that are ecologically damaging to coral reefs and grass beds (Table 8.4) (DeGeorges, 1990a) and (Table 8.5) (Bellairs Research Institute, 1989 *In:* DeGeorges, 1990a).

Table 8.4: Comparison of pollution removal by wastewater treatment and disposal options

Treatment Level -Effluent Concentrations				
Parameter	Raw Sewage (a)	Primary (b)	Secondary (a)	Tertiary (a)
Total Suspended Solids (TSS)	100-350 mg/l	35-123 mg/l	25-40 mg/l	5-16 mg/l
Biological Oxygen Demand (BOD)	100-300 mg/l	65-195 mg/l	25-35 mg/l	5-15 mg/l
Total Phosphorus as P	6-20 mg/l	10% Reduction(c) or less	8 mg/l (10% Reduction (b) to 30% Reduction(c))	0.5-8 mg/l 99% (b) Reduction
Total Nitrogen as N	20-85 mg/l	20% Reduction(c) or less	30 mg/l (d) (10% Reduction (b) to 50% Reduction(c))	3-30 mg/l (e) 90% (b) Reduction
Viral Reduction	10,000 units/l Max. Conc., 1,000 units/l typical (f)	0-3% (f)	90% prior to Disinfection (g)	90-99.99% (h) Metallic or Polyelectrolyte Coagulation + PH Adjustment
Total Coliforms million organisms per 100 ml	Average 30 (i)	Average 2 (i)	Average 0.001(i)	-----
Fecal Coliforms million organisms per 100 ml	Average 4 (i)	-----	-----	-----
(a) Source: USEPA (1977) Note: Low value weak sewage, high value strong sewage				
(b) Source: USEPA (1976) Note: Indicates that for primary treatment there is a 65% reduction in TSS and 35% reduction in BOD. Values shown computed from raw sewage data shown in above table.				
(c) Source: Clark (1977)				
(d) Low value based on Two-stage lime coagulation and filtration				
(e) Low value based on Two-stage lime coagulation, filtration and selective ion exchange or biological nitrification-denitrification.				
(f) Source: USEPA (1972) (g) Source: USEPA (1978)				
(h) Source: USEPA (1980) (i) Source: Zison, Haven & Mills (1977)				
All in Source: DeGeorges (1990a)				

Table 8.5: Comparison of sewage treatment levels proposed for Grand Anse Beach, Grenada

Parameter	Typical Secondary Treatment Effluent Characteristics			Preliminary Treatment
	Facultative	Aerated	Extended	
TSS mg/l	40	40-60	20-30	200
BOD mg/l	30	30-45	15-20	190
Total Coliform (#/100 ml)	5,000-10,000	100,000	10,000	40,000,000
Nutrient Removal	Negligible	Negligible	Increase in Nitrates	None
Detention Time (Days)	?	6-8	18-24	None
Construction Cost (US\$)	1.5 million (Note: Does not include cost of outfall)	1.5 million	1 million	300,000
Annual Operation and Maintenance Cost (US\$)	35,000	150,000	150,000	35,000
Sludge	Medium	Low	High	Minimal: still generates 100 kg dry weight of solid waste/day
Skill Required to Operate	Low	Medium	High	Low
Land Area Required (Acres)	8-10	5	1	0.5
Hurricane Vulnerability	Low	High	High	Low
Seismic Vulnerability	High	High	High	Low
Source: Bellairs Research Institute (1989) with permission, Bellairs Research Institute.				

NASA and other groups have experimented with artificial wetlands to achieve secondary treatment but this also requires sizeable land and a skilled technician to run the system and retain all of the above limitations with regard to effluent limitations. Nitrogen removal, primarily due to nitrification/denitrification, is 26-96% in aquatic plant treatment systems (natural wetlands), and 25-85% in

constructed (artificial) wetlands. Phosphorus removal in wetlands and aquatic plant treatment systems is not very effective because of limited contact between wastewater and the soil. National Space Technology Lab studies with water hyacinths achieved a 28-57% phosphorus removal. The principal mechanisms for phosphorus removal are plant uptake or retention in the soil (USEPA, 1988).

Tertiary treatment would be the solution if high tech were to be used in order to solve both ecological and public health problems in the tropical waters of the Caribbean. Even then, a long outfall would be desirable in order to maximize protection of the reefs and to minimize public health risks to bathers where tourism is an important sector of the economy. Unfortunately, this is very expensive, highly sophisticated and inappropriate technology for most of the developing world. If secondary treatment systems cannot be maintained then tertiary systems would pose that much more of a problem and expense. Sealy (2002) explains that even with tertiary treatment a long outfall may be necessary to achieve appropriate nutrient dilution necessary to protect coral reefs.

As a result, the nearshore discharge of effluent from sewage treatment plants throughout the Caribbean continues to pose both public health and ecological risks, both of these factors being vital to the sustainability of tourism.

It should be noted that the ecological risks are not only due to nutrient enrichment. If chlorination to kill bacteria/viruses is undertaken improperly, high residual chlorine levels in the effluent can be extremely toxic to aquatic life.

8.6.2 Montego Bay, Marine Park or Marine Cemetery? A Lesson for Africa

In the case of Montego Bay, there was a trickling filter plant built in 1966 to handle 0.75 million gallons of sewage per day (MGD). By 1988, four times this

amount of sewage was being sent to the plant, most of which was bypassing the latter, raw sewage being dumped into the mouth of the Montego River 200 m from the sea (DeGeorges, 1988a). Many hotels in Montego Bay were on package plants or septic systems. Since local drainage waters are naturally high in nitrogen (Woodley, *pers. comm.* In: DeGeorges, 1988a; Goreau & Thacker, 1994; Lapointe, 1997; Goreau, 2003a), the additional loading of phosphorus, often considered the limiting factor in algal production from improperly or untreated human sewage and wash (gray) water, can heavily eutrophy a system, resulting in heavy algal overgrowth on coral. In Montego Bay, most of the coral reef was dead. Goreau (1994) notes,

“coral reefs near Kingston were affected in the 1950s and 1960s, reefs near Montego Bay²⁰⁴ and Ocho Rios are thought to have been impacted in the 1970s, the area from Rio Bueno to Runaway Bay was affected in the 1980s, and Negril and parts of Western Jamaica were affected in the early 1990s (Goreau, 1992b In: Goreau, 1994). Algae overgrowth spread outward from source areas in expanding rings which were initially focused around local sources, but which have since begun to merge along much of the coastline. Along most of the south and north coasts eutrophication has become a persistent regional phenomenon. In addition nutrient inputs are causing permanent planktonic algae blooms, turning formerly clear blue waters dark, turbid, and green. At present only the least developed and populated areas have coral reef in good condition, with algae cover around 20% or less”.

The principal author made a series of recommendations to USAID, including the need for a long outfall as opposed to upgrading and/or renovating the existing sewage treatment plant and hooking in any hotels and restaurants on the bay into this system, as well as the need for working in soil conservation with the small-scale farmers degrading the watersheds of the two rivers entering the bay, the

²⁰⁴ Andrew Baynes (*pers. comm.*), First Class Diver, British Sub-Aqua Club and Head of El Salvador Branch in the 1970s would often recount his experience of diving Montego Bay to the principal author in the 1960's/early 1970s explaining that it was one of the best coral reefs/dive sites in the world.

Montego and Great Rivers, and the importance of establishing a water quality monitoring program.

These recommendations were made to USAID and The Nature Conservancy (TNC). A Nature Conservancy staff member²⁰⁵ was more than open to these ideas, but The Nature Conservancy management²⁰⁶ wanted to blame everything on the fishermen (“top-down” hypothesis – see Sections 8.3.1, Sea Urchin Dieback and 8.3.2, Over-Fishing of Algal Grazers), taking a typical preservationist approach to the idea of the marine park, which involves placing buoys around the reef defining the park and removing the fishermen. The management was oblivious to the real issues and/or had no interest in addressing them. With no biological data, the management claimed that the fishermen were over-fishing and over-harvesting algal grazing fish, resulting in the dead and dying reef, which The Nature Conservancy (TNC) staff had no idea existed until the principal author showed them his underwater slides. The principal author had the impression that management’s main goal was to finalize a grant with USAID and that what has been discussed above complicated the matter and possibly risked a simple straightforward contract having to be rewritten in order to address the real issues, and/or having to be dropped since possibly the costs of addressing the issues were beyond the budgetary limits of USAID.

As Goreau and Thacker (1994) explain with regards to degradation of Jamaican coral reefs,

“the fact that eutrophication has followed the course of coastal development and increasing resident and visitor populations, along with their releases of inadequately-treated sewage, suggests that excessive algae growth has been fertilized by increasing nutrient inputs rather than being due to destruction of corals by hurricanes,

²⁰⁵ Brian Houseal of The Nature Conservancy based out of the Washington, D.C. Headquarters

²⁰⁶ Dr. Gina Green based out of The Nature Conservancy Washington, D.C. Headquarters

which took place at the same time at all sites, or due to over-fishing, which had removed most of the top predatory fish and reached unsustainable catch/effort ratios more than 20 years ago (Aiken, 1991 *In: Goreau & Thacker, 1994*). It has been proposed that over-harvesting of algae-eating fish and epidemic die-off of algae-eating sea urchins has caused overgrowth of algae, and that only severe reductions in fishing can allow reef recovery. However, in recent years sea urchin populations have recovered towards pre-mortality levels in certain areas, but the algae have not vanished or the reefs recovered. Algae are also overgrowing deep fore reef sites where sea urchins were always rare compared to shallow back reef areas. In many parts of the island over-fishing of predatory fish has resulted in much more extensive domination of fish populations by algae-eating surgeonfish and damselfish, without evidence of algae reduction. Recovery of sea urchin eating triggerfish populations would be predicted to reduce sea urchins and increase algae if the over-fishing hypothesis was correct, but reef eutrophication was absent when triggerfish were still common. Algae abundance appears to be primarily controlled by available nutrients rather than by herbivory. While there is no doubt that over-fishing has dramatically reduced fish sizes and species diversity, there is little reason to believe that reductions in fishing alone would have any significant impact on algae overgrowth unless nutrient sources are reduced”.

Goreau goes on to say,

“In the last few years there has been a flood of papers blaming algae on lack of herbivores due to over-fishing, done by people who know how to count fish and sea urchins but not how to measure nutrients. Brian Lapointe and I measured nutrients and the physiological response to them, and in fact Jamaican reefs, far from lacking herbivores, now have nothing but herbivores, as algae is the only food left, due to the excessive nutrients. In 1996 we found it impossible to find sites in Jamaica below the critical limits (of nutrients) except in the rough and windward east. The result of all this bad science is worse policy: the herbivore people blame the fishermen, who are in fact the victim of everybody else's pollution (see Section 8.3.3, Caribbean Fishermen Victims or Culprits – Lessons for Africa). Barbados is very high in nutrients too, but oddly enough there are few macroalgae, only a dense, low, rapidly

growing algal turf, that is heavily chomped on by the huge parrotfish, which Bajans don't eat" (Goreau, 2004c).

The USAID personal services contractor²⁰⁷ managing The Nature Conservancy (TNC) project as well as nearby small-scale farmer watershed/soil conservation management projects told the principal author that it was too complicated, bureaucratically, to include the Montego and Great Rivers that discharge into Montego Bay in the existing USAID soil conservation/watershed programs. After the principal author had showed the USAID personal services contractor and The Nature Conservancy (TNC) underwater slides, the personal services contractor asked if he could borrow them to make copies, but conveniently lost the slides that showed what a disaster area the reef was in this marine park. Often bureaucrats and NGOs/contractors conspire, no different than dam builders and governments, since at the end of the day for most it is about money, power security and last but least - addressing real issues or empowering local people to sustainably manage their resources, much so-called development and conservation in the tropics being unsustainable. It was evident to the principal author that when he left Jamaica, 99% of his recommendations would be ignored, as was the case in most of the advisory roles he had with the U.S. government in both the Caribbean and Sub-Saharan Africa.

8.6.3 Sewage Treatment throughout the Caribbean

The principal author has assessed the inadequacy of treatment throughout much of the Caribbean (Table 8.6) (DeGeorges, 1990a). The degraded coral reef noted in this table is very likely due to a number of causes, not just from inappropriate sewage technology, but definitely related to land-based pollution (e.g. sedimentation, pesticide and fertilizer runoff from agriculture).

²⁰⁷ Mark Nolan

Table 8.6: Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)

LOCATION	SEWAGE TREATMENT LEVEL	OBSERVED ECOLOGICAL IMPACTS
BARBADOS		
-Bridgetown	-Activated sludge	-Major odor problems, short outfall degrading surrounding environment.
-West and South Coast (major tourism areas)	-Hotels on septic systems or package plants with short outfalls -Note: Deepwater outfall planned for Bridgetown and West Coast	-Fringing reefs 99% dead, outer bank reefs beginning to show signs of algal overgrowth, nearshore fishing on a decline, beach erosion accelerating. -Reef mostly dead from inappropriate sewage and apparently high sedimentation associated with steep-sloped agriculture.
		-“Barbados reefs are eutrophic, but because there is high parrotfish grazing the algae are made of short turfs rather than fleshy macrophytes, but the dead coral is still algae covered” (Goreau, 2005).
GRENADA		
-St. Georges	-Raw sewage outfall.	-Did not dive area, but outfall appeared too short in relation to currents, risking to contaminate nearshore waters (see Table 8.7) – 400 meters outfall – real question is degree of offshore currents in region of outfall to dilute and carry pollution out to sea
-Grand Anse Bay	-Three tourist hotels on septic systems, Medical school on septic system. Private homes?	-High incidence of eye, ear and skin infections & High percentage of the <i>Porites sp.</i> coral dead and overgrown with <i>Dictyota sp.</i> algae

Table 8.6 (Cont.): Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)

LOCATION	SEWAGE TREATMENT LEVEL	OBSERVED ECOLOGICAL IMPACTS
<u>TOBAGO KEYS, THE GRENADINES:</u>	-Up to 140 boats a day anchor in the vicinity of these reefs during the winter months, none of which have holding tanks.	-Approximately 99% of the elkhorn coral (<i>Acropora palmata</i>) dead but still standing
<u>Horseshoe and World's End Reefs</u>	-Additional pollution is believed to come from inappropriate sewage disposal on the islands of Petite St. Vincent, Petite Martinique, Union, Mayreau, Canouan and Palm.	-Approximately 30-40% of <i>Porites</i> sp. Dead -Overall state of reef degraded, much of dead coral covered in light purple coralline algae
<u>ST VINCENT</u>		
<u>Young Island and the Bay lying between Young Island and Dike Island</u>	-Hotels on septic systems -Large number of sail boats with no holding tanks	-Coral reef around Young Island and mainland hotels mostly dead -Large areas of dead elkhorn and <i>Porites</i> sp. Elkhorn alive in the early 1980s
<u>Kingstown</u>	Central collection system pumping raw sewage into Kingstown Harbor	----- Between Harbor and Camden Industrial Park: -Old Woman Point. Shallow star coral shows signs of bleaching. Deeper portions of reef - star and other coral in reasonable condition -Turtle Bay most of reef algal covered -Coral Garden near industrial park, mostly dead algal-covered <i>Porites</i> sp. -Questelles Point just north of industrial park, most of coral appears healthy, lots of deep water star coral, <i>Montastre annularis</i>

Table 8.6 (Cont.): Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)

LOCATION	SEWAGE TREATMENT LEVEL	OBSERVED ECOLOGICAL IMPACTS
ST. LUCIA Castries	-Sewage collection, preliminary treatment dumped into harbor	-Water quality and marine benthos study by Caribbean Health Institute showed area to be very eutrophic.
Anse Chastinet, Pitons Area	-Hotel on septic system -Town? Septic systems	-Some of best reef in the Windward Islands. -Watershed a protected rainforest – low human population
DOMINICA		
Roseau	-Up to ten raw sewage outfalls	-Dangleben's Reef. Shallower than 30 feet coral smothered in <i>Dictyota sp.</i> algae. Below 40 feet depth, algae cover falls off and living coral becomes more dominant.
Small Coastal Villages	-Community pit latrines right on the edge of the sea	
Other	-Many people dump chamber pots into streams.	-La Bim wall covered in silt -Hot Springs area covered in <i>Dictyota sp.</i> Algae -Scottshead area some good reef, but heavily algal covered -Point Des Fou reef walls nice but coral heavily covered in algae

Table 8.6 (Cont.): Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)

LOCATION	SEWAGE TREATMENT LEVEL	OBSERVED ECOLOGICAL IMPACTS
<u>ANTIGUA</u>	Becoming heavily built out for tourism, hotels on septic systems or package plants.	<ul style="list-style-type: none"> -British Armed Forces divers as part of Reef Watch warn Antigua government that its reefs are rapidly degrading from sewage and sedimentation. -Shallow offshore reefs on high-energy zone at Ariadne Shoals and Soft Willie appear degraded.
<hr/>		
<u>ST. KITTS</u>		
Basseterre	-No sewage or collection system, sewage flushed into Basseterre Harbor during rain events	-USAID sponsored Southeast Peninsula environmental study found that most of the reefs south of Basseterre were degraded and algal covered.
Sugar Cane Refinery	-Dumps untreated waste into Basseterre Harbor	
Frigate Bay Hotels	-Package treatment plants into lagoons, one discharging into Atlantic and the other to the Caribbean side, newer hotels treatment discharge unknown	
<u>U.S. VIRGIN ISLANDS</u>	Secondary treatment and septic systems?	Personal communication between the author and natural resources planner from islands associated with Ed Towle of Island Resources Foundation, leads the author to believe that there is heavy coral reef degradation.

Table 8.6 (Cont.): Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)

LOCATION	SEWAGE TREATMENT LEVEL	OBSERVED ECOLOGICAL IMPACTS
<u>HAITI</u>		
Port Au Prince	No known treatment systems! Raw sewage direct or through groundwater seepage	Les Arcadins Marine Park contains severely degraded coral smothered by <i>Dictyota</i> sp. algae.
<u>DOMINICAN REPUBLIC</u>	Unknown	Coral reef appears healthy.
<u>HAITI</u>		
Port Au Prince	No known treatment systems! Raw sewage direct or through groundwater seepage	Les Arcadins Marine Park contains severely degraded coral smothered by <i>Dictyota</i> sp. algae.
<u>JAMAICA</u>		
<u>Montego Bay</u>	-Trickling filter plant is being bypassed dumping 3.0 million gallons/day of raw sewage into Montego River 200 meters upstream from where it enters Montego Bay	Coral reef over the entire bay is mostly dead and algal/silt covered.
<u>Note: Deepwater outfall planned?</u>	-Some hotels on septic systems and package plants -Two major rivers with small-scale farmers using inappropriate soil conservation resulting in heavy siltation	

Table 8.6 (Cont.): Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)

LOCATION	SEWAGE TREATMENT LEVEL	OBSERVED ECOLOGICAL IMPACTS
BELIZE		
<u>Belize City</u>	-Oxidation ponds with nearshore outfall	-Coral reefs dived by author along Belize's 240-250 km barrier reef appear to be highly degraded and have high algal cover.
<u>Ambergris Cay, Holchan Marine Park</u>	-Septic tanks at most hotels	
<u>Caye Caulker</u>	Four inch raw sewage outfalls	-This includes the outer atolls such as Lighthouse and Blue Hole, though they are less degraded than the barrier reef along two Cayes.
<u>Placencia</u>	-Fishing village, maybe one resort ?	
<u>Lighthouse Reef and Blue Hole</u>	-No sewage, Virtually undeveloped	-Obvious other factors coming into play, but sewage believed to be major cause of degradation.
Observed Ecological Impacts (cont.):	Observed Ecological Impacts (cont.)	
-Other possible causes linked to land-based pollution, noted by local fishermen are rivers & streams that now run dirty from watershed degradation linked to U.S. citrus companies, and refugees practicing slash and burn agriculture in Belize. Fishermen also claim that "dirty" water from the deforested Gulf of Honduras flows over the reef during the rainy season.	-Cay Caulker (cont.): In the shallow backwater areas, boulder coral (mountainous star coral) alive along the edges but smothered with algae on the top similar to Mexican Rock at Ambergris Cay. -Fishermen claim that in the late 1970s a hurricane hit and a fertilizer ship ran aground on Lighthouse Reef. Fertilizer never removed, and a freak red tide killed off many of the fish that are algal grazers, especially parrotfish whose populations have never recovered. These events could be linked and need further investigation.	-In vicinity of Ambergris Cay and Cay Caulker, annual production of sewage equivalent of dumping 6,500 fifty pound sacks of 20/10/10 (N/P/K) fertilizer onto barrier reef. -Cay Caulker: structurally intact dead elkhorn corals, <i>Acropora palmata</i> , at the very top of the barrier reef. In the cut, large areas of massive leaf coral, <i>Agaricia agaricites var. danai</i> , smothered in algae. Dead elkhorn coral covered in coralline algae also seen intact at depths of 15 feet.

Source: DeGeorges (1990a)

However, where quantitative data exists, coral reef degradation has been closely linked to inappropriate sewage disposal (Tomascik & Sander, 1985; Hunte, 1987; Bellairs Research Institute, 1989; Tomascik & Sander, 1987a; 1987b all *In:* DeGeorges, 1990a; Goreau, 2003a; Lapointe, 2004b; Lapointe, *et al.*, 2004).

Goreau (2005) notes that “death of the elkhorn (coral) in the Eastern Caribbean was due to ‘White Band’ disease around 1979” (see Section 8.10.2, Coral Diseases). If there are high nutrient discharges in the area, this dead coral will tend to have high algal cover.

Sealy (2002) presents additional information on current sewage treatment, which reflects steps being taken by the governments of Barbados and Grenada to protect coral reefs while the principal author was in the Caribbean (Table 8.7).

“The majority of the countries have achieved less than 20% sewerage coverage of their populations. Most of the population on these islands resides on the coast resulting in significant loading of nearshore waters with nutrient and bacteria rich wastewater” (Sealy, 2002).

Table 8.7: Overview of domestic wastewater systems in selected Caribbean countries, 2002

Country	Size of Population	% Sewered	Level of Treatment		Method of Disposal		Length of Outfall (m)	Depth of Discharge (m)	
Bahamas	300,000	< 15	Secondary		Deep well injection		0	130	
Barbados	268,000	a) 3	a) Secondary (Bridgetown)		a) Marine outfall	300	a) 13		
		b) 12							
		b)	Advanced Preliminary (South Coast)		b) Marine outfall	1100	b) 38		
Grenada	91,000	< 5	a) Preliminary (St. Georges)		a) Marine outfall	400	15		
			b) Preliminary (Point Salines)		b) Marine outfall				
Jamaica	2,600,000	15	Primary		Marine outfall	Ocho Rios outfall - 500	27		
		10	Secondary		Marine outfall				
St. Lucia	170,000	< 6 < 3	None (Castries)		Marine outfall	< 10	< 10		
			Secondary (Rodney Bay)		Water course				
Trinidad and Tobago	1,300,000	20	a)	Secondary - stabilization ponds (Beetham)	River	NA	NA		
			b)	Secondary - trickling filters (San Fernando)	River				
			c)	Secondary trickling filters (Arima)	River	Sea	NA		
			d)	Tertiary - extended aeration (Scarborough)	Sea				

8.6.4 The Solution to Pollution is Dilution for Human Waste Disposal in the Caribbean and Most Tropical Waters, Lessons for Africa

USAID spent 1988-1990 working with the Bellairs Research Institute, which is associated with the University of the West Indies and McGill University, Canada. Using local Caribbean ecologists, sanitary engineers and oceanographers, it was determined that in most cases, the old adage “**the solution to pollution is dilution**” holds true for the tropical areas of the world. The pollution problem, both in terms of public health and ecology, is a nearshore coastal phenomenon. Modern-day technology solves neither of these issues without resorting to extreme expense and sophistication, neither of which is appropriate to the developing world.

It has been determined that in most cases in the Caribbean, the solution to wastewater treatment and disposal is preliminary treatment with a long outfall which will go beyond the coral reefs into the open ocean and be quickly diluted out by offshore currents. This is the solution being chosen by both Barbados and Grand Anse in Grenada. The first reaction of many ecologists from the northern hemisphere will be that this is unsound.

First of all, this is a nearshore problem. Secondly, if one takes all of the Windward and Leeward Islands, there are only about 700,000 residents (in 1990) plus temporary tourists, not even the size of a large metropolitan area in the United States or Europe which may contain 10 million or more residents plus significant quantities of industrial wastes. In the Caribbean, with few exceptions (e.g. rum distilleries and sugar cane refineries), most sewage is human and contains only conventional pollutants (organic matter, suspended solids, nutrients and bacteria/viruses). Furthermore, the Caribbean Sea is vast relative to the amount of human pollution. It is not a closed system with a long detention time

(e.g. Chesapeake Bay, Great Lakes and Mediterranean Sea) or of limited carrying capacity to absorb such pollutants, as with many rivers.

The solution for Grand Anse, Grenada consists of a collection system for both domestic sewage and gray water (wash water), preliminary treatment to remove grease, grit and large particulate matter (25-75 mm screens producing 100 kg dry weight of solids per day under maximum operation), followed by a 350-meter (1,148 foot) outfall with a 100/1 diffuser off Point Salines (Table 8.7). The length of the outfall was determined by conducting long-term oceanographic current studies to locate the best site in the area that has the strongest offshore currents on a year-round basis. This was combined with water quality modeling to determine at what point beyond discharge that nutrient and other water quality concentrations would be returned to background levels, which was about 200 m from the discharge point.

Finally, it comes down to economics, that is land costs (a premium on islands), construction costs, operation and maintenance costs including collection and disposal of sludge, which can become a solid waste problem and finally the cost of a highly skilled technician to run the facility. A comparison of these factors for the 600,000 gpd (gallon per day) (0.6 MGD) facility being planned for Grand Anse Beach, Grenada is contained in Table 8.5. Using design criteria of 170-227 liters/day/person (45-60 gpd/person) of sewage, this system in theory could serve between 10,000-13,300 people. In this case, construction costs of secondary treatment alone are from three to five times the cost of preliminary treatment and do not solve the ecological or public health problems without an extended outfall (Tables 8.4 and 8.5).

Off Barbados, there were

“exhaustive studies (which showed) that an outfall positioned outside of the bank reefs (for South Coast sewage) would take advantage of strong offshore currents and would have minimal impact on marine ecosystems. The project was designed and constructed to take advantage of the assimilative capacity of the ocean. The LBSMP (Land-Based Sources of Marine Pollution Protocol) does not appear to take into account the natural carrying capacity of the Caribbean Sea” (Sealy, 2002) although it should.

Such decisions must be made on a case by case basis taking into account the amount of sewage produced, background water quality, degree and drop off of littoral zone, oceanographic conditions and distance between impact areas (e.g., islands and coral reefs) versus dilution to background levels.

8.6.5 Other Sewage Treatment Options

Although land disposal (e.g., spray irrigation and deep well injection – 100s of feet into the ground below impervious layers or a high density aquifer which will trap wastewater) should be considered as an option, this normally requires at least secondary treatment, and sophisticated technology and timing (e.g., effluent from spray irrigation usually sprayed at night in order to minimize the risk of viral aerosols contaminating humans). Operation and maintenance thus return as a problem, although this could be resolved if the hotelier or ideally a group of hoteliers and/or a city were willing to pay the cost of a highly skilled technician to maintain the system. However, in general this has not proven successful in the tropics. It appears that often more effluent is produced than needed for irrigation (DeGeorges, 1990a).

A long outfall with minimal treatment may not be the best solution off of Belize, with its shallow continental shelf and extensive reef network, though this would

need to be studied. There is a risk that if many of the barrier reef islands are developed with offshore outfalls, there may be some potential to contaminate reefs on the outer atolls such as Turneffe, Lighthouse and Grovers Reef. Oceanographic studies of currents and modeling of the discharges, possibly with a 20-50 year planning horizon could provide estimates of such risks.

In all cases, water quality (nutrient levels) and reef monitoring (e.g., percentage live/dead coral & percentage algal cover) are critical once a solution/technology has been selected and implemented.

8.6.5.1 Deep well injection, Key West, Florida – failure of a high tech solution

Massive algal blooms smothered coral reefs around Key West, Florida, in the 1980s and 1990s. The cause was clearly identified as being from the sewage outfall (USEPA, 1999 *In:* Goreau, 2003a). A grass roots campaign led by the local Reef Relief NGO succeeded in forcing government authorities to build an advanced wastewater treatment system (Quirolo, 2002 *In:* Goreau, 2003a) with deep well injection into the ground beyond where it could contaminate groundwater and eventually nearshore waters. In the last few years, the epiphytic algal forests that had killed almost all the corals in nearby reefs such as Eastern Dry Rocks have died back and the coral is now starting to recolonize the clean bottom (Goreau, 2003a). However, Goreau (2003a) worries that deep well injection simply causes sewage to flow underground and re-emerge elsewhere. Widely used in Florida, instead of solving the problem they are killing the reefs where the water re-emerges at sea (Bacchus, 2002 *In:* Goreau, 2003a).

The question is how deep does the sewage need to be injected so that it cannot possibly resurface to contaminate nearshore waters? Engineering firms can sample and model these requirements in the design of such systems. A key

concern here would be the costs involved in constructing and operating such a system in poor developing countries, making the appropriateness of such systems very questionable.

8.6.5.2 Inland aquifer discharge, Caribbean

On islands like the Bahamas, Barbados and Antigua with limestone (karst) geology, a shallow inland discharge will eventually reach the coast via a groundwater flux to the nearshore, similar to effluent from septic tanks. Pollutant transport modeling in Barbados for the West Coast Sewerage Project indicated that inland aquifer recharge using secondary treated sewage via absorption wells would eventually result in significant loading of nitrogen at the coastline. It was concluded that nutrient removal would be necessary even for inland disposal (Sealy, 2002).

8.6.5.3 Land discharge of sewage

Goreau (2003a) recommends this. However, land-based discharge normally requires secondary treatment prior to use (USEPA, 1976; DeGeorges, 1990a). Once treated, the wastewater effluent can be discharged on land (USEPA, 1976):

- For irrigation through sprinkler systems which removes 98% of the BOD, 80% of the COD, 98% of the suspended solids, 80% of nitrogen, 95% of phosphorus, 95 % of metals and 98% of micro-organisms by the soil/plant system;
- Through overland flow where secondary effluent is sprayed over the upper edge of a sloping terrace flowing slowly downhill through grass and vegetative cover. Clay and clay loam soils are best with results for removal from secondary treated effluent of 92% of the BOD, 92% of

the suspended solids, 70-90% of nitrogen, 40-80% of phosphorus and 50% of metals; and/or

- Infiltration-inflow to recharge groundwater through percolation on spreading basins resulting in the removal of 85-99% of the BOD, 98% of the suspended solids, 0-50% of nitrogen, 60-95% of phosphorus and 50-95% of the metals (insignificant nutrient removal – may not be appropriate).

The advantages are that an advanced degree of waste treatment is attained, the wastewater and nutrients are used productively, and little or nothing should return to the nearshore waters. Once again, the limiting factor may be the ability of a developing country to maintain and operate a secondary treatment system, the history of which is poor. There are also a number of potentially limiting factors with regard to irrigation and land treatment of effluent that must be addressed.

Storage Ponds

Even in the tropics, storage ponds may be necessary during the rainy season when land disposal may not be possible. To obtain a high degree of nitrogen removal, that effluent should be applied to land only during the season of active crop growth (USEPA, 1976) – which in the tropics could be most of the year, though this application is limited during the rainy season (four to five months). Storage lagoons able to hold effluent during the non-productive period and/or the rainy season when the soil would be saturated with water would be required.

Land Availability for Irrigation

A sizeable land area is required, which many tropical islands do not have but which continents may have. USEPA (1976) provides two examples, one of a 15

MGD secondary effluent irrigating 2,300 acres (958 ha) of crops (wheat, barley, oats, rye, sorghum and cotton) and the other of 43.4 MGD of secondary effluent irrigating 6,300 acres (2,625 ha) of a 10,000 acre farm to grow corn. However, in the latter example, samples collected in under-drains still contained 0.05 mg/l phosphorus and 3.2 mg/l nitrogen. These examples amount to about 60-64 ha/MGD of secondary effluent. Similar land areas would likely be needed for the other land disposal systems of from 100-600 acres (41-243 ha)/MGD of effluent (USEPA, 1976).

Heavy Metal Contamination of Crops from Effluent Irrigation

Certain crops can concentrate heavy metals, which could cause plant toxicity problems (e.g. copper and zinc if municipal and industrial sewage are mixed, and from boron linked to detergents in municipal sewage) (USEPA, 1972).

Viral, Bacterial and Parasitic Contamination of Crops and People from Effluent Irrigation

Primary (preliminary) treated sewage should not be used to irrigate crops for human consumption. The USEPA advises that only crops that are to be used for canning or similar processes be irrigated with secondarily treated effluent – which implies no irrigation with secondary effluent of fresh produce (USEPA, 1972).

Helminth (e.g., ascariasis, fascioliasis, cysticercosis and tapeworm) ova and parasitic worms as well as *Schistosomiasis* have been known to survive sewage treatment processes and chlorination, although epidemics traced to crop contamination have not been shown linked to irrigation with treated effluents. The use of furrow and sub-irrigation can further reduce the risk of worker and/or crop contamination (USEPA, 1972).

Viruses can survive chlorinated secondarily treated effluent. If sprinkler irrigation is used, this could contaminate crops and workers. Likewise, it would not be wise to use such effluent on golf courses where clients could be contaminated (USEPA, 1972); though spraying at night might be considered.

Nutrient Removal from Irrigation and Other Land Disposal Methods

The amount of wastewater that can be applied is determined by balancing the nutrient load of wastewater against the nutrient removal capacity of the soil (USEPA, 1972) and vegetation. The soil tends to have a tremendous ability to remove phosphorus so that this should not limit irrigation with effluent. The nitrogen load needs to be balanced against crop removal (USEPA, 1972), the main means of removing nitrogen (USEPA, 1976).

If the vegetation grown is for livestock feed, care must be given that nitrate does not accumulate in the stems and leaves to toxic levels (USEPA, 1972). In areas with karst geology, surrounding groundwater and nearshore waters would likely need careful monitoring to make sure that nutrient contamination does not occur – though monitoring should be a part of any system to assure its effectiveness.

Thus, land discharge of sewage, for any number of reasons, does not appear appropriate unless this is on East Africa's mainland and pumped well inland from the coast possibly for agricultural irrigation. The coastal zone is being planned for development south of Maputo between Mozambique and South Africa in the vicinity of the Maputo Elephant Reserve. As an alternative to coastal discharges, this area has extensive wetlands that could possibly be part of a secondary treatment/overland flow system, with the already nutrient rich wetlands polishing the final effluent. This would require modeling and monitoring to insure the

integrity of the wetlands. On small islands, land, among other issues, would be a major limiting factor.

8.6.6 Examples of Land-Based Treatment and Discharge of Sewage

8.5.6.1 Land-based treatment, Palawan, Philippines, lessons for Africa

The El Nido resorts on islands off the northwest coast of Palawan, Philippines, have standard secondary sewage treatment plants whose effluent is used to water the resort plants and inland forests. Reefs directly offshore from where the sewage effluents are applied show no more algae near than away from the site, because all the nutrients are being absorbed by the land vegetation (Goreau, Goreau, & Cervino, 1997 *In:* Goreau 2003a).

8.6.6.2 Land-based treatment, Akumal, Mexico, lessons for Africa

The diving resort town of Akumal in Mexico has all of the hotels in town on advanced wastewater gardens designed by Mark Nelson, Gonzalo Arcila and associates to absorb all their nutrients as a means of protecting the coral reefs. The strategy is failing because the entire coastline is under uncontrolled development without appropriate sewage treatment, so the Akumal reefs are being over-grown with algae fertilized by nutrients from surrounding development. This points out the need to have treatment of all sources affecting the reefs, not just some of them (Goreau, 2003a).

8.6.6.3 Failed attempts at land-based treatment, Negril, Jamaica

Negril, at the western tip of Jamaica, has the largest beach on the island. Because of a large swamp next to it, it was completely undeveloped since it was

unreachable by land until 1960 when roads were put in and the swamp drained. With tourism slowly developing by the mid-1980s, the epiphytic algae was confined to the mouths of two canals draining the swamps, where they were sharply zoned by species in concentric rings around the point sources of nutrients (Goreau, 2003a).

In the next five years, the tourism expanded to cover the entire beach and the algae began to kill corals across the entire bay. The local divers, the Negril Coral Reef Preservation Society, and later the Negril Environmental Protection Trust, alarmed at the sudden and rapid decline of the reefs, asked Goreau²⁰⁸ to be their advisor to document the algae problem (Goreau, 1992c *In:* Goreau, 2003a). The European Union (EU) offered to fund a sewage treatment plant (Jelier & Roberts, 1992 *In:* Goreau, 2003a). The local NGOs insisted that sewage from the entire watershed needed to be collected and since secondary sewage treatment did not remove nutrients, asked that biological tertiary treatment be included (Goreau, 1993 *In:* Goreau, 2003a), which the EU refused. The sewage collection system only collected the sewage from the hotels and villas along the shore, but excluded the hill villages and slums where the vast majority of the population lived. As a result, the vast bulk of sewage in the watershed was not collected by the sewage plant.

The sewage plant design consultants refused to include tertiary treatment, on the (incorrect) grounds that this was too complicated and expensive for a small island developing state, and was not needed anyway. The claim that tertiary treatment was too complicated and expensive was based on expensive temperate climate systems, highly prone to failure when used to remove nutrients by chemical and microbiological means (Goreau, 2003a).

²⁰⁸ Dr. Thomas J. Goreau President Global Coral Reef Alliance, 37 Pleasant Street, Cambridge, Massachusetts 02139, USA, Telephone: 617-864-4226, 617-864-0433, E-mail: goreau@bestweb.net, Web site: <http://www.globalcoral.org>

The history of maintaining secondary (e.g., Montego Bay Trickling Filter Plant, hotel package plants) let alone tertiary treatment is well known all over the Caribbean. It is possible that land-based treatment of secondarily treated effluent would have worked, which is what Goreau advocated (Goreau, 2005) – but there is a question of linking in all residents of the watershed to the sewage system and the size of land needed to irrigate/dispose of the effluent. Furthermore, on this side of the island, as with Montego Bay, the littoral zone is very narrow and depending on the currents, one could run an offshore outfall with preliminary treatment or a deepwater outfall modeled to assure that the likelihood of sewage and associated nutrients returning to the coast would be small. This is being used off of Barbados and Grenada. Barbados probably has done more to assess appropriate sewage disposal technology for small islands and the tropical coastal zones than anywhere else in the world. Exhaustive studies in Barbados demonstrated that an advanced preliminary plant with a long outfall was shown to be the least cost alternative, which would protect coral reefs and other nearshore environments, as well as address public health problems. It was shown in relatively exhaustive studies that an outfall positioned outside of the bank reefs would take advantage of strong offshore currents and would have minimal impact on marine ecosystems. The project was designed and constructed to take advantage of the assimilative capacity of the ocean (Sealy, 2002) and it is this low maintenance low cost option that Goreau seems to ignore.

Regardless, the refusal to sewer all residents meant that Negril's coral reefs would be a write-off (Lapointe & Thacker, 2002 *In:* Goreau, 2003a), succumbing to epiphytic algae similar to the principal author's assessment of Montego Bay. Water quality studies conducted in every reef, mangrove, river, wetland, spring and groundwater body in the entire western Jamaica watershed indicated that over 99% of all sites were already above the nutrient eutrophication limits (Goreau &

Goreau, 1997 *In:* Goreau, 2003a). After the sewage treatment plant went in, the nutrients continued to increase (Lapointe & Thacker, 2002 *In:* Goreau, 2003a) and the algae continued to kill the corals (Porter, Porter, Porter, Thacker, Nlack, Gabbidon, Getten, Quirolo, Marcinek, & Dustan, 2002, *In:* Goreau, 2003a).

The lesson here, as with Montego Bay, is that even when the problem is understood, it is useless if those who control money and policy refuse to act responsibly. Ironically, despite its failure, this effort to manage the nutrients of an entire coastal zone and watershed as a single unit (Goreau, Daley, Ciappara, Brown, Bourke & Thacker, 1997 *In:* Goreau, 2003a) led directly to USAID's "ridge to reef" program and to the UN "hilltop to ocean (H₂O)" programs. However, Goreau (2003a) feels that these programs

"will be doomed to failure if they simply continue to pursue cosmetic projects that are not broad enough to eliminate ALL of the nutrient inputs to the coastal zone from the adjacent watersheds. Much more serious and comprehensive approaches are needed to restore the health of coral reefs, especially in small islands that are so critically dependent on their marine resources".

These are similar conclusions to those of the principal author in the case study on Montego Bay (Section, 8.6.2, Montego Bay, Marine Park or Marine Cemetery? A Lesson for Africa).

8.6.7 Possible Solutions for Sewage Discharge from Tourism Development and Cities of East Africa

The major reef systems off East Africa include

"the complex barrier and island reef systems of northern and southern Tanzania (800 km long) and northern Mozambique (800

km); the narrow fringing reefs of southern Kenya (200 km); smaller isolated reefs along the southern Mozambique coast (500 km) to South Africa (150 km); and patchy reefs in northern Kenya and southern Somalia (500 km)" (Obura, Church, Daniels, Kalombo, Schleyer & Suleiman 2004 *In: Wilkinson, 2004*).

Since much of East Africa has a narrow littoral zone, the depth dropping off very quickly, preliminary treatment with a long outfall, the location based on proper oceanographic studies, may be a very cost-effective solution. This may be able to serve many hotels and/or cities with one outfall or at least minimal outfalls depending on the size of the city and/or population being served.

A low-cost option that should be strongly considered for the Cays of Belize and much of the coastal zone along East Africa and the islands of the southwestern Indian Ocean is to remain on septic tanks, but keep the tourism low volume exclusive high-paying within the assimilative capacity of the environment to absorb the pollution. A careful study would need to be undertaken of soils, percolation rates, height of the groundwater table after rains (a high groundwater table after rains could cause septic tank malfunctioning and direct discharge of sewage into coastal waters) and the dilutional capacity of the surrounding coastal zone. This may require the use of a sanitary engineers, soil scientists, groundwater specialists and ecologists, with the installation of appropriate mounded septic systems developed for coastal areas with high water tables, situated well inland, along with a long-term water quality and reef-monitoring program – all a part of the cost of doing business if long-term sustainability is desired. People are looking to escape from the polluted rat race of the Western urban cities and should be willing to pay for such environmentally conserving programs through higher user fees and the chance to dive on pristine coral reefs.

If low tourist volume septic systems and/or higher tourist volume preliminary treatment with a long-outfall fail to solve the problem of nutrient pollution and

high algal cover, it may be due to additional pollution from a degraded watershed and/or regional pollution as seen off of Belize (see Section 8.5.1.3, Increase in land-based pollution from within Belize's frontier and Section 8.5.1.4, Possible increase in land-based pollution from outside Belize's frontier). Once again, protection of coral reefs, at a minimum, will require a watershed approach and in many cases a regional approach.

The higher technical solutions mentioned above are available, but are costly to build and would require a highly paid technician to run and operate them, even in the case of preliminary treatment with a long ocean outfall.

Africa does not need built-out areas as on many islands in the Caribbean. Low volume exclusive tourism may be Africa's and the southwestern Indian Ocean's niche in the global coastal tourism market. Florida and the Caribbean are for the most part over-developed, their marine ecosystems are highly degraded, and thus they could never compete with areas that are developed to maintain pristine nearshore conditions.

However, Goreau (2005) states,

"very few places have done so (Maldives, The Seychelles, Mauritius, Nevis, some of the Grenadines) but they have not avoided local pollution (especially Mauritius lagoons). Almost everywhere else, when the first hotels (usually set up by foreigners) are seen to make money all the locals rush to copy them, and the result is an unplanned slum with out of control pollution".

This comes down to educating decision-makers and then political will in overcoming short-term goals of stimulating the economy versus maintaining the long-term ecological and economic integrity of the area. Unfortunately, today,

short-term decision-making appears to be the trend on land (e.g., wildlife & timber) and by the sea!

8.7 KEY SPECIES OF EPIPHYTIC ALGAE ASSOCIATED WITH LAND-BASED NUTRIENT POLLUTION

Goreau (2003a) notes, “the role of nutrient gradients in controlling algae abundance and species composition has generally failed to be recognized by marine biologists...algae show more clearly zoned patterns along gradients than any other group of coral reef organisms, and so are the best bio-indicators of coral reef health of all except for live coral cover. Unfortunately the information needed to interpret them has never been published, and it is of the greatest importance to do so, in order to allow the great amount of information to be gained from their study to be more widely applied”.

Goreau (2003a) feels that

“algae distributions are in fact a better indicator of nutrient inputs than the nutrient concentrations themselves. The reason for this is that nutrients vary very quickly in space and time as the pattern of water movement shifts with currents, tides, winds, and waves, and because they can be rapidly taken up by algae. If seriously eutrophic waters remain over a reef for long enough, algae will remove most or all of the nutrients. As a result a eutrophic reef can have low measurable nutrients in the water, because they have been taken up and are part of the algae biomass, to be released again when the algae dies and decomposes”.

From personal observations by the principal author in the Caribbean, the most susceptible corals to algal overgrowth are the staghorn (*Acropora cervicornis*), the elkhorn coral (*Acropora palmata*) and finger coral (*Porites* spp.).

“*Acropora palmata* (elkhorn coral), *A. cervicornis* (staghorn coral) and *A. prolifera* (fused-staghorn coral) were the dominant reef-

building corals on reefs of Florida and throughout the Caribbean for the past half-million building years. These species have suffered an 80 – 98% decline over the last 30 years throughout vast portions of their range, causing major losses in coral cover...The Center for Biological Diversity in San Francisco, filed a petition with the USA government in March 2004 requesting that these species be protected under the federal Endangered Species Act (ESA)" (Wilkinson, 2004).

As is discussed below, many of these *Acropora* spp. corals died from "White Band" disease (see Section 8.10.2, Coral Diseases). In this case, algal-over-growth may have been a secondary impact on an already dead or dying coral linked to pollution.

The least susceptible are the gorgonians (*Gorgonia* spp.) and fire coral (*Millepora* spp.). Eventually, all of the hard corals and the gorgonian fan corals (e.g. *Gorgonia ventalina* and *G. flabellum*) begin to succumb to this phenomenon as the nutrient pollution progresses. Where the principal author has observed this as a problem, the most common genera of benthic (epiphytic) macroalgae that turn coral reefs into algal reefs include (DeGeorges, 1990a):

- Turbinaria* sp., a brown algae, family Cystoseiraceae
- Lobophora variegata*, a brown algae, family Dictyotaceae
- Dictyota* spp., a brown algae, family Dictyotaceae
- Halimeda* spp., a green algae, family Halimedaceae
- Amphiroa* sp., a red algae, family Corallinaceae

Wilkinson (2002) notes that large increases in macroalgae, mainly *Lobophora* sp. and *Dictyota* sp. on Caribbean coral reefs, prevent the recruitment and settlement of coral larvae. Although there is limited quantitative data, these are common algae found on the coral reef, which in nutrient enriched conditions appear to take up this new human-induced niche, out competing corals for space. Similar

assessments are needed off of Africa. The principal author noted the brown algae *Turbinaria* sp. and *Sargassum* sp. as apparent nutrient pollution indicators off of Mahé and St. Anne Marine Park, the Seychelles (DeGeorges, 1990b). Off Sri Lanka, Rajasuriya (2002 *In:* Linden, Souter, Wilhelmsson & Obura, 2002) found that overgrowth by *Halimeda* spp., various filamentous algae and sedimentation appear to inhibit recruitment and growth of corals.

Goreau (2004d; 2005) believes that the above epiphytic algae observed by the principal author are largely characteristic of low (*Turbinaria* sp., *Amphiroa* sp., *Halimeda* sp.) to moderate (*Dictyota* spp., *Lobophora* sp.) nutrient pollution, but they are among the first to increase strongly as nutrient inputs increase. They are then replaced by other species as nutrients become higher. These replacement algae identified by Lapointe, *et al.* (2004) and Goreau (2004d) as a result of land-based nutrient pollution include:

Dictyosphaeria cavernosa, a green algae, family Valoniaceae

Ulva fasciata, green algae, family Ulvaceae

Digenea simplex, red algae, family Rhodomelaceae

Laurencia intricata, red algae, family Rhodomelaceae

Goreau (2004d) explains that the top two algae on this list are indicative of the highest nutrient concentrations, while the bottom two are indicative of slightly lower but still high levels of nutrient pollution.

8.8 SEDIMENTATION AS A KEY COMPONENT OF LAND-BASED POLLUTION

For similar reasons as increased epiphytic algal growth from nutrient pollution, increases in sedimentation can result in either decreased photosynthesis of the

zooxanthellae by cutting off sunlight and/or smothered coral polyps, making it difficult to feed. In both cases, smothering the reef with a blanket of algae or a blanket of sediment, the results are similar. The coral reef starves to death (DeGeorges, 1988a; 1989b; Wood, *et al.*, 1975; Johnson, *et al.*, 1988 all *In:* DeGeorges, 1990a; Evans, 2002).

“In Southeast Asia, Burke *et al.* (2002 *In:* Buddemeier, *et al.*, 2004) calculated that more than 21% of all coral reefs are threatened by sedimentation from land-based sources, primarily due to logging and poor agricultural practices. McCulloch Fallon, Wyndham, Hendy, Lough and Barnes (2003 *In:* Buddemeier, *et al.*, 2004) used coral skeletal records (1750–1998) to show that sediment delivery to the near-shore central Great Barrier Reef increased 5 to 10-fold with the introduction of European agricultural practices. These findings support the contention that significant portions of the Great Barrier Reef suffer chronic anthropogenic sediment stress (Wolanski, McCook & Sweatman, 2003 *In:* Buddemeier, *et al.*, 2004). Local dumping, dredging, land reclamation, mining, and construction activities can also result in increased sedimentation or resuspension of sediment in the marine environment” (Buddemeier, *et al.*, 2004).

8.8.1 Wetland Losses, Coastal Sedimentation and Solid Waste Pollution Associated with Urbanization in the Caribbean, Lessons for Africa

The problem of solid waste and the impacts resulting from inadequate disposal methods is a regional problem in the Caribbean and not a direct result of tourism (UNECLAC 1986), although addressing this issue becomes that much more critical if tourism is to become a major economic force in the region. East Africa will be faced with similar solid waste disposal problems as its coastal tourism develops. As affluence has reached the Caribbean islands, a growing middleclass and second homes for North American/Europeans have resulted in conversion of prime farmlands into suburbia. Little attention has been paid to solid waste (often dumped into guts-perennial stream beds) or to appropriate landscaping. In many

urban areas, garbage is collected and dumped into coastal wetlands (Johnson, *et al.*, 1988; Cambers, 1988; UNEP, 1988 all *In: DeGeorges, 1990a*):

- Directly into the sea at Choc Bay, Castries and into Soufriere Bay, Anse Chastinet in St. Lucia;
- Into a mangrove wetlands near St. Georges in Grenada;
- Into the Great Heed salt pond/mangrove system in St. Kitts;
- Into the sea at Port Elizabeth, Bequia;
- Into the Flashes mangrove system in Barbuda;
- Into a mangrove swamp on Ambergris Cay;

This physically destroys these wetlands. In many cases wetlands are filled-in (e.g., salt ponds and lagoons) and/or eliminated (e.g., mangroves) by developers.

Coral reef degradation is even greater in areas where the loss of wetlands has reduced nature's ability to filter nutrients and other pollutants before they reach the coral reef (Evans, 2002). Leachates from dumpsites also contaminate coastal waters with toxic pollutants (MAB, 1989 *In: DeGeorges, 1990a*). In most cases, these dumps are eyesores, within easy viewing of major tourist routes. The net result, when major rain events occur, is heavy sediment loads and other associated contaminants flushed into the sea on most Caribbean islands. One has to only visit a coastal area after a rain event to observe the brown ring and floating garbage encircling these islands. Not only is there a major public health risk from this runoff, but nearshore corals are also being smothered by such pollutants. This can also be occurring from malfunctioning septic tanks being exasperated during rain events. On a number of the islands, the U.S. embassy warns against swimming at such times.

Plastic pollution is a major problem in the Caribbean and after most rain events is commonly found in coastal tourism waters. Not only is this bad for tourism, but certain species of sea turtles (e.g., the loggerhead) are known to mistakenly ingest plastic for jellyfish and die. Plastics pollution became such a problem that in September 1988, the Texas land commissioner made a special trip to attend the Regional Seas Conference sponsored by UNEP in Mexico City. He pleaded with the Caribbean states to help control plastics pollution. Given the clockwise movement of currents in the Gulf of Mexico, these plastic wastes were washing up on the shores of Padre Island, Texas, destroying the aesthetic value of its beaches for tourism (DeGeorges, 1990a).

From October 27 – November 1, 2003, a UN Experts Meeting on Waste Management in Small Island Developing States was held in Havana, Cuba to look at solid waste disposal and sewage issues.

8.8.2 Coastal Sedimentation Affecting the Coral Reefs of Belize, Lessons for Africa

See above case study on land-based pollution, (see Section 8.5.1.3, Increase in land-based pollution from within Belize's frontier and Section 8.5.1.4, Possible increase in land-based pollution from outside Belize's frontier). This land-based pollution may be crossing international boundaries and affecting the second largest barrier reef in the world, figures varying from 201 km (125 mi.) (Smith, 1971) to 240 km (149 mi) (Littler, Littler, Bucher & Norris 1989) to 250 km (155 mi) long (Almada-Villela, McField, Kramer, Kramer & Arias-Gonzalez, 2002 *In: Wilkinson*, 2002). Pollution of mainland Tanzania could impact Zanzibar and visa versa, or pollution of Mahé, the Seychelles may be impacting islands just off its coast (see Section 8.12.1, Land-Based Pollution and Coral Reef Degradation Mahé, the Seychelles).

8.8.3 Sedimentation Associated with Sugar Cane, Lessons for Africa

On islands traditionally dominated by sugar cane such as Barbados and St. Kitts, the youth are turning away from manually cutting cane and large-scale mechanization is taking over. As in most parts of the world, this results in changed land use managed to handle large combines. Fields are enlarged and many traditional practices that would have minimized soil loss are abandoned (Oxenford, *pers. comm. In:* DeGeorges, 1990a). Personal observations by the principal author indicate that many of St. Kitts' coral reefs are smothered in sediment and/or sugar cane waste [see Table 8.6: Typical sewage treatment systems and impacts on coral reefs observed by principal author in the Caribbean (1989-1990)].

8.8.4 Sedimentation Associated with Banana Production, Lessons for Africa

In 1990, Britain had been subsidizing bananas for about 25 years on the Windward Islands of Grenada, St. Vincents, St. Lucia and Dominica: "Bananas are king". High quality bananas are produced by a few plantations located on suitable flatlands. The amount of land suitable for bananas is quite limited. As a result, the small-scale farmer is pushed onto land that is steep sloped and should not be farmed. Squatting on Crown lands is a problem on many of these islands and is resulting in a loss of tropical forests, which are important from the standpoint of biological diversity and as watersheds for the islands' drinking water supplies (Miller, Fugita & Ford, 1988 *In:* DeGeorges, 1990a).

Bananas do not adequately hold soils on these steep slopes. Additionally, herbicides, such as paraquat, are used to keep the under storage vegetation around banana trees to a minimum, leaving the ground bare and exposed for the most

part. When rain events occur, often severe and short in duration, huge quantities of sediment are washed into the coastal zone, creating a brown ring around these islands. This not only reduces light penetration in the water column, but eventually this sediment settles out, smothering the corals and sea grasses. The once beautiful El Cahuita Coral Reef off of Costa Rica is reputedly dead from heavy sedimentation associated with small-scale farmers producing bananas on steep slopes in the watershed that drains this reef (*Zadroga, pers. comm. In: DeGeorges, 1990a*).

8.9 IMPACTS OF PESTICIDES AND FERTILIZER FROM LAND-BASED POLLUTION ON CARIBBEAN CORAL REEFS, LESSONS FOR AFRICA

As Africa evolves into more intensive agriculture, pesticides washing into coastal areas could become a problem. Very little is known about the degree to which pesticides and fertilizers are a problem in the Caribbean. This, like sedimentation and nutrient pollution from sewage, is not monitored on most islands. Pesticides analysis requires sophisticated instrumentation and trained technicians to operate them. At the time of this evaluation in the late 1980s, a number of the islands had skilled technicians and inoperable gas chromatographs. This is due to a failure by decision-makers to perceive the need for such analyses. However, this was beginning to change, as the need to monitor residual pesticide levels on export crops became an economic necessity and because of an increasing awareness by the island communities that pesticide contamination, both direct (contamination of farm workers) and indirect (contamination of islanders from consumption of contaminated drinking water, vegetables, meat and seafood), was a major public health risk to the future of islands' residents. Pesticide control boards were becoming more active in controlling what pesticides were allowed into their countries. There was an increasing desire to assure that farm workers were

properly trained in safe pesticide handling and disposal. There were a number of instances reported from St. Vincent and Dominica where farm workers washed down contaminated pickup trucks or pesticide containers in local streams resulting in fish kills. On many of the “banana islands” (e.g., Grenada, St. Lucia, St. Vincent and Dominica), tremendous amounts of pesticides were used, primarily in banana production (DeGeorges, 1989c) (Table 8.8):

Table 8.8: Pesticide use in the Caribbean, 1988/89

Island	Annual Use of Pesticides (Active and Inert Ingredients)	Number of USEPA Restricted Pesticides
Grenada	102,040 kg (224,488 lb) (1988)	20
St Vincents	412,127 kg (906,679 lb) (1988)	10
St. Lucia	354,083 kg (759,182 lb) (Jan.-Oct. 1989)	13
Dominica	1,066,233 kg(2,345,712 lb) (1988)	11

Source: DeGeorges (1989c)

This comes out to 5.2-7.2 pounds of active ingredients per acre (2.7-3.7 kg/ha) in production per year compared to 23 pounds of active ingredients/acre in production/year (25.5 kg/ha) in San Joaquin County, California, known as one of the most intense areas for pesticide use in the world. The most commonly used USEPA restricted pesticides in the Caribbean at the time included the nematocides furadan (carbofuran), mocap (ethoprop) and vydate (oxamyl) and the herbicide gramoxone (paraquat) (DeGeorges, 1989c).

The Caribbean Environmental Health Institute conducted a study of pesticides and other toxic contaminants in St. Lucia's coastal waters. The findings were so shocking that the report has never been released. The Bellairs Research Institute found high levels of chlordane and other pesticides in coastal sediment, seagrass and in seaegg eggs (A local urchin, or “seaegg”, *Tripneustes ventricosus*, whose eggs are considered a local delicacy) (Hunte, 1989 *In:* DeGeorges, 1990a). Fish flesh was not analyzed. This pesticide had been banned from use in Barbados for

about ten years. It is a chlorinated hydrocarbon and very persistent in the environment. It is believed that this is only the tip of the iceberg. As there was an increasing awareness of the danger from agrochemicals and monitoring becomes more routine, it is likely that the severity of this problem will become better understood, both from a human and ecological prospective.

With regard to the impacts of fertilizer use on the coastal environment, this has not been quantitatively studied. On the Windward Islands, tremendous quantities of fertilizer are used in producing bananas. For instance on St. Lucia, it is estimated that 1,000 metric tons of N/P/K fertilizer are imported each month (DeGeorges, 1989c). Monitoring of streams and rivers draining agricultural lands into coastal waters will ultimately be required if the degree of nutrient and pesticide pollution in the coastal environment is to be ascertained. Coastal marine sediment, coral, seagrass and fish flesh also need to be monitored to determine if pesticides are bio-accumulating through the food chain.

8.10 OTHER CAUSES FOR CORAL REEF DEGRADATION

One of the major problems with much of the concern about what is happening to the coral reefs of the world is that there is insufficient quantitative data to scientifically and categorically state for each reef the exact cause of degradation. It is very important to establish long-term coastal monitoring programs so that this need can be met. Nevertheless, other causes of coral reef degradation include (DeGeorges, 1990a; Evans, 2002; Lazaroff, 2002):

- **Global ocean warming and coral bleaching;**
- **Coral diseases;**
- **Invasive species introduction;**
- **Coral and the aquarium trade;**

- **Sea urchin dieback** resulting in increased algal overgrowth due to the loss of this algal grazer;
- **Over-fishing of algal grazers**, such as parrotfish, contributing to increased algal growth covering the reefs;
- **Boat anchor, vessel groundage and diver damage;**
- **Sewage associated with sailboats and yachts; and**
- **Dredging and shoreline modification.**

Although global and regional issues must be addressed, for many other reasons than just coral reef dieback, there is a danger that they will obscure the more immediate and pressing issue of addressing land-based pollution. Furthermore, they do not lend themselves to immediate actions in which positive benefits may be observed. These issues also make it too easy for decision-makers to ignore doing anything about land-based pollution by using factors that are out of their control as the major reason for the coral reef's demise.

8.10.1 Global Ocean Warming and Coral Bleaching

Goreau (1997) and Goreau, Hayes, Clark, Basta and Robertson (1992, *In Geyer, 1992*) believed that coral reefs worldwide showed clear signs of severe stress due to high ocean temperatures over the last 15 years and would be unable to tolerate a further global warming of 1° C in surface air temperatures. Goreau (1998) considers elevated ocean temperatures of this warming phenomenon a greater threat than all other causes of coral reef degradation including sedimentation of soils eroded from deforested hill slopes, overgrowth by algae fertilized by sewage runoff, physical damage from dredging, boats, anchors and tourists, and from over-fishing.

It appears that beginning about 1988, global ocean warming may have become every bit as much of a threat to the health of coral reefs as land-based pollution, resulting in massive coral bleaching (Figure 8.5). Dr. Tom Goreau (2002), president of the Global Coral Reef Alliance, had this to say about global warming and coral reefs at a presentation made at the World Summit on Sustainable Development (WSSD).

“Ten years ago in Rio de Janeiro we were the only ones who warned the governments of the world that failure to immediately halt global warming would result in most corals dying of heat stroke in the coming decade. Instead of acting decisively to save our most precious and beautiful marine resources, they adopted a worthless Framework Convention on Climate Change to stabilize not global temperatures, but the rate of temperature increase, thereby condemning the world’s reefs to death even if they had lived up to their commitments, and violating the goal of the Convention to protect the most climatically-sensitive ecosystems.

Since then most of the world’s coral has died “from heatstroke across the entire Indian Ocean and the Northwest Pacific in 1998, from heatstroke across the entire South Pacific in 2002, from heat shock, soil erosion, strangulation by algae over-fertilized by sewage and fertilizers, and from diseases in the Caribbean, and from the devastating use of bombs and poisons for fishing in Indonesia, the Philippines, and Southeast Asia, the richest reefs of all, the underwater Amazon Jungle and Congo Rainforest rolled into one. The first global human climate change caused ecosystem extinction is now well underway. It will not be the last. It is now too late to derail or delay the disaster. While the overall dimensions of the catastrophe are already clearly evident, the details of when and where remain unpredictable... With increasing temperatures, corals are dying, and the reefs are no longer able to grow to match rising sea level, just as sea level rise, now several millimeters per year, is starting to accelerate. As mountain glaciers melt and as polar ice caps are lubricated from below by melt water, there could be sudden unpredictable surges as ice suddenly slides into the ocean. Tropical countries, surrounded by dead and dying reefs, have lost their ability to resist increased storm waves and flooding that will follow. Old ecosystems and fisheries will be disrupted and die before new ones can replace them. Only a few

places on the coldest edges of reefs, like South Africa, will benefit as corals slowly spread away from warmer areas, but it will take thousands of years for these reefs to mature, if they are left undisturbed..." (Goreau, 2002).

8.10.1.1 Coral bleaching and its causes

Coral bleaching is the whitening of corals that occurs when the zooxanthellae are lost from coral tissues or the amount of photosynthetic pigment in the zooxanthellae is sharply decreased. Because corals can only survive in a limited range of conditions, a slight temperature increase over a prolonged period can result in bleaching. Stresses from pollution (e.g., nutrients, sedimentation), high levels of light, infections, excess shade and fluctuations in salinity levels are also associated with incidents of coral bleaching (Williams & Williams, 1990 *In:* Goreau, Cervino, Goreau, Hayes, Hayes, Richardson, Smith, DeMeyer, Nagelkerken, Garzon-Ferrera, Gi, Garnison, Williams, Bunkley-Williams, Quirolo, Patterson, Porter & Porter, 1998; Glynn, 1991; Kushmaro, Loya, Fine & Rosenberg, 1996 *In:* Goreau, *et al.*, 1998; U.S. Dept. of State, 1998c; Pomerance, 1999; Turner, 2002; Fitt, McFarland, Warner & Chilcoat, 2000; Fitt, Brown, Warner & Dunne, 2001 *In:* Buddemeier, *et al.*, 2004). While most bleached colonies die, those that survive stop growing and reproducing (Pomerance, 1999; U.S. Dept. of State, 1998c; 2001; Turner, 2002; Mendes & Woodley 2002 *In:* Buddemeier, *et al.*, 2004). Goreau and Hayes (2005b) note reduction in organic and gaseous nutrient for the coral, low rates of sexual reproduction, cessation of tissue growth and halting growth of limestone skeleton as a result of thermal damage to the zooxanthellae followed by its expulsion.

Goreau and Hayes (1994) were among the first scientists to report the impacts of increasing ocean temperatures on mass coral bleaching. If the sea surface temperature (SST) increased 1° C for a month or longer above the long-term

average for the warmest months/season, the period was termed “a hot spot” and usually resulted in mass bleaching of coral reefs. Threshold temperatures were found “higher at sites with higher mean temperature, indicating that coral populations are adapted to local conditions. Mass bleaching was reported in some of the coldest and hottest coral reef areas, showing that both are vulnerable” (Goreau & Hayes 1994). They ruled out pollution as mass bleaching was occurring on pristine reefs as much or more than on coral reefs exposed to land-based pollution (Goreau & Hayes, 1994). Goreau and Hayes (2005a) have been able to demonstrate that satellite images of SST are accurate enough to correlate with mass coral bleaching. If these conditions last only one month and it then cools down, almost all corals will gradually recover. If excessively hot surface water conditions persist for two to three months or if surface water temperatures reach 2° or 3° C above average for one month, coral mortality becomes significant (Goreau, 1998). In the Caribbean, once seawater temperatures reach about 30° C for a few weeks, corals can begin experiencing “bleaching”, the degree of bleaching appearing to increase with the length of period of elevated surface water temperatures (Goreau, *et al.*, 1992 *In:* Geyer, 1992). Monthly average sea surface temperatures in the Seychelles normally do not get much over 29° C, but in 1998, they stayed over 30° or 31° C for at least five months (Goreau, 1998).

El Niño-Southern Oscillation events have increased in frequency and intensity over the last few decades. This combination of global warming and intense El Niño events has resulted in a dramatic increase in coral bleaching (Goreau, *et al.*, 1992 and Glynn, 1993; Brown, 1997; Wilkinson, 2000 all *In:* Buddemeier, *et al.*, 2004). “Analyses of global satellite-derived SST anomalies and coral reef bleaching reports since 1982 show that both are rapidly increasing”. Supra-threshold events, where a combination of global warming appears to be driving El Niño events above regional temperature thresholds in those areas with strong

positive El Niño Southern Oscillation Index (ENSO) correlations. Impacting over 100 countries, if warming continues, bleaching events may become an annual recurrence,

“placing many reef tracts at high risk of catastrophic mass mortality from bleaching. These changes are concurrent with declining live coral cover, ecosystem function, and economic values of coral reefs from both emerging diseases and other anthropogenic and natural stresses, but have greatly exceeded their cumulative impact in 1998” (Goreau & Hayes, 2005b).

8.10.1.2 Global ocean warming, Caribbean and Pacific

In 1982-83, 70-95% of the corals in Costa Rica, Panama, Colombia, and the Galápagos Islands died because of bleaching caused by the warm waters brought by El Niño (ENSO) (movement of currents affecting on- and offshore-temperatures). The death of some species of corals removed protection against predators such as the crown of thorns starfish. Increased erosion of the coral skeletons by sea urchins resulted in destruction of these reefs that continues today. Erosion of reef frameworks in Panama has exceeded 1 inch per year. Many of these reefs have still not recovered and the bleaching subsequently moved on to many areas of the Caribbean and western Atlantic Ocean. In the late 1980s and early 1990s, bleaching became a regular and pervasive problem in the Caribbean and began to appear in the Pacific and Indian Oceans -- often related to El Niño events. During the El Niño of 1997-98, bleaching began in the eastern Pacific but then expanded to an unprecedented, alarmingly broad region across the Indian Ocean from Kenya to Indonesia and in the Pacific Ocean from Australia to Polynesia. Bleaching reports continue in the fall of 1998, now across the western Atlantic basin. This increase in bleaching corresponds to increased ocean temperatures that have been seen across the tropical Pacific and Atlantic since 1976 (U.S. Dept. of State, 1998c; Pomerance, 1999).

8.10.1.3 Global ocean warming and coral bleaching, Western Indian Ocean

Coral bleaching occurred in the western Indian Ocean as a result of increased sea surface temperatures over a period of a couple of months in 1998 (Warrick, 1999). Goreau (2005) states,

“I warned all of these groups you cite across the Indian Ocean that bleaching was about to happen before they could see it in the field, and made sure that people were alerted in time to see the first changes. Due to the political need to control money and credit, Wilkinson and Linden moved in to take over, and deliberately cut out all reference to the fact that all of these teams had been previously warned by us. My 3 reported studies in the Seychelles were the only ones in the world to look at the same transects before, during, and after bleaching”.

Wilkinson (2004) explains that this was a one in 1,000 year event in many places with no recorded history of such events, though there is concern that such events will become much more commonplace in the next 50 years linked to global climate change. Many 1,000-year old corals died. Preliminary data indicate that more than 70% of corals died off across a wide region of the Indian Ocean, from the coast of Kenya to the Lakshadweep Islands off southern India (Warrick, 1999). In the Maldives, post-bleaching data in 1998 shows the mean cover of live coral was 2.1%, ranging from 1.0% - 3.1% among surveyed atolls compared to pre-bleaching levels of between 46.5% and 37.4% (Zahir, 2002 *In:* Linden, *et al.*, 2002). Off Sri Lanka, mortality reached 50-100% among shallow corals, while corals deeper than 10 m appear to have recovered (Rajasuriya, Maniku, Subramanian & Rubens 1999; Wafar, 1999; Rajasuriya & Karunaratna, 2000; Zahir, 2000 all *In:* Wilhelmsson, 2002 *In:* Linden, *et al.*, 2002). Nearly all corals of the dominating genus *Acropora* and also *Echinopora lamellosa* died and the reef was covered with filamentous algae (Rajasuriya & Karunaratna, 2000 *In:*

Wilhelmsson, 2002 *In:* Linden, *et al.*, 2002). Off East and Southern Africa, this included the following:

- Surveys in Kiunga and Malindi (Kenya), Misali and Mafia (Tanzania) and Pemba and Inhaca (Mozambique) showed that 90–100% of the corals died after exposure to water temperatures that exceeded 32°C, mainly in March and April 1998. In most affected areas, the cover of algal turf on dead or bleached coral increased significantly, as much as a 200% increase was noted on Kenyan reefs (CORDIO, 1999);
- Wilkinson (2002) estimates a loss of up to 80% live coral on Kenyan and Tanzanian reefs with very slow recovery, particularly on reefs with direct human pressures. Obura, Celliers, Machani, Mangubhai, Mohammed, Motta, Muhandu, Muthiga, Pereira and Schleyer (2002 *In:* Wilkinson, 2002) estimate 50-90% coral mortality off Kenya/Tanzania;
- In Kenya, there was an 80% or greater bleaching and mortality rate, below 10m there was a less than 50% mortality in northern Kenya (Linden, *et al.*, 2002);
- The coral mortality rate was more than 80% in the Mafia Marine Park off Tanzania (Warrick, 1999; Linden, *et al.*, 2002); and
- Bleaching and mortality levels were less than 1% in South Africa (Schleyer & Celliers, 2002 *In:* Linden, *et al.*, 2002; Obura, *et al.*, 2002 *In:* Wilkinson, 2002). However, a protracted period of elevated temperatures with high levels of irradiance caused by exceptional water clarity elicited measurable bleaching in 2000, at a critical temperature of ~28.8°C continuously over about four to five days, about 2 degrees less on these sub-tropical reefs than the tropical reefs further north (Schleyer & Celliers, 2002 *In:* Linden, *et al.*, 2002; Wilkinson, 2002).

There has also been apparently some recovery off East Africa, though other areas appear to continue declining in coral cover (Table 8.9).

Table 8.9: Percent coral cover during 1997/98 (pre-bleaching), 1999 and 2001/02 at monitoring sites in East Africa			
	1997/98	1999	2001/02
KENYA			
-Northern Kenya (>10 m deep)	-	5.7	1.2
-Northern Kenya (< 3 m deep)	13.2	5.1	9.9
-Southern Kenya (Protected)	39.6	11.4	19.5
-Southern Kenya (Unprotected)	20.6	11.4	14.4
-Overall	26.3	8.1	11.25
TANZANIA			
-Tanga	53.0	33.3	-
-Pemba	53.7	12.3	16.3
-Unguja	45.8	32.0	37.9
-Kunduchi	43.0	35.0	-
-Mafia	73.3	19.4	24
-Songosongo	35.0	37.5	-
Mnazi Bay	60.0	20.0	-
Overall	52.0	27.1	26.1
MOZAMBIQUE			
-Quirimbas	-	48.4	35
-Mozambique I.	-	32.5	30
-Bazaruto	-	69.5	65
-Inhambane	-	13.8	7
-Inhaca	-	50.0	40
-Overall	-	42.8	35.4
Source: Linden, <i>et al.</i> (2002) with permission, Olof Linden, Coral Reef Degradation in the Indian Ocean (CORDIO) Coordinator.			

Obura, *et al.* (2002 *In:* Wilkinson, 2002) state that degraded reefs outside marine protected areas (MPAs) of East Africa severely damaged by the 1997/8 El Niño event have recovered 50-100% of pre-bleaching coral cover. This does not say that they have recovered 50-100%, but that they are 50-100% of what they were before the bleaching which could be good if anthropogenic influences have been reduced but could mean further degradation if land-based pollution (e.g., from

coastal development) and other human impacts (e.g., dynamite fishing) have not been removed. Recruitment of corals to the reefs has been moderate, with highest levels on protected reefs with high coral cover and diversity. In 2001-2002, additional damage to East Africa reefs included floods in Mozambique, algal blooms off Tanzania and Kenya and an unknown fungal disease of corals off Kenya and northern Tanzania (see Section 8.11.1, Coral Degradation off East Africa). It is noted (Wilkinson, 2002) that:

- Recovery is only slow to moderate along the East African coastline and in the Comoros, Seychelles and Maldives particularly where reefs are stressed by sediments and nutrients and there are insufficient protected areas to ensure coral reef sustainability; and
- Madagascar, Mauritius and Reunion escaped most of the 1998 bleaching; however, reefs under more human pressure are declining, especially on Madagascar.

Obura *et al.* (2004 *In: Wilkinson, 2004*) and Wilkinson (2004) found that for East Africa 30% of the reefs declined from bleaching with a slow recovery due to human population pressures further exacerbated by increases in fishing pressure. Recovery of corals since 1998 is estimated at about 30-50%; however, recovery has been very patchy with many depleted reefs showing no recovery.

“However, many of the reefs that have shown ‘full recovery’ to pre-bleaching levels had displayed signs of human induced degradation prior to the bleaching. The apparent rate of recovery was more rapid on these degraded reefs, but only on coral communities that already had lost many slow growing and vulnerable coral species and was instead dominated by opportunistic (*Pocillopora*, *Stylophora*, branching *Porites*) and stress resistance species (massive *Porites*, *Coscinaraea*, *Pavona*). In contrast, the reefs showing the least recovery since 1998 are those that were in better health prior to bleaching. Recovery on these reefs has been affected by chronic and local threats,

including over-fishing, crown-of-thorns starfish (COTS - *Acanthaster planci*) infestations and repeated minor bleaching events" (Obura *et al.*, 2004 *In: Wilkinson, 2004*).

Wilkinson (2004) notes off East Africa that "the growing coastal population of 22 million (people) poses the largest threat to the reefs, with land-based activities and over-fishing increasing. There have been significant improvements in the management of coral reef MPAs in the last 2-4 years..." (Tables 8.3, 8.9 & 8.10).

CATEGORY	Kenya	Tanzania	Mozambique	South Africa	Region
1. Seriously damaged or totally destroyed	10	10	10	0	7.5
2. Strong recovery since 1998	30	30	30	NA	30
3. High Risk: clear damage	30	20	20	10	20
4. Medium Risk: moderate damage	30	30	10	30	25
5. Low Risk: healthy & relatively stable	0	10	30	50	22.5
Significance of categories					
1 = 90% of the coral are gone & unlikely to recover soon					
3 = 50-90% loss of corals & likely to join "Category 1" in 10 to 20 years					
4 = Moderate signs of damage – 20-50% loss of corals & likely to join "Category 1" in 20 to 40 years					
NA = Not applicable, as there were no losses in 1998					
Source: Obura, <i>et al.</i> (2004 <i>In: Wilkinson, 2004</i>) with permission, AIMS.					

In this case recovery implies that a quantity of coral off East Africa was bleached, losing its zooxanthellae, but did not die, eventually recovering as temperatures declined and/or different monitoring techniques and/or monitors were introduced, resulting in different interpretations. In fact, Goreau (2005) states that much of the recovery in the western Indian Ocean is about surviving coral recovering, mostly *Porites spp.*, with actual recruitment being very low in most places.

With a projected coastal population growing from 10-15 million in 1994, 22 million in 2004 to 39 million by 2014, with the potential for more bleaching

events, the future prognosis for coral reefs off the East African Coast is poor (Obura *et al.*, 2004 *In:* Wilkinson, 2004) unless land-based pollution and fishery management issues are properly addressed.

Based on willingness of tourists to pay/day to see healthy reef, losses from this global warming event were estimated to be US\$ 71.5 million for the Seychelles, US\$ 47.2 million for Mombassa and US\$ 39.9 million for Zanzibar alone in net present values over a 20-year period with a 10% discount rate (Linden, *et al.*, 2002).

Coral reefs in the five states of the southwestern Indian Ocean Island Node collectively cover an area of 5,270 km² and are very important for coastal protection, especially from the frequent strong cyclones south of 10° South (Ahamada, Bijoux, Bigot, Cauvin, Koonjul, Maharavo, Meunier, Moine-Picard, Quod & Pierre-Louis, 2004 *In:* Wilkinson, 2004):

- Coral mortality ranged from 50–90% over extensive areas of shallow reefs in the Seychelles, Comoros, Madagascar and Chagos. In some areas (around Mahé, the Seychelles), mortality was close to 100%, with algal turf covering much of the reefs by the end of 1998 (CORDIO, 1999);
- Comoros experienced over 55% of the corals dying, Madagascar 30% and Mauritius 1 to 15%. (Linden & Sporrong 1999 *In:* Payet, Soogun, Ranaivoson, Payet & Abdallah, 2003);
- The Seychelles was perhaps the most severely affected, with live coral cover on the granitic islands reduced to less than 10% (90% die-off or more) in some areas (Linden & Sporrong 1999 *In:* Payet, *et al.*, 2003). Goreau (1998) estimates that at 14 sites in the Seychelles 50-90% of the coral was recently killed by high surface water temperatures, while Warrick (1999) records 75% mortality in the Seychelles; and

- Localized bleaching was recorded in 2001 around Reunion and in March 2002 around Rodrigues and the Seychelles (Ahamada, *et al.*, 2002 *In: Wilkinson*, 2002).

Similar observations were made by Goreau, Hayes and McClanahan (2000).

Very high settlement of new corals in Indonesia, low rates in the Maldives and very low rates in the Seychelles were being observed in 2003/2004 (Goreau, 2004f), so there is some recovery. Linden, *et al.* (2002) discuss some recovery since the 1998 die-off across the Indian Ocean.

Wilkinson (2004) notes in the southwestern Indian Ocean (e.g., the Seychelles, Comoros, Reunion, Mauritius, Madagascar) that

“there has been some recovery of coral reefs, which had been reduced to less than 5% coral cover in 1998. However, recent bleaching damage to the new coral recruits is slowing recovery. Alongside these, there are some exceptional sites that were highly resilient to the bleaching damage; but human stresses and natural disturbances pose a constant threat to these reefs”.

By 2014,

“if management does not improve and there are repeats of the recent climate-related stresses, it is predicted that most reefs in the region will have less than 20% live coral cover by 2014. Many species of corals and fish will be locally extinct due to losses from coral bleaching and over-exploitation of some fish and invertebrate species” (Ahamada, *et al.*, 2004 *In: Wilkinson*, 2004).

A detailed island-by-island analysis of the status of coral reefs and reef fishes is provided by Ahamada, *et al.* (2004 *In: Wilkinson*, 2004).

8.10.1.4 Possible expansion of coral distribution from global warming

As discussed in Section 8.2.7.1 Temperature, colonial reef-building coral reefs are found at temperatures above 16-18° C (61-64° F). Global warming may extend the range of corals into areas that are currently too cold (Precht & Aronson, 2003 *In: Buddemeier, et al., 2004*), a 2°C (4°F) warming of the oceans expanding the range by a few degrees latitude. Locations within this region that have suitable depth, substrate and other environmental conditions could potentially support new coral reefs at the higher temperatures. However, even with warmer waters, there are other physical limitations that will limit the expansion of coral reefs (*Buddemeier, et al., 2004*):

- The west coasts of North and South America, Europe and Africa experience upwellings and cool water flowing toward the equator; and
- Along the coasts of the southeastern United States (also the Gulf of Mexico) and near the Amazon River, reef expansion will be blocked by muddy coastal shelves, river deltas and turbid water.

Wilkinson (2004) hypothesizes that

“the possibility of coral reefs migrating to higher latitudes towards the poles is unlikely, as there are few suitable broad continental shelves in these latitudes and corals rely on photosynthetic energy from their symbiotic zooxanthellae. They will not receive sufficient sunlight energy during the higher latitude winters”.

Similarly Goreau, Hayes and McAllister (2005) conclude that in areas with increased upwelling due to global climate change, corals may survive in cooler waters or waters where warming is slowest,

"however they will persist in marginal coral communities, not constructional coral reefs, due to increased competition from algae and filter feeders", likely due to the fact that upwelling areas tend to be rich in nutrients giving epiphytic algae and ahermatypic corals a comparative advantage over reef-building (hermatypic) corals - "temperate waters are too eutrophic to permit healthy reef growth even if temperatures were adequate".

Otherwise hermatypic coral reefs found in equatorial regions, occupying the warmest habitats that will likely become warmer,

"are going extinct because there is no place for organisms already adapted to warmer habitats to migrate from" (Goreau, *et al.*, 2005).

Thus,

"only southern China, Japan, Australia, and southern Africa offer realistic opportunities for reef expansion. Additionally, sea surface temperature (SST) gradients are very steep in the vicinity of 18°C (the annual minimum temperature threshold for coral reef growth), and ocean model projections suggest that SST warming associated with doubled CO₂ will only move the 18° C contour by a few hundred kilometers, especially in the critical western boundary areas (Kleypas, Buddemeier & Gattuso, 2001 In: Buddemeier, *et al.*, 2004). The overall positive effects of warming on habitat availability and ecosystem distribution will be very minor compared to the overall negative effects" (Buddemeier, *et al.*, 2004).

Even if corals could expand into these areas, one must ask how many 100s or 1,000s of years it would take for them to develop the structures that current reefs have built up over 10,000 of years of the interglacial period (Buddemeier, *et al.*, 2004).

"The other major mechanism is for corals to adapt or acclimate to rising temperatures, and there is encouraging early evidence, that corals may be able to swap their symbiotic algae for more temperature resistant ones and continue to

grow in higher water temperatures" (Wilkinson, 2004). However, Goreau (2005) believes that claims of coral adaptation or zooxanthellae switching is not supported by available data. He explains that corals cannot adapt physiologically, do not change their zooxanthellae and if they could this would need evolutionary time, which we are not giving them.

8.10.1.5 Future global warming

There is concern that burning of fossil fuels will continue to result in rising air temperatures globally and thus increasing ocean temperatures (Table 8.11).

VARIABLE	OBSERVED RANGES		PROJECTED RANGES	
	1880 (Pre-Industrial)	2000	2050	2100
CO₂ (parts per million by volume - ppmv)	280	367	463-623	478-1,099
Global Mean Temperature				
Centigrade (°C)	---	+0.4 – 0.8	+0.8 – 2.6	+1.4 – 5.8
Fahrenheit (°F)	---	+0.7 – 1.4	+1.4 – 4.7	+2.5 – 10.4
Sea Level				
Meters (M)	---	+ 0.07 – 0.15	+ 0.05 – 0.32	+ 0.09 – 0.88
Feet (Ft.)	---	+0.23 – 0.49	+0.16 – 1.0	+0.29 – 2.88
Note: Year 2050 and 2100 temp. and sea level increases against Year 2000 baseline				
Note: The Centigrade versus Fahrenheit data shown is not a direct conversion based on the formula: F = (9/5 x C) + 32, (e.g., one cannot take 0.8 and convert it to 1.4), but the relative increase in temperature within a given temperature range within one system at a ratio of about 1.8. For instance if the temperature increased from 10 to 12 °C, the difference is 2°. In Fahrenheit, they increased from 50 to 53.6, a difference of 3.6 °F at a ratio of 3.6/2 = 1.8 that appears to be a relative constant.				
Source: Extracted from Buddemeier, <i>et al.</i> (2004) with permission, Pew Center on Global Climate Change.				

8.10.1.6 Global warming, human-made versus a natural cycle

The impacts of global warming are something that must be dealt with at international levels such as through the Kyoto Protocol to the United Nations

Framework Convention on Climate Change. Land-based pollution is something that individuals and communities can actually put their fingers on and do something about. There are still major debates as to the causes of global warming. One of the biggest opponents of what many scientists see as a politicization of the global warming issue is Dr. Richard S. Lindzen, Sloan Professor of Meteorology at the renowned Massachusetts Institute of Technology (MIT) Department of Earth, Atmospheric and Planetary Sciences. Lindzen (2001a) in a presentation to the U.S. Senate Environment and Public Works Committee stated that where there is widespread agreement among scientists is:

- “That CO₂ levels have increased from about 280 ppm (parts per million) to 360 ppm over the past century...
- That the increase in global mean (air) temperature over the past century is about 1°F (0.34°C)...
- That doubling CO₂ alone will only lead to about a 2°F (0.68°C) increase in global mean (air) temperature...
- That the most important energy source for extra-tropical storms is the temperature difference between the tropics and the poles which is predicted by computer models to decrease with global warming...Consistent with this, even the IPCC (the United Nation’s Intergovernmental Panel on Climate Change) Policymakers Summary notes that no significant trends have been identified in tropical or extra-tropical storm intensity and frequency. Nor have trends been found in tornados, hail events or thunder days (from global warming)...
- That temperature increases observed thus far are less than what models have suggested should have occurred even if they were totally due to increasing greenhouse emissions...
- That claims that man has contributed any of the observed warming (i.e. attribution) are based on the assumption that models correctly predict natural variability. Such claims, therefore, do not constitute independent verifications of models. Note that natural variability does not require any external forcing²⁰⁹ – natural or anthropogenic;

²⁰⁹ Climate forcing is defined as an imposed perturbation of the earth's energy balance. Climate forcing is typically measured in watts per square meter (W/m²). The sensitivity of the climate system to a prescribed forcing is commonly expressed in terms of the global mean temperature

- That large computer climate models are unable to even simulate major features of past climate such as the 100 thousand year cycles of ice ages that have dominated climate for the past 700 thousand years, and the very warm climates of the Miocene, Eocene, and Cretaceous. Neither do they do well at accounting for shorter period and less dramatic phenomena like El Niños, quasi-biennial oscillations, or intra-seasonal oscillations – all of which are well documented in the data;
- That major past climate changes were either uncorrelated with changes in CO₂ or were characterized by temperature changes which preceded changes in CO₂ by 100s to thousands of years;
- That increases in temperature on the order of 1°F (0.34°C) are not catastrophic and may be beneficial; and
- That Kyoto, fully implemented, will have little detectable impact on climate regardless of what one expects for warming. This is partly due to the fact that Kyoto will apply only to developed nations. However, if one expected large global warming, even the extension of Kyoto to developing nations would still leave one with large warming”.

A National Academy of Sciences (NAS) (NAS, 2001) review of global warming including the IPCC report concluded that greenhouse gases are accumulating in the earth's atmosphere because of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Of the greenhouse gases that are directly influenced by human activity, the most important are carbon dioxide (CO₂), methane (CH₄) – 19%, water vapor (H₂O), ozone (O₃), nitrous oxide (N₂O), and chlorofluorocarbons (CFCs including CFC-12 (CCl₂F₂) and CFC-11 (CCl₃F). Changes observed over the last several decades are mostly due to human activities, but cannot rule out that some significant part of these changes is also a reflection of natural variability.

change that would be expected after a time sufficiently long for both the atmosphere and ocean to come to equilibrium with the change in climate forcing.

Human-induced warming and associated sea level rises are expected to continue through the 21st century. Significant increases have been recorded of (NAS, 2001):

- CO₂ (increase from 280 ppmv pre-industrial to ~370 ppmv today);
- CH₄ (1% per year increase from 1978, until about 1990. The rate of increase slowed and became more erratic during the 1990s); and
- N₂O (increasing approximately 13% increase in the past 200 years).

Global warming rates as large as 2°C (3.6°F)²¹⁰ per millennium may have occurred during the retreat of the glaciers following the most recent ice age. Global mean surface air temperature warmed by about 0.4-0.8°C (0.7-1.5°F) during the 20th century. The ocean, which represents the largest reservoir of heat in the climate system, has warmed by about 0.05°C (0.09°F) averaged over the layer extending from the surface down to 10,000 feet, since the 1950s. Climate change simulations based on IPCC emissions scenarios yield a globally-averaged surface air temperature increase by 2100 of 1.4 to 5.8°C (2.5 to 10.4°F) relative to 1990 (NAS, 2001).

There is general agreement that observed warming is real and particularly strong within the past 20 years. Whether it is consistent with the change that would be expected in response to human activities is dependent on what assumptions one makes about the time history of atmospheric concentrations of the various forcing agents, particularly aerosols. Predicted warming is larger over higher latitudes than over low latitudes, especially during winter and spring, and larger over land

²¹⁰ Note: The Centigrade versus Fahrenheit data shown in NAS (2001) is not a direct conversion based upon the formula: $F = (9/5 \times C) + 32$, (e.g., one cannot take 0.8 and convert it to 1.4), but the relative increase in temperature within a given temperature range within one system at a ratio of about 1.8. For instance, if the temperature increased from 10 to 12 °C, the difference is 2°. In Fahrenheit, they increased from 50 to 53.6 a difference of 3.6 °F, at a ratio of $3.6/2 = 1.8$ that appears to be a relative constant.

than over sea. Rainfall rates and the frequency of heavy precipitation events are predicted to increase, particularly over the higher latitudes. Higher evaporation rates would accelerate the drying of soils following rain events, resulting in lower relative humidities and higher daytime temperatures, especially during the warm season. Because there is considerable uncertainty in current understanding of how the climate system varies naturally and reacts to emissions of greenhouse gases and aerosols, current estimates of the magnitude of future warming should be regarded as tentative and subject to future adjustments (either upward or downward). Because of the large and still uncertain level of natural variability inherent in the climate record and the uncertainties in the time histories of the various forcing agents (and particularly aerosols), a causal linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes during the 20th century cannot be unequivocally established (NAS, 2001).

In a Wall Street journal article (Lindzen, 2001b), Dr. Lindzen goes on to summarize conclusions of the U.S. National Academy of Sciences (NAS) report (NAS, 2001), of which he was one of eleven contributing scientists,

“We are quite confident: (1) That global mean temperature is about 0.5°C (0.9°F) higher than it was a century ago; (2) That atmospheric levels of carbon dioxide have risen over the past two centuries; and (3) That carbon dioxide is a greenhouse gas whose increase is likely to warm the earth (one of many, the most important being water vapor and clouds). But -- and I cannot stress this enough -- we are not in a position to confidently attribute past climate change to carbon dioxide or to forecast what the climate will be in the future. That is to say, contrary to media impressions, agreement with the three basic statements tells us almost nothing relevant to policy discussions...Distinguishing the small recent changes in global mean temperature from the natural variability, which is unknown, is not a trivial task. All attempts so far make the assumption that existing computer climate models simulate natural variability, but I doubt that anyone really believes this assumption. We simply do not know what relation, if any, exists between global climate changes

and water vapor, clouds, storms, hurricanes, and other factors, including regional climate changes, which are generally much larger than global changes and not correlated with them. Nor do we know how to predict changes in greenhouse gases...My own view, consistent with the panel's work, is that the Kyoto Protocol would not result in a substantial reduction in global warming".

More recently, some have claimed major flaws in temperature change models (Muller, 2004). The American Meteorological Society (AMS, 1990) concluded that

"at present, observations suggest, but are insufficient to prove, that atmospheric warming caused by human activities has already occurred. Climate models, which are simplified mathematical representations of the complex climate system, are the principal means available to predict or project the magnitude, timing, and spatial distribution of global climate change. General Circulation Models (GCMs), the most comprehensive physically-based models of the climate system, currently provide the best estimates of future global warming. These suggest that global warming will occur, though the magnitude and timing of this warming are debatable. However, even the most comprehensive present day models now in existence have significant limitations. These limitations, which are expected to diminish as model improvements occur, could be masking elements which would produce greater warming or could be causing over-estimates of the warming to be anticipated".

The American Geophysical Union (AGU, 2003) official position on global warming, "Human Impacts On Climate Change" includes but is not limited to the following.

"...Scientific evidence strongly indicates that natural influences cannot explain the rapid increase in global near-surface temperatures observed during the second half of the 20th century. Human impacts on the climate system include increasing concentrations of atmospheric greenhouse gases, air pollution, increasing concentrations of airborne particles, and land alteration. A particular concern is that atmospheric levels of carbon dioxide

may be rising faster than at any time in Earth's history, except possibly following rare events like impacts from large extraterrestrial objects...Mid-continent warming will be greater than over the oceans, and there will be greater warming at higher latitudes. Some polar and glacial ice will melt, and the oceans will warm; both effects will contribute to higher sea levels. The hydrologic cycle will change and intensify, leading to changes in water supply as well as flood and drought patterns...The complexity of the climate system makes it difficult to predict some aspects of human-induced climate change: exactly how fast it will occur, exactly how much it will change, and exactly where those changes will take place...model projections of future global warming vary, because of differing estimates of population growth, economic activity, greenhouse gas emission rates, changes in atmospheric particulate concentrations and their effects, and also because of uncertainties in climate models... AGU believes that no single threshold level of greenhouse gas concentrations in the atmosphere exists at which the beginning of dangerous anthropogenic interference with the climate system can be defined...AGU encourages scientists worldwide to participate in climate research, education, scientific assessments, and policy discussions. AGU also urges that the scientific basis for policy discussions and decision-making be based upon objective assessment of peer-reviewed research results...Scientific research is required to improve our ability to predict climate change and its impacts on countries and regions around the globe. Scientific research provides a basis for mitigating the harmful effects of global climate change through decreased human influences (e.g., slowing greenhouse gas emissions, improving land management practices), technological advancement (e.g., removing carbon from the atmosphere), and finding ways for communities to adapt and become resilient to extreme events”.

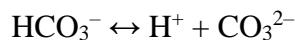
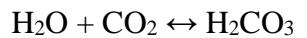
A 2004 conference on global warming hosted by the American Association for the Advancement of Science (AAAS, 2004) raised major concerns over humans' acceleration of global warming.

The climate change debate has become corrupted by politics, the media and support for research depending on alarm (Dr. R.S. Lindzen In: Morano, 2004). The IPCC (2007) comes out strongly in favor of humans having a major impact

on climate change from increases in green house gas emissions; carbon dioxide primarily to fossil fuel use and land-use change, with methane and nitrous oxide primarily due to agriculture. However, a U.S. Senate (2007) report featuring 400 prominent peer-reviewed scientists from diverse fields, a number among the 52 scientists participating in the 2007 IPCC Summary for Policymakers, urges caution over what degree human's are the major cause of global warming. The debate will continue, but regardless of the cause or degree of the cause; natural, human-induced or a combination thereof, global ocean warming has been devastating to coral reefs and in the long-term may impact on their distribution.

8.10.1.7 Increased CO₂ (carbon dioxide) levels impacting coral growth

A second concern associated with the burning of fossil fuels, in addition to global warming, is increased carbon dioxide (CO₂) levels. Increasing atmospheric CO₂ drives more CO₂ into the ocean, lowering the pH²¹¹ (making the ocean more acidic) and changing the relative proportions of the three forms of carbon: CO₂ (dissolved CO₂ and carbonic acid - H₂CO₃), bi-carbonate (HCO₃⁻) and carbonate (CO₃²⁻).



Under pre-industrial conditions in the tropics, about 85% of dissolved CO₂ was in the form of bicarbonate and 15% in the form of carbonate. Doubling the CO₂ levels in sea water in these tropical areas, assuming salinity at 35 ppt. and 25°C over pre-industrial levels, could result in 90% taking the form of bicarbonate and 10% of carbonate, which would reduce the calcification process in corals which

²¹¹ pH is a measure of free hydrogen ion activity not bound by carbonate or other bases in water, pH = -log₁₀ [H⁺], where [H⁺] is hydrogen ion activity. A pH of 7 is neutral, while below a pH of 7 indicates increasing acidic conditions and above indicates increasing basic conditions

combine calcium and carbonate to form calcium carbonate: $\text{Ca}^{+2} + \text{CO}_3^{-2} \leftrightarrow \text{CaCO}_3$ that forms the coral skeleton. During these pre-industrial conditions, pH levels, a reflection of acidity and of shallow ocean waters, were slightly basic at 8.15 decreasing today to about 8.05 (Buddemeier, *et al.*, 2004).

Higher atmospheric CO₂ increases ocean acidity (e.g., lowers the pH) and lowers the concentration of carbonate which corals and other marine organisms use, in the form of calcium carbonate, to build their skeletons. Thus,

“continued growth in human emissions of CO₂ will further limit the ability of corals to grow and recover from bleaching events or other forms of stress...In laboratory experiments that simulate doubled atmospheric CO₂ conditions, coral calcification rates decrease by 11–37%” (Buddemeier, *et al.*, 2004).

On the other hand, increasing temperature, as long as it is below the upper threshold limit, increases coral calcification rates from: 1) increased coral metabolism and 2) through photosynthesis by zooxanthellae. So far, growth of coral reef from increased temperatures has been greater than losses from increasing acidity.

“Field experiments (Halley & Yates, 2000 *In:* Buddemeier, *et al.*, 2004) indicate that the dissolution rate could equal the calcification rate once atmospheric CO₂ concentrations reach double the pre-industrial levels, (which would occur some time around 2050). This points to a slow-down or reversal of reef-building and the potential loss of reef structures in the future” (Buddemeier, *et al.*, 2004).

Similarly, Schleyer and Celliers (2002 *In:* Linden, *et al.*, 2002) conclude that

“a further build-up of the atmospheric CO₂ that is causing climate change is expected to reduce the marine aragonite²¹² saturation state globally, leading to a commensurate decline in reef formation

²¹² Aragonite is a mineral of calcium carbonate (CaCO₃) composing the skeletons of scleractinian reef-building corals

and the scleractinian (reef building corals) composition in coral communities”.

Wilkinson (2002) states that to date there has been no field evidence of corals having reduced calcification and growth rates from increased CO₂ concentrations in seawater, though research in Biosphere II, Arizona and in other mesocosm (enclosed chambers with controlled environments) studies demonstrates this possibility if atmospheric CO₂ concentrations continue increasing in the 21st century. It is predicted that coral reefs will not become extinct, but that humankind will witness reductions in coral cover and species diversity and economic value if these models are correct from global warming impacts including disease and bleaching. Furthermore, “the ‘resilience’ of a reef to withstand natural stress from cyclones or bleaching has decreased over the past 200 years under the negative impacts of over-fishing and pollution” (Wilkinson, 2002).

Goreau (2005) on the other hands states

“Acidification does reduce calcification, but the reefs will be dead from high temperatures long before this is significant. It is a red herring argument which distracts attention from the imminent dangers”.

8.10.2 Coral Diseases

Scientists are trying to find the causes behind a string of mysterious coral diseases with names like “White Pox”, “Black Band”, “White Band”, “Red Band”, “Yellow Band”, “Coral (white) Plague”, “Dark Spot” and “Rapid Wasting Syndrome”. The names of these diseases describe their visual appearance that divers observe on the surface of corals (e.g., a black or white circular band). Researchers do not yet know if these diseases are caused by viruses, bacteria or fungi, but they suspect that corals stressed by human activities such as pollution,

boat/anchor damage, episodic sediment loading, as well as physical damage by storms, destructive fishing methods and by large marine mammals make corals more susceptible to disease (Goreau, *et al.*, 1998, U.S, Dept of State, 1998d; 2001; Turner, 2002). Goreau, *et al.* (1998) do an excellent job of describing these diseases and the species of corals they attack, as well as diseases of sponges, coralline algae, sea urchin and sea fans. So far, only the Black Band and White Pox diseases appear to be strongly correlated with human sewage (Goreau, 2005).

“Black Band” disease. Goreau, *et al.*, (1998) found only “Black Band” disease to be strongly correlated with human pollution. Littler, *et al.* (1989) indicate that “Black Band” disease is the result of shallow reef-building coral being attacked by the blue-green algae, *Phormidium corallyticum*, called a cyanobacteria by Goreau, *et al.* (1998). A dense black band of these algae separates the live coral on one side and the dead coral on the other.

“Coral (white) Plague” disease. Two types, slow and fast (cm/day) affecting 18 species of non-Acroporid corals in Florida Keys (Goreau, *et al.*, 1998).

“Dark Spot” disease. Early stages dark spots (purple, maroon and brown in color) in the middle of the normal tissue that gradually dies back forming a ring/hallow surrounding dead tissue. *Siderastrea siderea* Caribbean coral most commonly attacked (Goreau, *et al.*, 1998).

“Rapid Wasting” syndrome. Attacks *Montastrea annularis* and *Colpophyllia natans* corals. Infected tissue often attacked by parrotfish resulting in deep excavation of skeleton (Goreau, *et al.*, 1998).

“Red Band” disease. Cyanobacteria *Oscillatoria spp.* (blue-green algae) impacting *Gorgonia ventalina* by forming a red mat (Goreau, *et al.*, 1998).

“White Band” disease. Also attacking *Acropora cervicornis*, “White Band” disease is what progressively destroyed elkhorn coral, *Acropora palmata* slowly from the base up in the late 1970s to early 1980s throughout the Caribbean (U.S. Dept. of State, 1998d; Goreau, *et al.*, 1998), eliminating up to 95% of the elkhorn and staghorn corals (genus *Acropora*) from some locations; these corals are the dominant reef-builders in shallow water (U.S. Dept. of State, 1998d).

“White Pox” disease. Causes round white spots up to 10 cm in diameter in bare tissue on *Acropora palmata* (Goreau, *et al.*, 1998). “White Pox” disease has also been shown to be associated with the sewage bacteria *Serratia marcescens* in Florida (Goreau, 2005).

“Yellow Band” disease. Cervino, Hayes, Polson, Polson, Goreau, Martinez and Smith (2004) found “Yellow Band” disease to be a bacteria that attacked primarily zooxanthellae in situ resulting in decreased photosynthesis, as opposed to causing bleaching and secondarily adversely impacting growth of *Montastrea spp.* and other corals, the increased incidence correlating with increased sea surface temperatures.

Most likely because of its current underdeveloped coastline, the coral reefs of the East African coast appear relatively free of disease, though this could change quite rapidly if coastal tourism takes off without the appropriate environmental controls in place. Buddemeier *et al.* (2004) point to studies that demonstrate a correlation with increasing ocean temperatures that create a more favorable environment and thus synergistically, along with other factors, increase the corals’ susceptibility to disease. Likewise, Goreau (2005) states,

“the bulk of these diseases are due to pathogens, not “stress” but increased temperature makes them worse. We have now identified

pathogens for around half a dozen coral, gorgonian, sponge, and algae diseases, but little good work has yet been done on the causes of these new diseases in terms of understanding how they have developed new pathogenic behavior in new habitats or how they spread”.

Once this symbiotic relationship between the zooxanthellae and coral polyp is destroyed, as indicated by coral bleaching (Rensberger, 1987; Roberts, 1987; 1988 all *In:* DeGeorges, 1990a), ultimately the coral becomes more vulnerable to disease (e.g., “White Band” and “Black Band” diseases that kill off corals, especially staghorn and elkhorn coral).

Although there is little evidence, many scientists feel that the regional dieback of sea urchins from a viral disease or the “White Band/Black Band” diseases attacking corals in the Caribbean are symptoms of a highly disturbed and pollution stressed ecosystem making the urchin weakened and vulnerable to disease (Ward, 1990; Shinn, 1989 *In:* DeGeorges, 1990a; Buddemeier, *et al.*, 2004). Wilkinson (2002; 2004) states that though evidence is limited, there is a nagging suspicion that many disease outbreaks are inadvertent results of human activity whether through pollution washing off the land, heat stress to corals or through over-fishing the organisms that can control plagues (Wilkinson, 2004). Once again, we come back to land-based pollution as a key determinant of these diseases.

Goreau (2004e) indicates that James Cervino, Ray Hayes and he have papers in press-relating temperature (global warming) and sewage effects on a consortium of four bacteria causing the most widespread coral diseases in the Caribbean. What

“has mistakenly been called bacterial ‘bleaching’ is in fact a bacterial disease of the algae that operates by completely different cellular mechanisms. There are strong temperature interactions that

speed up disease, making disease too easy to confuse with bleaching, and vice versa. But many of these bacteria are land derived pathogens linked with human sewage".

"Diseases of scleractinian or stony corals have increased significantly over the last decade and are causing widespread mortality of important reef-building species. Studies have shown that coral diseases are affecting greater numbers of coral species, are increasing in frequency and distribution, and are spreading to new regions faster than ever recorded in the past. In recent years, there has been an emergence of newly described coral diseases with new types of pathologies or tissue conditions not observed in the past. Several of these diseases also have been recorded as killing coral tissue at rates much faster than ever observed. Coral diseases occur in response to biotic and abiotic stresses. Biotic stresses are instigated by microorganisms including bacteria, fungi, viruses, and protozoans. Abiotic stresses occur in response to physical or chemical stresses, such as increased sea surface temperatures and UV radiation, anthropogenic input of nutrients, sediment, and other pollutants. Abiotic stresses may exacerbate the role of microorganisms in disease processes. Thus, the recent emergence of disease in corals is believed to be a consequence of deteriorating water quality that favors the proliferation of microorganisms, or of a reduced ability of a coral to defend itself against biotic and abiotic stresses. Most diseases appear to be a response to multiple factors" (U.S. Dept. of State, 1998d).

"The recent emergence of multiple diseases and the rapid spread of these afflictions suggest both that the corals have lost the capacity to protect themselves and that the pathogens have adopted novel strategies or have acquired enhanced virulence in the coastal marine environment. It is possible that combined stresses resulting from repetitive episodes of bleaching, exposure to pollution, etc., might account for the increased incidence of diseases of reef organisms now being reported especially in the relatively confined Caribbean region" (Hayes & Goreau, 1997).

"Although coral diseases are damaging reefs around the world, they have been documented most frequently in the Western Atlantic, which suffers significantly from land-based pollution...Coral diseases are also having an impact on other important reef-building corals worldwide, but assessments in regions other than the western Atlantic are limited to a few reefs" (U.S. Dept. of State, 1998d).

Addressing the problem requires several actions (U.S. Dept. of State, 1998d):

- Identification of the causes of diseases, including the role of microorganisms and the relationship of biotic and abiotic stressors;
- Development of standardized terminology to describe and characterize coral diseases;
- Identification of the global distribution of coral diseases, species affected, abundance of diseases and the impact of disease on coral reef structure and function;
- Identification of the natural level of coral diseases to understand whether disease occurrence is being exacerbated by controllable stresses; and
- Development of strategies to mitigate coral diseases.

Because the cause-effects relationships between natural disease-causing organisms and anthropogenic stressors, acting alone or in tandem are largely unknown, the U.S. Coral Reef Task Force (CRTF) will establish a Coral Disease Consortium focused specifically on coral health (U.S. Coral Reef Task Force, 2000).

“If rising temperatures and sea levels were not enough, ocean life is also reeling from other human caused global changes: the over-harvesting that has brought every fishery to the brink of collapse, the proliferation of exotic species, the uncontrolled flood of mud, sewage, fertilizers, garbage, and chemicals that are choking marine life, and now raging epidemics of exotic new diseases that are wiping out one population after another like marine AIDS. Some of these diseases are caused by bacteria, some by fungi, some by viruses, but most remain unknown, yet all seem from their patterns of proliferation to have origins from land, and seem to have been caused by yet unknown interactions between pollutants and

mutations caused by chemicals or selected for in response to them”
(Goreau, 2002).

8.10.3 Invasive Species Introduction

Introductions of invasive species are also of serious concern in some areas, particularly through the discharge of ballast water from visiting vessels that can transport alien species from one region to another (Evans, 2002).

8.10.4 Coral and the Aquarium Trade

“The unsustainable commercial extraction of corals for aquarium and ornamental specimens, jewelry, and construction materials is joining other threats as cause for concern to the biodiversity, structure, and function of coral reef ecosystems. Extraction of corals for curios, jewelry, and the aquarium trade is driven by international demand, with most collection occurring in the Indo-Pacific and most exports going to the United States and Japan. Concern about overexploitation has led the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora to list most coral species in trade on CITES Appendix II, which requires that exporters file trade records including information on the exporting country, taxa, and amount. Pink, gold, and bamboo corals are not currently listed in CITES” (U.S. Dept. of State, 1998e).

“Coral extraction for aquarium and curio trade involves hard corals in the Orders *Coenothecalia* (blue coral), *Milleporina* (fire coral), *Scleractinia* (stony corals), *Stolonifera* (organ pipe corals) and *Styleasterina* (lace corals). Ornamental corals are species with ornate skeletal structures and include the fast-growing, branching corals like *Acropora* and *Pocillopora*. Live corals are primarily large-polyp specimens such as *Euphyllia*, *Goniopora*, *Catalaphyllia*, *Plerogyra*, and *Trachyphyllia*; these corals grow very slowly, have low rates of sexual recruitment, require many years to reach sexual maturity, and include rare and threatened species. Coral for jewelry -- black corals (Order *Antipatharia*) and precious corals (pink, gold, and bamboo corals) -- are deepwater species that occur at very low densities, are recruitment-limited,

and grow very slowly. Precious corals are generally extracted using destructive trawls and tangle-net dredges. Commercial extraction of corals has damaged essential reef habitats and is believed to be causing local depletions of rare species in some areas" (U.S. Dept. of State, 1998e).

"For over three decades, the Philippines was the major supplier of ornamental corals for the international market. A ban on coral exports from the Philippines caused a shift in the export markets, with Indonesia emerging as the largest supplier in the 1990s. Since 1995, coral exports from Fiji, Mozambique, Taiwan, and Tonga have steadily increased; 64 other nations also export live and dead coral. In 1996, coral exports listed in the CITES Trade Database consisted of over 2.5 million pieces of live coral, 670,000 kg of raw coral, and 31,000 colonies of black coral from 114 genera and 181 identified species. Over 90% of the live coral is imported into the United States, and most raw coral is imported into the United States and Japan. Less than 0.02% of all exports are captive-bred corals" (U.S. Dept. of State, 1998e).

The United States imports nearly half of the total worldwide-trade in aquarium fishes, with approximately 67% (two-thirds) originating in the Indo-Pacific. From 15 to 20 million coral reef fishes are traded each year. A 1997 survey of U.S. retailers found that as many as 33-50% of the aquarium fishes imported from Southeast Asia die shortly after arrival. Almost all the aquarium fish are collected using cyanide. Cyanide kills corals at concentrations (50-600 mg/l CN⁻) lower than used by fish collectors (1,500-120,000 mg/l CN⁻) (Cervino, Hayes, Honovich, Goreau, Jones & Rubec, 2003; Goreau, 2005). Improvements in transportation, handling and husbandry of live coral reef species for the marine aquarium trade may also be needed to reduce mortality rates (U.S. Coral Reef Task Force, 2000). Addressing the problem requires several actions and associated capacity building (U.S. Dept. of State, 1998e):

- Identification of coral species involved in the trade and tracking the trade.
- Enforcement of existing laws and regulations;
- Monitoring of harvesting impacts on both shallow and deep reefs;

- Development of alternatives to the wild harvest of corals -- in this respect, recent work on aquaculture of live corals for the aquarium trade appears promising; and
- Development of education programs for consumers on the impact of coral harvesting and possible alternatives.

8.10.5 Sea Urchin Dieback

See Section 8.3.1, Sea Urchin Dieback.

8.10.6 Over-fishing of algal grazers

See Section 8.3.2, Over-Fishing of Algal Grazers.

8.10.7 Boat and Diver Damage

In the Florida Keys, techniques have been developed for permanent moorings at which dive boats are tied off, without dropping anchors. In some cases, the group dives with a dive leader as a unit and the dive boat follows the divers' bubbles or a diver towed buoy, as opposed to dropping anchor or tying off to a permanent mooring. SCUBA divers are among the worst culprits of physical coral damage, especially underwater photographers who tend to stand, lie and sit on the coral, anything to get a shot. Divers need to be educated to not touch or brush up against the coral. The dive master needs to lecture and then be prepared to take action if one of the divers breaks the rules of good conduct that have been laid down. With the establishment of management plans for marine parks, the impacts of tourism (e.g. anchor/diver damage, souvenir collecting, commercial exploitation) should be minimized (DeGeorges, 1990a). Although important to address, it is the principal author's belief, based on what he has observed and based on a minimal amount of quantitative data that these issues cannot compare

to the pressing need to address the damage caused to coral reefs associated with land-based pollution and now global warming.

8.10.8 Sewage Associated with Sailboats and Yachts

In the USA, live-aboard boats must have holding tanks for sewage. This sewage must be dumped in the open sea and/or in harbors where pump-out facilities exist. The pump-out facilities pipe the sewage to wastewater treatment plants. In the Caribbean and in much of the developing world, laws requiring holding tanks and pump-out facilities do not exist. Most live-aboard recreational vessels turn the “holding tank area” into an extra supply of fresh drinking water. Sewage is discharged directly into the sea. The best example of degraded reef as a result of sewage discharge from recreational boats was observed in the Tobago Keys where up to 140 boats a day anchor over the coral reef. It is supposed that Africa has a similar problem, though it is unlikely, other than in a few isolated harbors, that there are enough live-aboard sail boats for this to be a concern at present, though this may change as tourism develops (DeGeorges, 1990a).

8.11 COASTAL DEGRADATION EAST AFRICA AND SOUTHWESTERN INDIAN OCEAN

The distribution of coral reefs off Africa amount to about 7% of the global coral reefs or 19,901 km² (7,684 mi²) (Spalding, *et al.*, 2001). In East Africa,

“total mangrove area is about 600,000-1,200,000 ha, and distribution is correlated with coastal indentation and large river discharge. Over-exploitation and the lack of expertise and institutional management capacity threaten their existence. Seagrass beds are found throughout the region and are under pressure from intensive use of bottom traps and beach seines, explosives fishing, sand mining and dredging” (Jameson, McManus & Spalding, 1995).

The majority of colonial coral reefs are found off the East Coast of Africa and associated islands from the Red Sea to Sodwana Bay, South Africa.

8.11.1 Coral Degradation off East Africa

Over-exploitation of fishery resources has been reported from Tanzania and Mauritius; and reefs off Kenya, Tanzania, and Mauritius suffer from destructive fishing practices (e.g., dynamiting). Trampling of coral by fishermen has also degraded reefs in the region (observed by principal author off Kalifi, Kenya). Coral and coral sand mining in Mafia (Tanzania), Comoros, Mauritius, and Madagascar have damaged reefs. Over 500,000 tons of coral sand is excavated annually from Mauritius, and sand mining has scarred most beaches in the Comoros. Over 250 tons of shells and corals (aquarium trade) were exported from Tanzania in 1974. Exploitive collection has moved from the depleted areas off Tanzania and Kenya to the islands of Zanzibar and Mafia. Sedimentation from agricultural practices is a major problem throughout the region. The problem is critical in the Comoros and has also affected reefs off the Seychelles, Dar es Salaam, and Zanzibar. Eutrophication (nutrient pollution) is a problem in Port Louise, Dar es Salaam, and Zanzibar (Jameson, *et al.*, 1995).

The degradation of the Athi River watershed in Kenya has significantly increased since 1961, destroying large areas of coral reef around the Malindi Reef complex (Dubois, Berry & Ford, 1985 *In:* DeGeorges, 1990a). Obura (2002 *In:* Linden, *et al.*, 2002) notes:

- Over-fishing and destructive fishing (dynamiting, poisoning, small-mesh seines, over-harvesting fish and shellfish), pollution, mining, deforestation and poor land management and poorly managed and planned tourism are

the major localized stresses damaging coral reefs on the East African Coast;

- From December 2001-February 2002, what appear to be red tides [*Karenia mikimotoi* (formerly variously known as *Gymnodinium nagasakiense*) and *G. aureolum*] were observed off Somalia, Kenya, Tanzania, Oman and Yemen, apparently from stronger than normal upwelling and strong onshore currents;
- Shortly after the red tide, an unknown coral disease primarily impacted the genera *Montipora*, *Astreopora* and *Echinopora*, in some areas causing near 100% mortality, but also *Pocillopora*, *Acropora* and *Platygyra*. The disease was identified by electron microscopy as a fungus; and
- In Mozambique, reefs affected by bleaching were exposed to increased sediment loading from February-May 2001 from floods in southern Mozambique. In the Xai-Xai lagoon, remaining coral cover decreased from 20 and 5% to 10 and 0.5% respectively for hard and soft with minimal recovery by December 2001. This effect rivaled the impact of the El Niño at this latitude, and reversed recovery on reefs affected by the El Niño. Floods in 2007 and 2008 will like add to this problem (see Chapter 7, Section 7.9.7.3, Zambezi River Floodplains, Cahora Bassa and Kariba Dams, Zambezi Delta, Mozambique).

Goreau (2005) states,

“the fungus is probably an opportunistic infection rather than a causative parasite. I think this disease, which is still poorly understood microbiologically, is now world wide in extent, and there are few places now that I don’t see it”.

Wilkinson (2002) estimates that coral reef impacts in the Xai-Xai lagoon as a result of flooding were respectively declines of 60% and 95% of hard and soft coral that made up 19% and 5% reef cover prior to flooding with minimal

recovery in 2001. More detail is provided in various reports contained in Linden, *et al.* (2002).

“The UNEP Eastern African Coastal and Marine Environment Resources Database and Atlas Project is producing a GIS covering East Africa and western Indian Ocean Islands. Several marine reserves were designated in Tanzania, but exist on paper only, and a recent addition off Zanzibar (gazetted in December 1994) is under private management. Two reserves exist in Mozambique (Bazaruto National Park and Inhaca Island Marine Reserve). Several areas have been designated around Mahé, the Seychelles and adjacent islands. Aldabra (the Seychelles) is a World Heritage Site. A few areas have been recommended for protection around Mauritius. Reefs are also protected in the Flacq and Black River fishing reserves. Four coral reef marine parks and five marine reserves exist and are well managed in Kenyan waters, and have been useful in showing the decline of species in non-protected areas” (Jameson, *et al.*, 1995).

8.11.2 Coral Degradation, Western Indian Ocean

The Indian Ocean Islands Global International Waters Assessment (GIWA) (Payet, *et al.*, 2003) found pollution (both sewage and solid waste), followed by global change (e.g., global warming) to be the most significant concern for the Indian Ocean islands region comprising the island states of Comoros, Mauritius, Madagascar and the Seychelles situated in the western Indian Ocean (WIO) region. Tourism and fisheries are likely to be the most significant economic sectors in the next 20 years and their growth could be jeopardized by eutrophication from sewage associated with development, misuse of fertilizers, intensive animal husbandry, industrialization and coral bleaching die-off from global warming. Factors such as population growth and increased consumption, which can take years to redress, can be considered an absolute root cause. The root causes identified by the GIWA survey identified for solid waste pollution,

and which can also be applied to land-based pollution in general that must be addressed, are:

- Root cause 1: Lack of investment planning and priorities;
- Root cause 2: Lack of effective mechanisms, inadequate institutional structure, laws and capacity;
- Root cause 3: Lack of adequate facilities, services for collection and management of wastes; and
- Root cause 4: Lack of education and awareness.

Coral reefs in the southwestern Indian Ocean islands are severely stressed as a result of human activities, compounded by the recent effects of the 1998 Indian Ocean bleaching event. A recent global survey (Bryant *et al.*, 1998), indicates that at least 25% of the coral reefs in the region were at high risk of degradation from human activities (mainly within the Comoros area), 28% at medium risk (mainly within the Madagascar and Mauritius areas) and 47% at low risk (mainly within the Seychelles area) (Also, see Table 8.3).

Goreau (2005) states that “these ‘risk’ estimates are based on arm waving about stresses, not on real measurements. Most of the corals in this region were killed by global warming in 1998, so these low ‘risk’ sites are nonsense”.

8.12 SUMMARY - PERSONAL OBSERVATIONS OF CORAL REEF DEGRADATION IN AFRICA

The following are observations the principal author made during his official duty for USAID as its regional environmental advisor for East and Southern Africa and on other occasions as his work led him along Africa’s coastal areas over the past 15 years.

It should be noted that land-based pollution and within this category improperly treated sewage is a major issue where large populations inhabit coastal areas. This will be a growing problem as these areas are developed for tourism and as people flee over-populated rural areas.

8.12.1 Land-Based Pollution and Coral Reef Degradation Mahé, the Seychelles

Observations were made of the heavy cover of *Sargassum spp.* algae smothering the nearshore fringing corals of Mahé, the Seychelles (Table 8.12), and epiphytic algae beginning to fill in spaces between the horny projections of the *Acropora/Porites* corals at the two sites on St Anne Marine National Park, an island a couple of kilometers off Mahé, the Seychelles. This could be indicative of nutrient pollution associated with improperly treated and disposed waste between Victoria (capital of Mahé) and the airport on Mahé. For instance, from the permanent resident population of Victoria alone (23,000 people), it can be estimated that this is equivalent to fertilizing the nearshore coastal waters with 17,300 – 17,700 kg (38-39,000 fifty pound bags) of 20/10/10 (NPK)/year fertilizer as a result of human waste disposal. If all of these nutrients are available for algae production, depending on the limiting nutrient, between 3.6 and 6.4 million kg (8-14 million pounds) dry weight of algae could be produced per year in Victoria's nearshore coastal waters. Looked at in this light, it is no wonder that epiphytic algae could out-compete and over-grow corals that have evolved to rapidly recycle nutrients in nutrient poor tropical waters. The importance of monitoring for nutrient pollution cannot be overstated. If siltation is the major cause of degradation, there is no quantitative data to determine what has been more devastating, sediment from dredging activities or sediment from land runoff during heavy storms (DeGeorges, 1990b).

Table 8.12: Underwater survey observation, Mahé and St Anne marine park, the Seychelles

SITE	OBSERVATIONS
<u>Baie Tourney National Park</u> , near lighthouse at mouth, Site 1 as example of minimally impacted reef	Large granite boulders dominated by different species of <i>Acropora spp.</i> 100% live coral cover, excellent diversity of fish, maximum depth 15 m (50 feet), 15 minutes, visibility 30.5 m (100 feet)
<u>Baie Tourney National Park</u> , 1 km off of National Youth Service camp, Site 2 as example of minimally impacted reef	Coral Reef showing minimal signs of stress with 20-30% dead coral, most likely caused due to pollution coming from NYS camp that has been in existence for about ten years, 3.7 m (12 feet) depth, 20 minutes, water quality data needed to better understand cause of reef degradation, visibility 15-30.5 m (50-100 feet)
<u>Auberge Club De Seychelles</u> 100 meters off shore, Site 3 as example of minimally impacted reef	Coral reef in excellent condition, 5% dead coral, minimal negative impact from hotel, perennial river in populated watershed, maximum depth 5.5 m (18 feet), 15 minutes, visibility 15-30.5 m (50-100 feet)
<u>One kilometer offshore from Victoria Sewage Treatment Plant</u> , in vicinity of outfall, Site 4 as example of highly degraded coral reefs from which fill material will be collected	95% of coral on fringing reef dead covered in <i>Sargassum spp.</i> , remaining dominant coral "boulder like", appears to be species of <i>Porites spp.</i> , minimal sedimentation observed on coral although visibility only about 3 feet, water column full of colloidal material and suspended solids, water quality data needed to better understand, maximum depth 2.4 m (8 feet), 15 minutes

Source: DeGeorges (1990b)

Table 8.12 (Cont.): Underwater survey observation, Mahé and St Anne marine park, the Seychelles

SITE	OBSERVATIONS
<u>Brilliant Point</u> , off lagoon outlet, just off of and before Runway Lights, Site 5 as example of highly degraded coral reefs from which fill material will be collected	40% <i>Sargassum spp.</i> cover, 40% silt covered dead coral and 10-15% live coral, dominated by same coral species as off sewage plant, visibility same as off sewage treatment plant, maximum depth 3 m (10 feet), 15 minutes
<u>Ile Cachée</u> , Site 6 as example of coral reefs that may have been impacted from dredging activities <u>(St. Anne National Marine Park)</u>	70% live coral, 30% dead coral. <i>Acropora spp.</i> corals dominant, most of dead coral on top of reef where <i>Turbinaria spp.</i> algae begin to dominate and percent dead coral increases, most of reef slopes living, while coral appears mostly alive, beginning to see epiphytic algae growing in interstitial areas, this could be the beginning of reef degeneration, reef needs monitoring both biologically and water quality, fish life excellent, visibility 15-30.5 m (50-100 feet)
<u>Ile Moyenne, St. Anne Channel</u> Site 7 as example of coral reefs that may have been impacted from dredging activities <u>(St. Anne National Marine Park)</u>	Exact conditions difficult to generalize, slopes, dropping off to a sandy bottom at about 12.2 m (40 feet) of depth, are made up of coral talus, at shallower depths 3-4.6 m (10-15 feet) and shallower area dominated by coral, <i>Acropora spp.</i> , while coral appears mostly alive, beginning to see epiphytic algae growing in interstitial areas, this could be the beginning of reef degeneration, reef needs monitoring both biologically and water quality, shallows (5 feet depth and less) dominated by extensive beds of <i>Turbinaria spp.</i> , algae, fish life excellent, visibility 15-30.5 m (50-100 feet)

Source: DeGeorges (1990b)

The above observations are speculative and a water quality and reef-monitoring program were recommended. Goreau (2005) states,

“the Porites and Sargassum remain in front of Victoria. Almost all the corals at Baie Ternay died in 1998, and the Marine Park Authority had to close the snorkel trail near Moyenne and Ronde because almost all the corals died. I found severe coral mortality in

the Amirantes too, despite lack of local anthropogenic stress, except at a few points where there was localized upwelling of cold water. Most of the corals on the remote Saya de Malha Banks died, even though they are very far from any stress, and we are the only people to have dived on them before and after bleaching”.

This implies that many corals died from bleaching associated with global warming.

It was expected that many of the 114 outer islands in the Seychelles contain virgin coral reef habitat. Not only because of their importance with regard to biological diversity, but because of their importance to island ecology, fishing and tourism, the Seychelles has the unique opportunity to protect its reefs based on its philosophy of sustainable development. These observations are supported by Ahamada, *et al.* (2002 *In:* Wilkinson, 2002) who state that on the islands of Comoros, Madagascar, Mauritius, Reunion and the Seychelles, reefs near large landmasses show obvious signs of degradation, whereas many of the isolated reefs remain in good condition.

However, by 2004, Ahamada, *et al.* (2004 *In:* Wilkinson, 2004) also found on the “inner islands” of the Seychelles that

“there was an average of 10.2% live hard coral cover on the 48 reef sites surveyed in early 2004. This shows moderate levels of recovery (from coral bleaching in 1998) from only 3% mean coral cover in November 2000 at 22 sites. The coral recovery has been steady, with statistically significant increases every year since 2000”.

On the “southern atolls” of the Seychelles in

“May 2003, live coral cover around Aldabra Atoll ranged from 3% to 58% in shallow water, with the very low values shallower than 10 m depth. Below 10 m depth, cover improved, though

Acroporids were low at all depths. Cover varied from 0.4% to 52% in deeper water, with total coral cover (soft and hard corals combined) increasing substantially over 4 years at 4 shallow-water sites and 2 deep-water sites. The increase in mean of total live coral cover at all sites between November 1999 and May 2003 was 11.7% in shallow water, and 4.9% in deep water; giving an annual increase of 3.3% and 1.4% respectively. The hard coral component in shallow water was 0.3%, but in deep water there was a decrease of 1.4%...The changes in coral cover were dominated by soft corals, especially the genus *Rhytisma* which forms an encrusting mat 2 - 4 mm thick. Dead coral cover and algal cover have barely changed, except that there has been a considerable increase in coralline algae, especially in shallow water" (Ahamada, *et al.*, 2004 *In:* Wilkinson, 2004).

Based on what was happening to the world's tropical coastal zones, the principal author believed back in the early 1990s that these islands (other than the over-developed Mahé) may be some of the few areas left in the world where healthy stands of coral reef exist over such a large area. The 1998 bleaching event may have changed much of this.

It should be noted that the identification of Indian Ocean corals is very difficult due to polymorphism. That is to say that under different environmental conditions, the same species of coral can take on a number of different forms. Through a combination of underwater photography of live coral and bleached samples of the photographed coral, a reference collection can be established to aid in the development of a monitoring program (DeGeorges, 1990b). Goreau (2005) also believes many *Acropora spp.* may actually be hybrids, making them difficult to classify. "In the Indo-Pacific where hundreds of *Acropora spp.* may spawn simultaneously, the chances of hybrids are vastly greater, and this may well account for the confusion over their taxonomy" (Goreau, 2005). This hybridization process in corals is described by Vollmer and Palumbi (2002).

Ahamada, *et al.* (2002 *In:* Wilkinson, 2002) identify deforestation and poor agricultural practices causing major soil erosion as an issue around Victoria and St. Anne Marine Park (20,000 visitors/year). The Seychelles, along with Mauritius, now require adequate treatment of solid wastes and sewage, Reunion being the only island in the region with sewage treatment facilities. While Victoria, Mahé, has a sewage treatment plant, DeGeorges (1990b) notes that treatment was inadequate to significantly remove nutrients. According to Ahamada, *et al.* (2002 *In:* Wilkinson, 2002), a new treatment plant became operational in 2001, though nothing is indicated as to the level of treatment or placement of the outfall.

8.12.2 Other Personal Observations on the State of Coral Reefs Off Africa

The following summarizes observations made by the principal author off the coast of Africa as to the state of coral reefs (Table 8.13).

Ahamada, *et al.* (2002 *In:* Wilkinson, 2002) state that coral reefs along the tourist coast of Mauritius continue to be degraded by sediment and nutrients from agricultural runoff. Sugar cane occupies 45% of the land in Mauritius (U.S. Library of Congress, 2003) and, as in the Caribbean, runoff from these lands pollutes the sea with fertilizers, pesticides and sediment. In addition, gray and wash water from the 700,000 annual tourists plus the 1.2 million local population, making this one of the most densely populated countries in the region (Ahamada, *et al.*, 2004 *In:* Wilkinson, 2004), is likely having a major impact on nearshore water quality.

Table 8.13: Other personal observations of principal author off African coast

SITE	OBSERVATIONS
Dakar, Senegal, 1977-1998	Shallows rocky shoreline as opposed to hermatypic (colonial) corals (no colonial corals!), from about 12-31 meters (40-100 feet) ahermatypic (non-colonial corals) yellow gorgonian finger corals, fish life rich, nutrient rich from upwelling and raw sewage from Dakar – many places are unsafe to swim
Old Town, Zanzibar 1990	In general coral reef and fish life appear healthy – about 1 km offshore fringing island, some reef near port and new tourism hotels beginning to show signs of algal cover
Kalifi, Kenya, 1991	Coral reefs below sisal plant discharge dead and smothered with sediment from plant effluent, a few kilometers further up coast with low density tourism homes – corals healthy, though at low tide, local fishermen walk on shallower coral reef to catch fish
Ras Mohammed National Park, Red Sea Egypt, December 1991	Corals healthy, no development allowed in park
Sharmel Shiek, Red Sea, Egypt, December 1991	Watershed completely built out with tourism facilities, daily Lufthansa flight, corals mostly dead with high algal cover – indicating likelihood of heavy nutrient pollution
Blue Hole, Dahab, Israel, December 1991	In middle of desert, coral health excellent, volcanic funnel, with exit hole at 56 m (185 feet) depth, plaques of people who died missing tunnel
Diego Suarez, Madagascar, Off Military Base 1991	Excellent coral health – only able to snorkel nearshore
Source: Principal Author	

Table 8.13 (Cont.): Other personal observations of principal author off African coast

SITE	OBSERVATIONS
Ile De Maurice (Mauritius) Grand Baie Aquarium October 21, 1990 NW/N Coast	The coral reef was highly degraded, mostly algal covered and dead (95-98%); it must be one of the better reefs since the dive operator wanted to make it into a marine park. Mauritius is built out with hotels and is covered in sugar cane and some tea. There is also industry. It is supposed to have one of the highest rates of pesticide application/km ² anywhere in the world. Also, according to the dive operator, there is lots of runoff during the rainy season. This reminds me of what I have been seeing in the Caribbean, likelihood of heavy nutrient, sedimentation and pesticide pollution.
Big T and Fern Reefs, 45 minutes up coast from Dar es Salaam, Tanzania, off Sea Breeze Hotel, December 1997. 5 Dives	Coral healthy, best coral 17-meter depth, high fish diversity
Pemba, Mozambique, March/April and Dec.1998, four dives off Nautilus Hotel	Pemba has a human population of 88,000 with no sewage. People defecate on the beach as they did all along the coast of Cabo Delgado Province, high algal cover in shallows and on wall, entire reef dived appears nutrient stressed as would be expected, on April 4 th dive observe lots of dead and bleached corals in shallows, also problems of local fishermen dragging nets in shallows, further up coast as near Tanzania border dynamiting said to be a problem.
Baixo Danae (Shallow Place) 1990, 50 km (31 mi.) off of Maputo and 10 km (6.2 mi.) N/NW off Inhaca Island, 1990 with South Africans (Dr. Kruger and Bush Terre Blanche of the South African Embassy).	Fish life excellent, reef beginning at about 7.6-9.1 m (25-30 feet) in depth. Looks physically damaged possibly from either dynamiting or trawlers dragging nets with about 40% live coral.
Inhaca Island, off Maputo, Mozambique, 1990	Visibility low, high algal cover on reefs – signs of pollution from capital city
Source: Principal Author	

8.13 THE FAILURE OF MARINE PARKS IN THE CARIBBEAN TO ADDRESS BIODIVERSITY ISSUES AND THE REAL CAUSES OF CORAL REEF DEGRADATION – LESSONS FOR AFRICA

While he was working as an environmental advisor for the Caribbean, the principal author had the opportunity to visit, dive and photographically record the following marine parks/reserves (marine protected areas/MPAs):

- Holchan Marine Park, Ambergris Bay, Belize, started by Wildlife Conservation Society (WCS);
- Lighthouse Reef/Blue Hole, Belize;
- Les Arcadins, Haiti, WWF;
- Montego Bay, Jamaica, The Nature Conservancy (TNC); and
- Anse Chastinet/Pitons, St. Lucia

The flaw behind all of these marine parks is:

- They took a simplistic approach, declared an area a park, put buoys around it, declared it off limits to local fishermen; and
- All of these marine parks, except Anse Chastinet, were in watersheds with land-based pollution problems (Table 8.6), even Lighthouse Reef/Blue Hole many miles offshore. On Lighthouse Reef/Blue Hole, pollution is believed to have been caused by, among others, a phosphate fertilizer ship that had run aground and from which the fertilizer was never removed, plus possible major changes in land use from Honduras to Belize (unfortunately, no water quality data available to verify) (see Section 8.5.1, Belize and Land-Based Pollution, Lessons for Africa).

When the principal author dived what is now Holchan Marine Park in 1973/74, Ambergris Cay was a sleepy fishing village of lobster divers. When he came back in 1988/89, the island was build out with fancy hotels and the mangrove and grass bed areas on the landward side of the island were being heavily dredged and filled for additional hotels and marinas.²¹³ An ecological disaster was underway. Excitedly, he went out to dive what had been virgin pristine coral reef in the mid-1970s only to find most of the barrier reef dead. The sport divers with whom he dived had no reference point. To them, fish swimming around dead coral was “beautiful”. The case of Montego Bay Marine Park is discussed above (Section 8.6.2., Montego Bay, Marine Park or Cemetery? A Lesson for Africa). Anse Chastinet/Pitons was the one underwater park that was pristine, largely because the entire watershed was a protected rainforest with minimal human inhabitants. It can only be hoped that this is still the case today. The principal author would never consider taking a vacation to dive on these “dead reefs”. About 20 years have gone by since the principal author dived these areas. He can only assume that environmental conditions have worsened.

The UNEP-WCMC World Atlas of Coral Reefs (Spalding, *et al.*, 2001) further supports the principal author’s concern. The atlas maps the 660 marine protected areas worldwide that incorporate coral reefs. It notes that, unfortunately, many of the protected areas exist on paper only, that they are poorly managed and have little or no support or enforcement. It says they often only focus on controlling the direct impacts of humans on coral reefs, ignoring the more remote sources of threats to reefs, notably pollution and sedimentation from the adjacent land. “Often remote from reefs, deforestation, urban development and intensive agriculture are now producing vast quantities of sediments and pollutants which are pouring into the sea and rapidly degrading coral reefs in close proximity to

²¹³ Estimated equivalent of 6,500 fifty pound sacks of 20/10/10 (N/P/K) fertilizer produced by tourists and residents from sewage dumped into nearshore waters of Ambergris Cay and Cay Caulker (DeGeorges, 1989b; 1990a).

many shores" (Spalding, *et al.*, 2001). Wilkinson (2004) notes that only 6% of 285 MPAs in the Caribbean are effectively managed. On the positive side, "no-take MPAs", that is protection zones where no harvest of resources are permitted, seem to help serve as a core to allow fish proliferation that feeds into buffer areas that are fished (Wilkinson, 2004) similar to parks in Africa that feed peripheral hunting blocks.

8.14 THE NEED TO WORK WITH FISHER COMMUNITIES TO MANAGE THEIR COASTAL ZONES

Too often fishermen are blamed for the demise of the world's coral reefs, when they are victims rather than culprits (see Section 8.3.3, Caribbean Fishermen Victims Or Culprit – Lessons For Africa). Where over-fishing is a problem, fishes are renewable resources and, if properly managed, can recover and provide a sustainable livelihood and source of food for populations. Implementation of the FAO Code of Conduct for Responsible Fishing by all states is a key step. Several management approaches, especially in combination, have shown promise (U.S. Dept. of State, 1998f):

- Institution and enforcement of bans on destructive fishing techniques [e.g., blast fishing, *muro ami* (destructive drive-in cone-shaped net with wings where divers scare/push reef fish into net) and cyanide fishing] and certain gear types (e.g., certain types of gill nets or mesh sizes) are a necessary first step and can be combined with traditional management practices such as seasonal closures or size and take limits;
- Community-based tenure and management of nearshore coral-reef fishery resources can give fishing communities incentives for long-term sustainable use;

- Development of "no-take" fishery reserves has shown particular promise in the Caribbean (e.g., Belize and the Bahamas) and the Indo-Pacific (e.g., Australia and the Philippines). Small-scale efforts can protect reef fishes and their habitat, making them more attractive to tourists and providing spillover benefits to surrounding fisheries. Larger protected areas can provide sources of larvae for whole regions. The U.S. just announced development of its first "no-take" coral reef fishery reserve in the U.S. Virgin Islands; and
- Linking protected areas and fishery reserves on a regional basis is necessary, since the fishery resources of most countries depend on larval recruitment from distant parent populations, often in other countries. The Caribbean offers a particularly important opportunity for implementing this approach.

For any of this to work, local communities, especially fishers, must be a key component of a bottom-up decision-making process undertaken to assure the viability of artisanal reef fisheries, unlike the process leading to the creation of the Montego Bay Marine Park, which initially excluded fishermen from decision-making. It appears the local fishermen revolted against this declaration and marched on the marine park headquarters, soon after the park was declared. Currently, only a small portion of the park, the Bogue Lagoon (a fish sanctuary) is off limits, with no spear fishing being the only gear restriction for the remainder of the park. Enforcement is lax and management limited, both due to a lack of manpower (*Zane, pers. comm.*).

Thus, it must be asked, who is the culprit and who is the victim? Is it the fishermen who are the primary cause of the problem, or inappropriate land-based development, resulting in pollution that destroys the fishing habitat that has supported communities for 100s of years? Yes, the fisherman is part of the

problem, but more often, he is a victim rather than a culprit. As human populations grow, just like on land, pressures on the fishery resources are increasing, and fishermen need to go from extensive into intensive management systems. Consideration should be given to dividing the East Africa Coast into management zones controlled by fisher communities. Youth from these communities need to be sent off for additional education in fishery and marine management. However, to kick fishermen off traditional areas so that hotel and dive operators can benefit to their exclusion or to create marine parks, comparable to game reserves on land, that result in the impoverishment, malnourishment and ultimately alienation of local people is both conservation folly, as it is doomed to fail in the long-term and is a violation of basic human rights, something which society should not tolerate.

Wilkinson (2004) explains that similar to what happened and is happening all over Sub-Saharan Africa in the creation of “Open Access Resources” (see Chapter 3, Section 3.4.1, Centralized Control of Natural Resources and The Arrival of Conservation),

“A contributing factor has (been) the replacement of traditional resource management, with ‘Western’ or ‘modern’ methods of governance. The traditional management approach was consensus based or ‘integrated coastal management’, often with the whole community involved in prior discussions before decisions were made that could affect the natural resources of the community; the resources were the property of the community. The Western model introduced a cash economy, the concept of free access to all marine areas, and a sectoral government approach, with a fisheries department to maximize fish harvest, a forestry department to maximize returns from trees, and the environment department tasked with conserving both resources and the whole ecosystem, but provided with few resources and staff”.

Given the victimization of coastal fisher communities globally the International Civil Society Marine, Inland Fisheries and Coastal Commission Declaration to the World Summit on Sustainable Development (WSSD) at NASREC, Johannesburg, 29 August 2002 (Edited: 12 November 2002) calls on all government decision-makers and other participants involved in bilateral and multilateral fisheries and oceans negotiations to (WSSD, 2002):

- “Transform existing systems of unequal ownership, access to and use of marine and coastal resources into systems based on sustainable and equitable use and access rights;
- Eradicate poverty and ensure food security for coastal communities through equitable and sustainable community based natural resource use and management;
- Guarantee the access rights of traditional subsistence and artisanal fishers to marine and inland fisheries resources, and provide local fisheries-dependent communities priority rights to the resources on which they depend for their livelihoods;
- Recognize the value of indigenous and local knowledge, culture and experience in resource management and facilitate the empowered participation of local communities in the use, management and protection of aquatic resources;
- Strongly support policies and mechanisms that promote an integrated, sustainable livelihoods approach to coastal and aquatic resources management by developing alternative livelihoods and adding value to certain resources, thereby relieving pressure on other scarce aquatic resources;
- Improve scientific research and environmental education for all aquatic ecosystems;
- Facilitate the engagement of local communities in the implementation of integrated coastal zone management procedures, with particular support for Developing States;
- Grant the communities that depend on fish resources for their livelihood both in the marine and inland sector common property rights over the resources.
- Provide support to artisanal and small-scale fish workers, taking into account the social, economic and environmental importance of this sector;
- Ensure priority rights of the artisanal and subsistence fishers to the coastal and inland areas where they live and

- the aquatic and inland resources to which they have customarily enjoyed access for their livelihoods;
- Adopt appropriate legal and policy measures to protect access and use rights of women fish workers to coastal and marine resources;
- Seek a rational and equitable balance between social and economic objectives in the exploitation of the living aquatic resources accessible to traditional, artisanal and subsistence fishers by taking particular account of the needs of politically, socially and economically disadvantaged fishers; and
- Evolve, on a priority basis, necessary mechanisms for the release and repatriation of small-scale fisher people arrested for transborder movement into waters of neighboring states, taking into account the fact that such movement is often the result of poor fisheries management and depletion of local coastal resources”.

The fact is that most of these recommendations just as easily fit for traditional resource users on land such as traditional hunters, pit sawyers, charcoal makers, pastoralists, honey collectors, etc. Wilkinson (2002) mentions, discussed in some detail in Chapter 9, that governments reluctantly devolve authority of the management of natural resources to lower authorities. In the Philippines, a model has evolved in which the local authorities (*barangays*) have been encouraged to manage their own coastal resources. This model is spreading to Indonesia. Wilkinson (2002) recommends that communities:

- Be given the necessary information in culturally and linguistically appropriate ways;
- Be involved in all stages of resource management, especially in initial assessment and mapping to determine the extent and status of resources;
- Trained in coral reef and fishery monitoring;
- Helped with alternative livelihoods to avoid the destructive exploitation of reefs;
- Target community and religious leaders to head up the process;
- Be prepared to take on responsibilities of devolution and governments to devolve; and
- Use successful projects as demonstration to neighboring communities to join in.

Wilkinson (2004) recommends that

“co-management of resources by local communities should be encouraged to prevent collapse in fish stocks and improve enforcement; and management needs to be adaptable to local conditions, traditional management techniques, and fishing cultures to ensure a more effective self-enforcement of regulations”.

The fact is, regardless of where one goes in the world, without local support, no resource is manageable. This is especially true in developing countries, where most coral reefs are found, and where the majority of the people have their livelihoods directly tied to living off the resources. Integrating them into the decision-making and active management/monitoring of the coral reefs and their resources has a much better chance of succeeding than trying to establish prohibitions (no take MPAs), unless there is a buy-in from the community and in the long-term they agree that it is in their interest.

Below are a few initiatives beginning off the East Coast of Africa in Tanzania. Similar attempts are being made in South Africa such as along the coast of Natal, South Africa (Funston, *pers. comm.*) (Chapter 9, Section 9.6.3.8, CBNRM, subsistence fishery, Lake St Lucia, KwaZulu Natal, South Africa).

8.14.1 Community Coastal Zone Management, Tanzania

“The Tanga Coastal Zone Conservation and Development Program, in partnership with the Wildlife Division of the Ministry of Natural Resources and Tourism (MNRT) and with IUCN support, have established collaborative management agreements for coastal fisheries and mangrove forests. The two major objectives of this program are to improve the capacity of government to undertake integrated coastal zone management, and to assist communities in using coastal resources in sustainable ways, including the restoration of degraded environments

(Makoloweka, Gorman, Horrill, Kalombo, Kawau, Lugazo, Shurcliff, Uronu & van Ingen. 1996; 1997 both *In:* Barrow, Gichohi & Enfield, 2000). Priority environmental issues have been identified and include declining fish catches, destructive fishing techniques, mangrove cutting and coastal erosion. The project's approach has been one of initial 'listening and testing', followed by training and learning through doing (Makoloweka, *et al.*, 1996 *In:* Barrow, *et al.*, 2000). This is summarized in the approach of 'listening, piloting, demonstrating and then mainstreaming' (Van Ingen & Makoloweka, 1998 *In:* Barrow, *et al.*, 2000). Village initiatives have included new bylaws, mangrove and tree planting, reef zoning and closures, and form the basis for collaborative fishery and mangrove management agreements" (Barrow, *et al.*, 2000).

Village environmental committees developed six collaborative management plans along the entire coastline. The health of these reefs has improved based on the following factors (Wilkinson, 2002):

- Fish populations are larger;
- Catch rates are up; and
- Destructive fishing practices (e.g., dynamite fishing and beach seining) have declined due to collaborative enforcement between villagers, district officers and the navy.

No take areas have been established to serve as a core to feed fish into the surrounding areas. Village monitoring teams, in collaboration with district officers and the IUCN, survey and then open/close areas depending on coral cover and the abundance of target fish and invertebrates.

"The passing of the Marine Parks and Reserves Act in 1994 allowed marine parks to be gazetted in a manner that actively involved and integrated customary users into the park management and enabled sustainable use of resources. Using this act as a basis, a general management plan for Mafia Island Marine Park was developed to attempt to integrate the needs of the rural people with

those of conservation (Andrews 1996; 1997 *In: Barrow, et al.*, 2000). However, despite strong policy support for full community participation, the responsible institutions are still reluctant to change (Andrews 1996; 1997 *In: Barrow, et al.*, 2000) (Barrow, *et al.*, 2000).

The Misali Island Conservation Area of Pemba, Tanzania is the basis for an innovative approach to community fishery and coastal resource management (Cooke & Hamid, 1998 *In: Barrow, et al.*, 2000). The fisher community is highly diverse, comprising 1,640 fisherpersons from 29 coastal wards or Shehias (Cooke & Hamid, 1998 *In: Barrow, et al.*, 2000). The basic approach has been to consult the community fully and to involve them directly in formulating objectives and work plans, and to evolve a sustainable mechanism for community participation in the long-term management of Misali. This led to the development of a committee system as the principal means of decision-making by the community, and legislation with an outlined management plan to legitimize this system and working resolutions. Legislation developed by the project aims to ensure that the community has an effective collaborative role in management through the granting of powers for management to a management committee, which is dominated by community representatives. In order for this to work more efficiently it is proposed to create the Misali Island Conservation Association as an NGO which can solicit for funds and project activities. The community response to date appears to have been very good, with the lesson that full community participation must be the basis for any successful local protected area in such places (Cooke & Hamid, 1998 *In: Barrow, et al.*, 2000) (Barrow, *et al.*, 2000)”.

8.15 KEY ACTIONS TO MITIGATE THREATS TO CORAL REEFS

The following table (Table 8.14) summarizes the relative importance (H = high, M = medium, L = low) of the objectives under each goal outlined in the Strategy and National Action Plan to address key threats to international coral reef ecosystems by region.

Table 8.14: Key actions to coral reef protection

ACTION	Wider Caribbean	East Asia	Pacific	East Africa / Indian Ocean	Middle East
Map shallow reefs (<30 m)	M	L	L	L	M
Map deep reefs (>30 m)	L	L	L	L	L
Conduct rapid assessments and inventories	L	L	M	M	L
Monitor coral, fish and other living resources	H	H	H	H	H
Assess water and substrate quality	M	M	L	L	M
Assess global warming and bleaching	H	H	H	H	H
Understand reef processes	M	L	M	L	H
Understand reef diseases and bleaching	H	L	L	M	L
Understand impacts and management solutions	M	L	M	M	M
Assess human uses of reefs	H	M	M	M	M
Assess social and economic impacts of reef management	M	M	M	M	M
Assess the value of reefs	M	M	M	M	L
Strengthen existing marine protected areas (MPAs)	H	H	H	H	H
Identify gaps in MPA system	M	M	M	M	M
Establish new MPAs	H	H	M	M	M
Reduce over-fishing	H	H	H	H	H
Reduce habitat destruction and other indirect impacts	M	H	M	H (e.g., Dynamiting off Tanzania & border of northern Mozambique)	M

H = High priority action needed to address threats, M = Medium priority action to address threats, L = Low priority action to address threats

Source: Evans (2002) with permission, National Oceanic & Atmospheric Administration (NOAA), U.S. Department of Commerce + U.S. Government public domain.

Table 8.14 (Cont.): Key actions to coral reef protection

ACTION	Wider Caribbean	East Asia	Pacific	East Africa / Indian Ocean	Middle East
Reduce dredging and other habitat impacts	L	L	M	H	L
Reduce impacts from ocean recreation	M	L	L	L	M
Reduce impacts from ocean recreation	M	L	L	L	M
Improve vessel management	M	L	L	L	H
Increase coastal management/ land planning and zoning	H	H	H	H	H
Reduce sediment pollution	H	H	H	H	H
Reduce nutrient pollution	H	H	H	H	H
Reduce chemical pollution	M	M	L	L	H
Reduce marine debris	L	L	L	L	L
Prevent and control invasive species	L	L	M	L	L
Improve response capabilities	L	L	L	L	M
Improve restoration techniques	L	L	L	L	L
Restore damaged reefs	L	L	L	L	L
Increase education and outreach	H	H	M	H	M
Increase awareness					
Increase management capacity / support project development	H	H	H	H	H
Support international partnerships, institutions, conventions	H	H	H	H	H
H = High priority action needed to address threats, M = Medium priority action to address threats, L = Low priority action to address threats					
Source: Evans (2002) with permission, NOAA + U.S. Government public domain.					

Table 8.14 (Cont.): Key actions to coral reef protection

ACTION	Wider Caribbean	East Asia	Pacific	East Africa / Indian Ocean	Middle East
Reduce destructive fishing practices / over-fishing	H	H	H	H	M
Increase international awareness	M	H	H	M	M
Work with international conventions, regional organizations	H	H	H	M	M
Improve coordination	H	H	H	H	H
Improve coordination with partners					
H = High priority action needed to address threats, M = Medium priority action to address threats, L = Low priority action to address threats					
Source: Evans (2002) with permission, NOAA + U.S. Government public domain.					

Rankings were provided by official representatives to the International Working Group of the U.S. Coral Reef Task Force (CRTF). The U.S. Coral Reef Task Force was established by President William (Bill) Jefferson Clinton in June 1998 through Executive Order #13089 to lead U.S. efforts, both domestically and internationally, to protect, restore and sustainably use coral reef ecosystems. Chaired by the Secretary of the Interior and the Secretary of Commerce, the Task Force is composed of the heads of 11 federal agencies and the governors of seven states, territories or commonwealths with responsibilities for coral reefs. A higher ranking suggests that conducting the objective is considered more important to addressing current threats to coral reefs in the region. Lower rankings suggest that although implementing the objective may make significant contributions, it is currently less important to addressing the major threats to coral reefs in the

region. The actual importance of each objective in addressing threats to reefs will vary within and between regions depending on conditions, location and other factors (Evans, 2002).

It should be noted that today land-based pollution issues are noted as high priorities across the globe, regardless of the geographic region. In order to monitor the impacts of land-based pollution, the Caribbean Water and Wastewater Association (CWWA) has made water quality monitoring a priority, especially for the critical nutrient parameters (Sealy, 2002). While Table 8.14 places nutrient and sediment pollution as high priorities globally, water quality monitoring is given a medium to low priority, which appears contradictory since nutrients and sediment water quality along with percentage live/dead coral reef and epiphytic algal cover should be monitored at permanent long-term sampling sites on key reefs, especially in developed watersheds. Wilkinson (2004) goes into some detail on various monitoring efforts globally. Goreau (2005) believes that too much emphasis is put on monitoring when we know many of the reefs are degraded, as opposed to developing action oriented programs to work with local people in dealing with sewage, re-growing their reef and reef fish management.

8.15.1 Training and Capacity Building

“Most coral reef countries lack trained personnel for coral reef management, awareness raising, enforcement and monitoring. Moreover they lack the necessary resources to implement effective management. Thus, there is a need to:

- Assist in the training of environmental resource managers and ensuring that they are provided with in-country employment;
- Assist countries in the development of alternative livelihoods to combat poverty and the need to over-exploit coral reef resources (see Chapter 9, Section 9.7.8.3, Need for non-rural livelihood alternatives through industrialization);
- Assist developing countries to design, implement and manage networks of MPAs to conserve their resources;

- Consolidate the training provided by UN agencies and MEAs (Multilateral Environmental Agreements) to ensure that they are targeted on resources, issues and problems relevant to conserving national resources;
- Provide adequate and long-term financial and logistic resources for developing countries to undertake environmental planning for the longer-term, rather than the 3-5 year funding cycle of projects (see Chapter 11, Section 11.7.2, Foreign Aid Conditionalities Good Business for Donor Country not Recipient/Host Country);
- Assist in the recognition of appropriate traditional knowledge and methods of environmental management and help governments harmonize these with state and national laws; and
- Develop the ‘capacity to build capacity’ and use train-the-trainers and peer-to-peer exchanges as low cost (Wilkinson, 2004)”.

Many of these same issues are discussed in some detail in Chapter 9. As much emphasis needs to be placed on training and educating individuals from the communities (Chapter 9, Section 9.7.5, Lack of Technical and Management Skills) as government bureaucrats. Youth trained at the university level can return and work with their communities to both sustainably manage and valorize their resources

8.15.2 An Innovative Attempt to Bring Back Corals – 3rd Generation Artificial Reefs

The principal author undertook his master’s thesis on artificial reefs from tires. In the past old vehicles, train cars, cement rubble from building demolition, felled trees, etc. were used in coastal zones and reservoirs, especially on bottoms of sand and mud, as a means of artificially enhancing fish habitat. This was mainly for sport fishing. In recent years, Goreau (2004d) has developed a technology, which is trying to speed up coral recovery once the source of coral death (pollution, global warming, etc.) is eliminated and/or minimized. Goreau believes his method

grows corals four times faster than normal, survives high temperatures, sediments and algae overgrowth 16 to 50 times better than surrounding corals, creating superior habitat with incredible numbers of fishes, as well as turning eroding beaches into growing ones. In the Maldives in 1998, only 1-5% of corals survived heatstroke caused by global warming, but in the same habitats, 50-80% of the corals on Biorock™ structures survived. One of his Indonesia projects covers about 0.5 km, and has 1,000s of corals of around 200 species. The Biorock™ Process or mineral accretion is a revolutionary technology developed by Prof. Wolf H. Hilbertz and coral ecologist, Dr. Thomas J. Goreau, of the Global Coral Reef Alliance, which grows structures and marine ecosystems in seawater (Global Coral Reef Alliance, 2004).

“Artificial reef construction by means of mineral accretion, also known as ‘third generation’ artificial reef systems (first reported in Asian Geographic in 2001), is a novel technology which uses electricity to ‘grow’ limestone rock on artificial reef frames and increase growth rates of corals and other reef organisms. Two electrodes supplied with low-voltage direct current are submerged in seawater. Electrolytic reactions at the cathode cause minerals naturally present in seawater to build up” (Sea Science, 2002).

“Biorock technology applies a safe low-voltage electrical current through seawater, causing dissolved minerals to precipitate onto cathodic surfaces growing into white limestone/brucite structures similar to those that make up coral reefs and nourish tropical white sand beaches. Biorock methods speed up coral growth even where excessive temperatures, pollution, sedimentation and other stress-inducing factors have damaged reefs and other marine habitats” (Global Coral Reef Alliance, 2004).

At the same time, a wide range of organisms on or near the growing substrate are affected by electrochemically-changed conditions, shifting their growth rates. Stray or loose living corals are carefully collected from nearby destroyed reefs

and transplanted²¹⁴ onto the structures. They are attached with wires or wedged between steel bars. These coral bits are quickly cemented into place by the growing minerals forming over the structure's surface; the reefs are electronically charged to grow (Coral Reef Alliance website, Sea Science).

Biorock technology provides a cost-effective and sustainable method to accelerate coral growth and increase coral survival particularly in areas where environmental stress has affected existing reefs.

“The Biorock™ process grows limestone rock that is predominantly made of the mineral aragonite, the same mineral that makes up the skeletons of coral and most coral reef rock and sand. Young corals prefer to settle on clean limestone surfaces, and settle on it when they will not settle on exotic materials such as steel, concrete made with hydraulic cement, plastics, or rubber tires. Juvenile corals settle on Biorock™ materials at high density. Corals growing on Biorock™ structures are healthier and have much more energy for resisting environmental stress, and so are able to survive stresses that kill neighboring corals. As environmental stresses from global climate change and increasing pollution increase, corals on mineral accretion structures are increasingly likely to be the only survivors....This makes them ‘Coral Arks’ for preserving species from extinction from global change, and for maintaining the ecosystem services” (Goreau, 2003b).

“Corals normally have to spend a large part of their metabolic energy reserves creating high pH conditions internally in order to grow their skeleton, but the Biorock® process provides these essential conditions for free, leaving the coral with much more

²¹⁴ Not using any of the above technology, Tamelander and Obura (2002 *In: Wilkinson, 2002*) found that natural coral recruits and surviving coral colonies fared better than transplants in terms of growth rates, survivorship as well as cumulative growth. This was likely due to the stress of cutting transplants making them vulnerable to predation and disease especially at the damaged edges of the transplanted fragments. Where background coral growth was poor, transplant growth was likely to be poor. This implies that 1) creating an artificial substrate to allow natural recruitment using the above technology might work better than transplants and 2) unless the source of degradation is removed (e.g., sewage, agricultural runoff) then transplants using the above technology or just placed in the area will likely not grow well.

energy for tissue growth, reproduction, and resisting environmental stress. Corals growing with the Biorock® process grow several times faster than normal. The specific growth enhancement depends on the species and the specific operating conditions. Typically these are such that the coral is growing 2-5 times faster than normal, but much higher rates, up to 10 times faster, have been reached. Staghorn corals, which normally grow 15 cm per year under good conditions, grew 10 cm in just 10 weeks. Finger corals in a highly polluted environment grew about 5 times faster than normal. Large head corals appear to grow around 2-5 times faster as well, but there are big differences between species” (Goreau, 2003b).

Of course, this can never hope to replace the beauty of a live vibrant coral reef – at least not in your lifetime or mine.

8.16 CONCLUSION

Coral reefs are threatened globally, primarily from land-based pollution and since 1998 from global warming.

Africa has many lessons to learn from the mistakes of more evolved regions of the world such as America, Australia, the Caribbean, Central America and the Indian Ocean islands where inappropriate tourism development has destroyed coral reefs that serve as a basis for all that attracts tourists in the first place: clear blue water, white sand beaches, seafood, SCUBA diving and sport fishing.

The east coast of Africa, where the majority of the continent’s colonial corals are found, is fortunate that most of its coastline, other than a few large cities, is relatively undeveloped, which is where the Caribbean and Florida Keys were back in the 1960s and early 1970s. There are many lessons to be learned from the Caribbean about how not to develop the coastlines and about appropriate technologies such as the treatment of brown and gray and water.

If you see degraded coral reef, unless there is dynamiting as off southern Tanzania and maybe northern Mozambique, turn around, walk up to the beach, spread your arms like a profit giving a sermon and gaze into the watershed where 90% or more of the problem can be identified. Improperly treated sewage, as a key component of land-based pollution, is believed to be one of the prime causes resulting in nutrient pollution, since often this sewage is literally dumped on top of coral reefs by coastal tourism facilities. Thus tourism, among other land-based activities, is destroying the very attractions that bring tourists to the world's coastal zones in the first place. Other causes of reef degradation include sedimentation from land-based poor soil conservation or improperly located agricultural activities and associated agro-chemicals, over-grazing and industrial pollution. While issues such as global warming that in 1998 resulted in a global mass die-off of coral reef and depletion of the ozone layer must be dealt with on an international level by such groups as the UN, WTO and UNEP, these issues must not replace taking on-the-ground actions to deal with land-based pollution.

Key coral reefs that are in need of protection can be identified along the East African Coast, where damage is already occurring , (e.g., Mafia Island, Bazaruto Complex off Mozambique). Developers and governments need to be sensitized that it costs just as much to invest in sustainable development (e.g., proper location of lodges behind primary dunes, appropriate sewage technology, etc.) as to do it wrong, resulting in a more secure investment in the long-term. One can work with hoteliers, dive operators, fishermen, small-scale farmers, woodcutters and pastoralists to better manage their resources and to decrease sedimentation, pollution and destructive practices that adversely impact the natural resources of the nearshore waters. These are things one can put one's finger on and do something about, much more so than regarding global warming and the ozone

layer. Moreover, if we wait for these “big picture” issues to be dealt with, by the time they are addressed, land-based pollution risks to have wiped out the reefs.

With the movement towards decentralization (*gestion des terroirs*), consideration should be given to empowering fisher communities along the coasts to manage segments of the coastline including the corals, grass beds and mangroves and their associated fisheries within the boundaries of these designated areas. This should include helping them to develop sustainable harvest programs for their fish. Youth from fishing communities need to be sent for tertiary training in fisheries/environmental and protected area management, as apprentices in running sport fishing and dive operations and eventually to run and operate their own tourism businesses as on Ambergris Cay in Belize (e.g., the sons of fishermen becoming dive operators, glass-bottom boat operators and sportfishing guides). Ultimately, fisher communities must be part of the solution integrated into as opposed to alienated from modern conservation concepts as they are applied to Sub-Saharan Africa’s coastal zones, especially East and Southern Africa where the majority of the coral reefs are found. To be successful in the long run, conservation of Africa’s coastal zones must first and foremost meet the needs of local residents and last and least those of international NGOs and tourists.

Meanwhile, and on the return from their studies, youth selected from these fisher communities can work with them to establish permanent reef monitoring, water quality and fishery statistics programs to assure sustainable development that conserves these unique, biologically diverse and economically important coral, mangrove and grass bed ecosystems.

If outside developers wish to come in and engage in joint venture with such communities, part of the cost of development should be following certain prescribed environmental guidelines that deal with issues such as sewage and gray

water disposal, the position of buildings and lights with regard to beaches and turtle nesting sites, rules to prevent minimal impacts on corals from SCUBA divers, boat anchors and rules regarding spear/sport fisherman. Monitoring and education of youth from local communities must be considered a recurring cost of doing business and should be part of the investment portfolio. Ultimately, one must ask if humankind wishes to see healthy colorful coral reef (Figures 8.1 & 8.6) or dead and dying reef (Figures 8.2, 8.3 & 8.5) that is becoming so common across the globe. The choice is ours!

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Chapter 9

9.0 COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT (CBNRM) PROGRAMS - THE WAY FORWARD FOR SUB-SAHARAN AFRICA?

“In old Africa, there were decision makers in the villages. Their decisions seemed to favor conservation. Now we try and influence national planners in the capital to achieve nature conservation. But the village decision maker still decides whether or not he will kill the last leopard in his stretch of the country. Something is out of balance. Can the balance be restored” (Dasman, 1976 *In:* Edwards, 1994)?

...“political, cultural and economic considerations may be more important than biological ones in cropping wildlife” (game cropping) (Blankenship, Parker & Qvortrup, 1990).

Marks (1984) best sums up the dilemma of modern conservation in Sub-Saharan Africa, the conflict between Western imposed conservation and African conservation, in his infamous book The Imperial Lion, described by one of the founders of CBNRM, Marshall Murphree (*pers. comm.*), in the early 1990s as “my bible”:

“...the management of wild animals abroad must be defined within the social as well as biological context...the metaphorical lion which Northern European wildlife managers have fostered, in the name of ecology (today in the name of biodiversity), of wildlife survival, and as a legacy for humanity, on the seemingly benign African landscape is an imperial lion...of assumed privilege, of unwarranted access to another society’s life-sustaining resources, and of interference in their liberty. Its genesis and sustenance comes from outside the continent on which it roams. The imperial lion is a frightful beast for it comes unexpectedly to destroy, and

its presence disturbs the community until people find the means by which to neutralize and dismiss it. Its natural enemy is the lion of African culture to which it has become increasingly vulnerable. This spiritual lion is rooted in traditions and realities...of identity, of self-respect, of autonomy. It is this lion's presence which wildlife managers must learn to cultivate and to enhance by increasing their understanding of the social consequences of human actions. Their failure to do so will help destroy what managers and conservationists value most on the African continent" (Marks, 1984).

"...much is now known about community based natural resources management and how it failed its promise to deliver both conservation and development..." (Dzingirai, 2004) in a report put out by IUCN-ROSA (Regional Office for Southern Africa).

"As Africans achieve greater political maturity, however, Bonner thought, they will no longer 'allow themselves to be dominated by Europe and the United States. 'They threw off colonialism once,' and Bonner now predicted that 'one day they will throw off eco-colonialism in the management of their wildlife and other aspects of the environment' " (Bonner, 1993 *In:* Nelson, 2003a).

About " 'one thing there can be no doubt, however: the old orthodoxy of conservation purely as a state-enforced protection, which evolved in the colonial era and was continued by the elites who took control of independent Africa in the 1950s and 1960s, is no longer presented as a viable option by any serious actors' " (Hulme & Murphree, 1999 *In:* Fabricius, Koch & Magome, 2001).

Living off donor handouts and often educated in the West and/or in Western conservation philosophy, the techno-bureaucratic elites tend to still represent developed world interests and norms, where wilderness is a valuable and affordable antidote to urban living (Child, B, 2004a). The voiceless rural masses are still seen as more of a nuisance to these elites and their private sector partners and the ongoing patronage system that dominates to the benefit of everyone but the rural poor, who must live from nature and co-habit with wildlife.

The first eight chapters of this book discuss traditional resource management and demonstrate how European colonialism poured over Africa, like water from a collapsed dam, in attempting to obliterate systems of traditional management and governance, while replacing them with European approaches and technologies, often inappropriately used to manage resources. Rather than mixing together into one, this clash of cultures has been like two liquids of distinct density, oil and water, refusing to blend together.

This chapter discusses a concept made popular in the mid-to late 1970s beginning with Zimbabwe's development of the Communal Areas' Management Program for Indigenous Resources (CAMPFIRE). Since administration and control through repression by centralized governments was not saving wildlife, the idea arose of sharing wealth from the sustainable use of resources with rural people. The idea was that community conservation would fulfill human needs, with conservation being the means to achieving and maintaining this end (Jones & Murphree, 2004 *In: Child, B., 2004a*). This chapter attempts to provide an overview of the practical experiences and evolution in thinking over what has become known as Community-Based Natural Resource Management (CBNRM). IUCN/SASUSG²¹⁵ (1997) provides a very clear definition of the concept of "sustainable use" on which CBNRM is based:

²¹⁵ International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU) and Southern Africa Sustainable Use Specialist Group (SASUSG) of IUCN/The World Conservation Union Regional Office for Southern Africa

USE – is the derivation of the benefit from a wild natural resource in one or more of the following respects:

- Economic or financial;
- Social or cultural;
- Political; and
- Ecological.

SUSTAINABLE USE – is use that allows for the continued derivation of benefit

As such, there are no valid distinctions between

- Consumptive and non-consumptive use;
- Commercial and subsistence use; and
- Conservation and sustainable use.

However, in much of Sub-Saharan Africa, “sustainable use” equates to consumptive use of natural resources based on sound biological, social and physical data especially through the harvest of wildlife, but also timber, fish, agricultural products and livestock. In essence, “sustainable use” is equated with “conservation”.

Eco-tourism is normally defined as non-consumptive use since the tourist is not taking the life of a living creature, that is, there is no harvesting. Thus, eco-tourism practices “protection” or “no use” for example in parks, where there is minimum active management which allows nature, through “natural regulation”, to take its course. However, there are major costs inherent in eco-tourism, such as pollution of the environment from sewage and solid waste due to high volumes/turnover required to generate income, and as described in Chapter 8, there are often adverse cultural impacts from wealthy tourists buying what they want from the poor living around the natural areas (e.g., prostitution, rare or endangered wild products such as seashells, black coral, ivory, python skins, etc. harvested without concern for sustainability) . So, with eco-tourism there can be consumption, although this does not take place in the classical sense.

A synthesis of information gathered from the principal author's personal experiences while an advisor to several African governments, the U.S. Agency for International Development (USAID), managing the Africa Office of Safari Club International (SCI)²¹⁶, as well as manager of the African Initiative of the Department of Nature Conservation, Tshwane University of Technology,²¹⁷ along with information provided by innovators in this field and the literature, attempts to provide insight as to where CBNRM is today and maybe also where it is going. Some attempts are made to recommend a future direction for the CBNRM process.

This chapter analyzes CBNRM as currently practiced in some of the more important programs and begins looking at how it might evolve both internally and externally. It also discusses how CBNRM must fit into a bigger plan for the economic development of the subcontinent if conservation is to be effective. The limited impacts of CBNRM on household livelihoods are discussed in more detail in Section 9.7.6.4, CBNRM will not create a "middleclass" in Africa.

9.1 THE CULTURAL DIVIDE

Community-Based Natural Resources Management (CBNRM) programs reward rural Africans for the loss of access to their resources in parks and protected areas (e.g., hunting blocks) by providing them with material compensation for foregoing traditional ties to wildlife and other resources.

However, a major cultural divide still exists between Western approaches to conservation and traditional African approaches. This divide must somehow be

²¹⁶ Safari Club International, 4800 West Gates Pass Road, Tucson, Arizona 85745-9490 USA, Main Phone: (520) 620-1220, Fax: (520) 622-1205, <http://www.safariclub.org> & conservation/education/humanitarian assistance arm - Safari Club International Foundation, <http://www.safariclubfoundation.org>.

²¹⁷ P/Bag X680 Pretoria 0001, South Africa.

overcome or preferably integrated, taking the best from both worlds, to enable wildlife in Sub-Saharan Africa to survive the onslaught of humanity in the 21st century.

The manner in which Westerners from urban industrialized societies and many urbanized Africans view wildlife has little direct economic significance. Westerners place emphasis on the intrinsic or recreational values derived from these resources. Their definitions of conservation are couched in abstract terms such as “biodiversity” and “ecosystem maintenance” and their objectives become those of the maintenance of species and habitats for aesthetic, recreational or scientific purposes (Barrow & Murphree, 1998; Murphree, 1998a). Vande weghe (2004) argues that “biodiversity” is a new word, which evolved out of biological diversity in the 1980s and has come of age since the Rio Summit. It designates “the variability of living organisms from all origins, at gene and species level as much as at ecosystem level”. He considers it an “incommensurable concept – vague and ambiguous...It is not measured but described” and thus can mean anything and everything, having become everyday jargon used in global eco-politics. Rural Africans are more concerned with sustainable productivity of wildlife as a source of revenue and protein (Barrow & Murphree, 1998; Murphree, 1998a) along with cultural, religious and spiritual ties to wildlife.

As discussed in Chapter 3, the West’s main approach to conservation in Sub-Saharan Africa is the separation of humans and wildlife through the creation of “Sherwood Forests” (parks, game reserves and hunting blocks) across the continent with the aim of declaring 10% or more of each country as parks and protected areas as established by the IUCN (see Chapter 11, Section 11.10.6 Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers). These areas have been set aside for exclusive use by rich, mostly white, tourists from America and Europe. Africans

are excluded, as they cannot afford entrance fees, hunting licenses or vehicles (most parks require a vehicle to enter). The idea of separating humans and nature is an alien concept to most Africans.

Ultimately, this approach cuts rural Africans off from legally accessing what they perceive as “their resources” and from their social, cultural, spiritual and ancestral ties to them, as discussed in Chapters 2 and 3 of this book. Mindful of the fact that co-evolution with wildlife makes “conservation” as practiced a concept difficult for them to comprehend, in addition, this alien concept disenfranchises rural Africans and turns them against conservation. Traditional hunters become poachers, as they are required to access wildlife and other resources clandestinely. Traditional controls that might have existed to manage the resources are lost through centralization of resource management and alienation of the rural populace. “Common Property Resources” become “Open Access Resources” and are mined for short-term gains. This has been a recipe for failure. Values and beliefs between Westerners and Africans are like night and day. Westerners assume material rewards will change attitudes, forgetting the mystical, ancestral and cultural ties of Africans to their resources.

Many Westerners, for example, will find it hard to believe in transmogrification²¹⁸ of a human into a wild animal, while for many Africans, this is an easily understood fact. One culture looks at this as folklore and superstition, while the other culture sees this as a normal process linking them to their spirit world (e.g., *Hommes Leopard, Mhondoro* the ancestral lion) (see Chapter 2, Section 2.1.8, Taboos as an Aid in Wildlife Management and Section 2.3.1, Land).

²¹⁸ Suggests a grotesque or preposterous metamorphosis

The real question we need to ask ourselves is not whether lycanthropy²¹⁹ or other traditional African beliefs are true or not true, any more than questioning the transformation of bread and wine into the flesh and blood of Jesus Christ by Catholics. Whether lycanthropy is physical or psychological, the question arises as to how we can overcome these cultural divides to the benefit of Africa, its people and its natural systems. Martin and O'Meara (1995) state

“it is vital for Western agents involved in negotiating the political and economic future of African nations to recognize that the culturally specific character of African social organization is not an artefact of the past, but a vital cultural resource that has the power to consolidate community identity and mobilize community action in modern Africa”.

Murphree (1995) states, with regard to the *Tchuma Tchato* CBNRM project in Mozambique, that identification and support of traditional authorities and traditional religious leaders (spirit mediums -*swikiro*) secured the project concept at an early stage and can be the key to the long-term success or failure of a CBNRM program in Africa.

Here lies the major challenge for 21st century conservation in Sub-Saharan Africa: to integrate traditional controls and beliefs, as described in Chapter 2, with Western ideas on conservation and management, something at which we have failed miserably over the last 20 years of the 20th century and here at the beginning of the 21st century. Can indigenous values (e.g., totems and taboos), controls (e.g., territory, seasonal mobility and closed seasons) and institutions (e.g., chiefs, elders and hunting guilds) now be re-empowered to help drive sustainable economic and political development? Do these institutions possess the capacity for the social, political and economic exigencies (requirements)

²¹⁹ The assumption of the form and characteristics of a wolf – in the case of Africa often of a lion, leopard or hyena as discussed in Chapter 2 - held to be possible through witchcraft and/or linked to the ancestors.

demanded by early 21st century developments (Davidson, 1992 *In: Zack-Williams*, 2002) or can they be revived?

In many cases, traditional authorities have been contaminated by clientelism and the kleptocracy typical of the post-colonial mode of governance. In many cases, the “traditional leaders” and “chiefs” of today are politically appointed to carry out the mandates of central government, robbing the rural areas of accountable leaders (Baker, 2002). The search for a functional democracy should neither ape Western institutions, nor modernize feudalism (Davidson, 1992 *In: Zack-Williams*, 2002). This applies from the level of the state down to local resource management systems. The up-and-coming generation of young Africans educated in nature conservation must determine how to integrate the old and the new by taking the best from each in an attempt to find “African solutions to an African problem”, as opposed to relying entirely on Western governance and management systems, imposed on Africans, which to date have failed. Hinz (2003) presents one of the first analyses in the possibility of using traditional authorities, now officially recognized within Namibian law, to help in managing wildlife as a result of decentralization policies. He recognizes that at the local level, there are relationships between traditional authorities, local authorities (local government), conservancy committees and regional councils that must be negotiated and clarified as to their role in sustainably managing Namibia’s natural resources.

This integration is critical, since even if they were to operate fully, it is not evident that the traditional ways of extensively managing natural resources alone are any longer viable due to the human population explosion of the 20th century and the resulting pressures for material gain placed on the resource base at the beginning of the 21st century. At the same time, Western intensive management systems, even when adapted to the African continent over 100s of years as in Southern Africa, are often rejected by traditionally living rural Africans. Given

the incredible pressure today on habitat and resources from traditional nomadism and declining fallow periods, and the smaller and smaller areas harboring wildlife (e.g., in the Limpopo Province South Africa, the average game ranch is less than 1,000 ha), intensive management of these small game ranches/areas becomes critical to prevent resource and habitat degradation while assuring that Africa can sustain itself both nutritionally and economically.

Ultimately, unless they are accommodated, international values and goals will be subverted by local responses ranging from defiance (e.g., poaching, illegal grazing, fishing and honey collection) to covert non-compliance (Murphree, 1998a) (e.g., revenge killing - attempts to eliminate wildlife so that it has no value to hunting and other forms of eco-terrorism such as burning down park headquarters and killing of park staff).

9.2 THE CRITICAL LINK, CBNRM AND ADAPTIVE MANAGEMENT IN AFRICA

9.2.1 Precautionary Principle; Studying Wildlife to Extinction

Western scientists and researchers, especially in East Africa have tended to dominate conservation using the “precautionary principle”. The protectionist approach of the precautionary principle (founded in Western urban industrialized settings where humans have lost their dependency on surviving directly off the environment) purports that wildlife and its complex life cycle must be fully understood before it can be used and that this requires time and extensive research.

What this means, in essence, is passive management of the species, allowing “natural regulation” to dominate as the management approach, which assumes

that nature will take care of itself. The best examples of this can be found in Uganda and Kenya, where American and British-based animal rights groups, and Western researchers with no management skills have taken an anti-sustainable use policy.

It needs to be made clear that research and management require two completely different sets of skills and mind sets. A researcher is trained to test hypotheses, to study and continue finding more information that will allow him/her to better understand how a system or organism functions. This is often a life-long pursuit. On the other hand, managers, relying on available information, are trained to take action (e.g., cull, burn, introduce more game, etc.) in order to manage an area while identifying data gaps. As the data gaps are filled, a more complete picture develops and better decisions can be made as to the manipulation of a natural system to achieve management objectives (e.g., trophies, meat, higher predator population and greater biodiversity). Researchers are action-oriented people. Ideally, a protected area-manager will have access to researchers to help fill data gaps. For instance in the KwaZulu-Natal Nature Conservation Service (KNNS), reserve managers call in researchers as needed, but not the other way around.

Unfortunately, in places like Kenya and Uganda, primarily American and British researchers run the show with donor backing, and either because of philosophical differences and/or fear of the unknown, there is no management. As a result, in the average rural area, there is little or no added value from wildlife (Kenya allows game cropping for a limited national market and there is bird shooting/Uganda has a pilot trophy hunting program - see Chapter 11, Section 11.11.2.8, Pilot hunting scheme), so rural people are making a wise decision by eliminating the game and converting the habitat to something that can earn them a livelihood (e.g., livestock pasture) or alternatively selling off these assets (e.g., to

be converted into small farms and commercial wheat schemes) as they opt out of “valueless wildlife” as a land use and head to the cities.

In modern Africa, where nature is increasingly surrounded by human fences so that wildlife cannot disperse as its numbers increase, such an approach is a recipe for disaster with risks of over-population, habitat destruction, increased human/wildlife conflicts, a loss in biodiversity and possible population crashes. In Africa, by the time wildlife has been studied extensively enough to please proponents of the “precautionary principle”, rural communities, in trying to survive, may have opted for other land uses, resulting in the elimination of the very wildlife-critical habitat one was hoping to conserve.

9.2.2 “Adaptive Management”

Child, G. (2004b *In:* Child, B., 2004a) explains the management phases that Southern Africa’s parks and protected areas evolved through:

- 1. Phase 1, “military mentality”** (e.g., anti-poaching, burning).
- 2. Phase 2, “stock-raiser’s mentality”** military management combined with a build up of herbivore numbers (e.g., elimination of predators such as in the Kruger Park in South Africa, where 19,440 mammals, birds and predators were killed from 1903-1927 or the Hwange Park, Zimbabwe, where wild dogs were shot as late as 1960) and viewing opportunities for tourists (e.g., boreholes to concentrate wildlife, resulting in over-grazing, bush encroachment and the loss of perennial grasses needed for soil stability in savannas and the loss of obligate grazers such as roan and sable in favor of mixed feeders such as kudu and impala and bulk feeders such as elephant, hippo and buffalo – see Chapter 6, Section 6.2, BOREHOLES AND WILDLIFE).

3. Phase 3, “era of ecologists”, 1950s-1970s, development of range management principles, abolition of predator control and more control over the placement of boreholes and the attempt to eliminate wildfires, while using controlled burning to fulfill management objectives and understanding that these areas are not self-regulating ecological units and are best controlled using what became known as “adaptive management”, emerging in the 1960s. The Transvaal Provincial Administration Nature Conservation²²⁰ authority of South Africa did not adopt adaptive management principles until the 1980s (Reilly, *pers. comm.*).

“Experience in the region has shown that the process of adaptive management with its negative feedback loop is essential for the sustainability of CWM²²¹. The dynamic nature of rural communities and the resource base requires an approach that allows for fine tuning as the program develops” (IUCN/SASUSG, 1997).

The adaptive management approach relies on a crude evaluation of wildlife resources based on available data on a specific species in order to make conservative estimates of sustainable off-take. This off-take is monitored while data gaps are identified and filled to help make better management decisions on how to best utilize wildlife as an economic and rural development tool for rural Africa:

- Preliminary but conservative quotas based on field surveys;
- Adjusting quotas annually based on an appropriate and cost effective wildlife monitoring program [e.g., trophy quality, hunting success, hunting effort, herd structure and size, recruitment, aerial

²²⁰ This was the name of the pre-1994 body that since 1995 has been divided into Limpopo, Gauteng, Mpumalanga and Northwest Provinces, each with their own conservation administration.

²²¹ Community Wildlife Management – basically CBNRM

surveys (if available), along with decision support, rainfall, pasture quality]; and

- Based on a theoretical off-take of only 2-5% of annual game population for trophies and another 10-25% for meat.

Adaptive management is the basic tenet of Southern Africa's approach to sustainable use. It is a pre-requisite for CBNRM to begin, since poverty, despair, alienation and disenfranchisement will not wait for Western scientists to study wildlife and its habitat to the detriment of the people and their resources.

Duffy (2000) believes that sustainable use is possibly the only means of ensuring the survival of wildlife in Sub-Saharan Africa, by halting the conversion of key wildlife habitat to other land uses. She also states that preservationist policies have proven politically untenable, resulting in wildlife being removed from Sub-Saharan Africa because local people have no reason to conserve wildlife that has no value beyond the aesthetic. It is believed that these two divisions are a bit simplistic. Certainly, as has been demonstrated, rural communities have strong cultural and religious ties to wildlife that makes it in their interest to conserve it. However, as we shall see, people living in poverty and at a subsistence level do not have the luxury to plan for the long-term and land hunger throughout the continent makes it difficult for rural people to justify conserving wildlife today, unless the wildlife and its habitat are part of their short-term survival portfolio. As we shall see, sustainable use linked to CBNRM has an important role to play, but alone is likely to fail unless it becomes part of a bigger picture plan for developing the continent!

9.3 COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT (CBNRM) PROGRAMS – PART OF THE WAY FORWARD

CBNRM is not the answer, but one of a number of conservation strategies that may have merit outside parks. More and more, it may also include parks and the use of resources within parks as is discussed here and in Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers. For CBNRM to work, it must continue to progress towards people living on the land having ownership over the land, wildlife and other resources, and the right to sustainably use and directly benefit from these resources. Currently, CBNRM is too top-down and patronizing (Murphree, 2001 *In:* Baldus, Hahn, Kaggi, Kaihula, Murphree, Mahundi, Roettcher, Siege & Zacharia, 2001; Murombedzi, 2003 *In:* Adams & Mulligan, 2003). The idea of involving communities in conservation has evolved over the last 25 years and is continuing to do so (Roe, Mayers, Grieg-Gran, Kothari, Fabricius & Hughes, 2000). Initiatives include:

- **The 1980 IUCN “World Conservation Strategy”,** which stressed the importance of linking protected area management with the economic activities of local communities (Roe, *et al.*, 2000) and which led to the development of national conservation strategies.
- **The 1982 World Congress on National Parks in Bali,** which called for increased support for communities through education programs, revenue-sharing schemes, participation in the management of reserves and the creation of appropriate development schemes near protected areas (Roe, *et al.*, 2000).

- **The Wildlife and Human Needs Program** launched in 1985 by the World Wildlife Fund (WWF), which attempted to combine conservation and development (Roe, et al., 2000).
- **The 1986 World Bank “Policy on Wildlands”**, which recognized that the protection of natural areas must be integrated into regional economic planning (Roe, et al., 2000).
- **The Rio Declaration of 1992 Leading to the Convention on Biological Diversity (CBD)**, which arose out of the 1992 UN Conference on Environment and Development in Rio de Janeiro and emphasized three equally important objectives: conservation, sustainable use of biodiversity resources and the fair and equitable sharing of benefits with local indigenous people, thus placing community involvement in wildlife conservation and management firmly on the international agenda (Roe, et al., 2000). Article 22 of the Rio Declaration on Environment and Development (UN, 1992a) supports indigenous management and knowledge systems as critical to sustainable development, as well as cultural ties to natural resources (Koch, 2004 In: Fabricius, Koch, Magome & Turner, 2004). The CBD (UN, 1992b) puts people at center stage in promoting fair and equitable benefit sharing and sustainable use (Fabricius, et al., 2001). Also arising out of Rio were the Statement of Principles for the Sustainable Management of Forests (UN, 1992c) and Agenda 21 (UN, 1992d), a comprehensive global plan of action addressing humans and their impacts on the environment (UN, 2003). Agenda 21 provides an overview of key issues that must be addressed in the 21st century to link conservation and development including (UN, 1992d):
 - Social and economic dimensions including poverty, health, human settlement and linking environment and development in decision-making;

- Conservation and management of natural resources for development including integrated planning and management of land resources, deforestation, desertification, fragile alpine ecosystems, sustainable agriculture and rural development, biodiversity, biotechnology, management of oceans and coastal zones and their resources, protection and management of freshwater, management of toxic substances, hazardous wastes and radioactive substances and solid waste and sewage management,
- Strengthening the role of major groups in conservation and development including women, children and youth, indigenous people, NGOs, local authorities, workers and trade unions, business and industry, scientific/technological community and farmers; and
- The majority of funding for Agenda 21 in developing countries is to come from the 0.7% GNI/GNP²²² of the developed/industrialized countries in the form of foreign aid also known as Overseas Development Assistance (ODA) (UN, 2003). As is seen in Chapter 11, Section 11.7.1, Foreign Aid as Portion of Donor Country GNP, only six of 22 developed countries met this goal in 2003. Funding for CBD, work plans and operational and research projects is provided by the Global Environment Facility (GEF) managed jointly by the World Bank, UNDP and UNEP and paid for by industrialized countries (Fairhead & Leach, 2003). GEF also supports Agenda 21 (UN, 1992d). However, “ ‘the central feature of the GEF is that it exists to meet the incremental costs of global environmental benefits. It would not therefore be appropriate for it to be the funding mechanism for other

²²² Gross National Income (GNI) = Gross National Product (GNP). See Footnote 48, Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA.

conventions that are designed to achieve national or regional benefits' " (Dalyell, 1993 *In: Colchester, 1994*).

"Many of these projects of 'global benefit' have very worrying implications for indigenous peoples. Since GEF funded projects or project components are, by definition, not in the national interest, the projects have the effect of marginalizing indigenous peoples' concerns" (Colchester, 1994).

- **The "Earth Summit" or 2002 World Summit On Sustainable Development (WSSD) in Johannesburg, South Africa,**

"views of civil society were given prominence at the Summit in recognition of the key role of civil society in implementing the outcomes and in promoting partnership initiatives. Over 8,000 civil society participants attended the Summit, reinforced by parallel events which included major groups, such as, NGOs, women, indigenous people, youth, farmers, trade unions, business leaders, the scientific and technological community and local authorities as well as Chief Justices from various countries" (WSSD, 2002).

The full implementation of Agenda 21, the Program for Further Implementation of Agenda 21 and the Commitments to the Rio principles were strongly reaffirmed at the WSSD (UN, 2003).

- **The Durban Accord** of the 2003 World Parks Congress, which concluded the following:

"We see protected areas as vital means to achieve this synergy efficiently and cost-effectively. We see protected areas as providers of benefits beyond boundaries—beyond their boundaries on a map, beyond the boundaries of nation-states, across societies, genders and generations...We voice concern that many costs of protected areas are borne locally—particularly by poor communities—while benefits accrue globally and remain underappreciated...We voice concern that many protected area

practitioners lack access to technology, knowledge, lessons learned and best practice models for effective and adaptive management. We voice concern that the capacity of our younger generations to participate in the new protected area agenda is insufficient...We urge commitment to ensuring that people who benefit from or are impacted by protected areas have the opportunity to participate in relevant decision-making on a fair and equitable basis in full respect of their human and social rights. We urge commitment to protected area management that strives to reduce, and in no way exacerbates, poverty. We urge commitment to protected area management that shares benefits with indigenous peoples and local communities. We urge commitment to innovation in protected area management including adaptive, collaborative and co-management strategies. We urge commitment to recognize, strengthen, protect and support community conservation areas...We urge commitment to innovative and diversified income generation strategies, thereby securing predictable financial returns for payment to the stewards of ecosystems goods and services" (WPC, 2003).

Additional agreements affecting people - natural resource relationships in Sub-Saharan Africa include (Fabricius, *et al*, 2004):

- The “**Protocol on Tourism Wildlife and Law Enforcement**” of the Southern African Development Community (SADC), which calls for economic and social incentives from conservation and the sustainable use of wildlife;
- The “**Protocol on Shared Watercourses**” of SADC, which respects customary laws;
- The “**World Heritage Convention**” on the protection of the world cultural and natural heritage, which integrates cultural and biological conservation;
- The “**Convention to Combat Desertification**”, which has the participation of communities as a core principle;
- The “**Ramsar Convention**” or “**The Convention on Wetlands of International Importance Especially Waterfowl Habitat**”, which

advocates wise use of wetlands as economic, cultural and recreational values;

- **The “International Covenant on Civil Rights and Political Rights”,** Human Rights Committee, General Comment 23, Article 27, 1994, which stresses the rights of indigenous people to land resources including hunting and fishing and the right to live in reserves protected by law;
- **The “International Labor Organization (ILO) Convention”,** which recognizes the rights to land of indigenous people, with Article 11 stating that Aboriginal title is embedded in memory and does not depend on an act of state (see Chapter 11, Section 11.10.1, Foreign Aid for “Conservation”? for further discussion);
- **The “Dana Declaration on Mobile People and Conservation”,** which recognizes the contribution that nomadic people can make to conservation;
- **The “Principles and Guidelines on Indigenous Traditional Peoples and Protected Areas”,** IUCN World Conservation Union Resolution 1.53, 1996 amended in 1998, which calls for the development of policies in protected areas that safeguard indigenous people with respect to customary practices and traditional land tenure systems; and
- **The “Man and the Biosphere Program”** guidelines of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which call for the linking of communal lands to conservation areas through buffer zones.

The Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora is mentioned, but as is seen in Chapter 10, CITES tends to ignore economic incentives and the integration of indigenous people into the management of Africa’s flora and fauna in favor of trade sanctions, which create black markets, making management impossible.

Thus, there is a growing realization and acknowledgement that indigenous people living within or peripheral to most parks and protected areas must play a strong role in conservation and see development evolve from benefits accrued through conservation. Except CITES, the above conventions and accords begin recognizing that indigenous people must be involved in determining how protected areas are managed and what they are managed for. This may fly in the face of what Westerners want from conservation. In fact, it is rural people, not governments, who will ultimately determine the future of protected areas.

However, achieving results on the ground, as the case studies in this chapter and Chapter 11 show, is another story. The interventions by Western donors, their NGOs and African governments violate many of these agreements and in the 21st century are still destroying the lives of indigenous people, compressing them into areas that will not support them and creating exclusion zones that in the past provided them with a vast array of resources necessary for their survival. To date, most of these CBNRM programs have been failures,

“generally paternalistic, lacking in expertise, and one-sided—driven largely by the agendas of the conservationists, with little indigenous input”,

most conservation NGOs being unsuited to deal with social and economic issues (Chapin, 2004).

9.3.1 Defining Community

“Most attempts to link biodiversity conservation to development of local people are flawed for two reasons. The first is the dogged belief by most policy-makers and practitioners that the ‘community’ exists and that its is the best vehicle for implementing biodiversity programs. The notion that a ‘community’ is a group of homogenous people, all with common interests and beliefs, is

false...The second flaw is a strong belief that the ancient rural past – prior to modernization – was compatible with nature and that it can be easily recreated. However, there can be no return to a harmonious state of nature. Hence, the pieces of the puzzles rarely fit because the issues surrounding biodiversity conservation continually present themselves as moving targets in a fierce battlefield of competing and conflicting interests” (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003).

Roe, *et al.* (2000) in the review and summary of a number of regional reports on CBNRM by the International Institute for Environment and Development (IIED) under the rubric “Evaluating Eden”, provide the following insights to “community”. In general, as a starting point for the Evaluating Eden analyses, the following definition is provided

“Community: a grouping of people associated in spatial, social, cultural or economic terms which occupy, have access to, or have a legitimate interest in, a particular local geographic area”.

The Southern Africa analysis defined community as,

“a figment of the imagination of project managers and donors seeking quick fixes. The common belief amongst donors and project managers is that it saves time to group people together, because of the simplicity of working with fewer groups”...”. A community in the Southern African context is defined as a group of people with a self-defined collective identity. Thus there exist ‘communities of interest’ (people who have defined themselves as belonging together because of sharing the same interests, or pursuing the same livelihood strategies)”.

Thus, within a given village or among a number of villages there may be a number of “livelihood clusters” or “communities of interests” (e.g., traditional hunters, fishermen and honey collectors). The assumption that a village or group of villages is/are composed of one homogenous community all with common interests is one of the major reasons for conflicts in CBNRM programs.

The West and Central Africa report points out

“that many communities defy definitions based on spatial or social criteria, since many people are often transient. They suggest that ‘community’ is better understood as a number of common interest groups between whom management of wildlife resources must be negotiated”.

The South East Asia analysis defined community as,

“a socially and geographically defined group of people living near, or dependent on, species/ecosystems which are sought to be conserved”.

However, they go on to say that

“communities can also be fragmented by social, political, or economic differences, some of which can deny the opportunity to real resource users to participate in decision-making”.

The Central American analysis defines community as,

“people who share a space - village, town, farm, forest - and who share some social and cultural characteristics”.

IIED (1994 *In: Roe, et al., 2000*) tends to agree with the Southern African conclusions that

“what may appear to be a community on the ground (i.e. in spatial, social and cultural terms) may in fact be deeply divided in relation to individuals’, institutions’ and households’ interests in, and control over, different kinds of wildlife” or resources.

Roe, *et al.* (2000) conclude that for the purpose of CBNRM:

- Communities are fluid and constantly redefine themselves;
- Different livelihood groups (e.g., hunters, fishermen, sawyers and charcoal makers) or communities of interest exist within the same geographically defined community; and
- It appears to be more useful to use resource management groupings or 'clusters' rather than geographical entities to define communities.

Junge (2004) found that rural communities in Sub-Saharan Africa were not homogenous, varying within and between communities based on age, gender, social group, poverty, wealth, education, livelihood strategies and capabilities. While a community may be defined: 1) spatially, within a defined geographic area, 2) socially, with a common history and cultural heritage often based on kinship, and 3) economically, with groupings sharing interests and control over particular resources, Junge (2004) also raises issues over the fluidity and dynamics of continually changing community membership as a result of forced relocation, migration, rural/urban labor resource flows and changing agricultural practices such that clearly bound social and residential units may not be present.

As individuals become involved in CBNRM at an on-the-ground level, great care must be given as to what a community is in order to avoid, as is seen in some case studies below, the chief or group of community elites absconding with the benefits to the exclusion of the majority. Thus CBNRM decision-making bodies must be representative of various interest groups or stakeholders (e.g., clans, villages, women, youth, loggers, charcoal makers, fishermen, hunters, honey collectors, traditional medicine herbalists who collect their remedies from the bush and thatch grass collectors among others) linked to a defined geographical area to assure that everyone's needs are integrated into the program, the

management of the natural area in need of protection, and to assure that as many people as possible, both collectively and at the household level, receive benefits.

As is seen below, in most CBNRM programs, the integration of household livelihood and livelihood needs is often ignored, while the greater community, (the village or villages surrounding the natural areas) is expected to be happy with common property benefits such as schools, clinics and boreholes. This policy has and is failing where such approaches continue. For instance, Long (2004) states that in Namibia's CBNRM process, and this reflects CBNRM in general, while governments and NGOs are proponents of creating various broad-based bodies such as conservancies, trusts, section 21 companies, associations, etc., most resource use and management decisions take place at a household and inter-household level. For instance, despite attempts at community game meat distribution in Namibia's conservancies that tends to be irregular and often a once a year affair, 25% continue to depend on the illegal harvest (poaching) of both large and small mammals as important to their livelihoods. Thus, two different levels of resource management and decision-making exist within CBNRM areas: household/individual resource users/specialists and "conservancy". This has the effect of distancing primary resource users from resource management decisions of the "conservancy", resulting in a need to integrate this lower level of decision-making into planning and decision-making at the higher level.

9.3.2 Defining Wildlife in the Context of CBNRM

Roe, *et al.* (2000) conclude after looking at all regional analyses of "Evaluating Eden" that "wildlife" is best defined as including "animal and plant resources and their habitats". This makes sense given the diverse array of resource users as noted above that must be integrated into management of natural areas, if these areas are to be of value to local residents at all levels, helping to assure the

sustainable use of the natural systems in question and their survival from degradation (e.g., over-exploitation or mining for short-term gains) or conversion to other land uses that people feel can provide them with improved livelihoods. Unfortunately, most current CBNRM programs, as discussed below, are too narrowly focused on generating revenue from wildlife through trophy hunting.

9.3.3 Defining CBNRM

CBNRM is said to be about sustainable use of natural resources outside the park estate. What about within the park estate? Critics say that CBNRM is based on the assumption that “community” is defined as small-scale human groupings socially bound by a common cultural identity, living within defined spatial boundaries, interacting on a personal rather than bureaucratic basis, and having an economic interest in common pool interests of the area. Such conditions rarely exist in that local settlements are often culturally heterogeneous, economically stratified, boundaries are porous and social cohesiveness is fragile. Thus, CBNRM cannot be based on a “definition” for community. CBNRM is directed towards the collective management, use and controls on use of “Common Property Resources”, with benefit derivation and distribution from such use. It is directed at local levels, below large bureaucratic units created by governments at national or district levels (e.g., below District councils). CBNRM is about local collaborative regimes of natural resource management with defined membership and jurisdiction. It is not about private individual ownership (e.g., commercial game ranches), unless they choose to collaborate communally as in a conservancy (Murphree, 2001 *In:* Baldus, *et al.*, 2001).

Barrow and Murphree (1998, *In:* Roe, *et al.*, 2000) identify three categories of community conservation that have emerged in Africa (see Table 9.6):

- “Protected area outreach”: seeks to enhance the biological integrity of parks by working to educate and benefit local communities and enhance the role of a protected area in local planning (e.g., Integrated Conservation and Development projects – ICDPs). Jones and Murphree (2004 *In: Child, B.*, 2004a) describe this as the “fences and friends” approach;
- “Collaborative management”: seeks to create agreements between local communities or groups of resource users and conservation authorities for negotiated access to natural resources, which are usually under some form of statutory authority. Jones and Murphree (2004 *In: Child, B.*, 2004a) describe this as the “no-fences and mutual benefit” approach; and
- “Community-Based Natural Resource Management (CBNRM)”: the sustainable management of natural resources through returning control over or responsible authority for these resources to the community. This is basically devolution if carried out in full.

“CBNRM builds on the price-proprietorship-subsidiarity paradigm. If the resource is valuable (price), if this value is captured by landholders (proprietorship) and if the principle is followed that no management action, decision or benefit is arrogated to a higher level when it is better and more appropriately conducted at a lower level (subsidiarity), there is a high likelihood of successful resource conservation and management” (Child, in preparation *In: Jones & Murphree, 2004 In: Child, B.*, 2004a).

As is seen in this chapter, CBNRM has gone through a number of stages, with the ultimate goal of “devolution” or full ownership. Devolution or full ownership implies management rights, decision-making rights for the use of the resource(s) and the right to benefit from a given natural area by the community stakeholders/interest groups. It should imply tenure over land and associated natural resources. As mentioned throughout in Fabricius, *et al.* (2004), the evolution of CBNRM is not linear in nature. There is not any real blue print to success. While guidelines are provided in this chapter, each CBNRM program

must be dealt with down at the level of the producer communities for a given area that is to be placed under management. Different cultures, individual personalities and national policies, among others, will impact on how CBNRM is structured and evolves. Some of the newer CBNRM programs have bypassed earlier stages, learning from the older programs.

Most CBNRM programs are quite far from achieving the goal of full devolution, being at some level of co-management as defined by Hasler (1999 *In: Roe, et al.*, 2000), collaborative negotiated management as defined by Dubois, 1997; Agarwal, 1997; Zeba, 1998²²³ (all *In: Roe, et al.*, 2000) or decentralization (Murphree 2001, *In: Baldus, et al.*, 2001) most often in collaboration with government, the private sector and conservation/development NGOs. The reasons behind the failure to achieve full devolution are discussed (see Section 9.7.2, Reluctance to Devolve Control and Ownership of Resources to Landholders).

Steenkamp (2000) is not convinced that co-management is necessarily advantageous to local people or to biodiversity conservation. Livelihood concerns are not automatically incorporated into their design, a major weakness, nor do they always provide the best guarantee for efficient conservation development and biodiversity management, especially if local livelihoods/access to resources have not been adequately negotiated. Formal frameworks of CBNRM and co-management regimes tend to clash with the cultural, economic and political realities on the ground. As is seen, in many cases this so-called co-management “Conservation with the People” is a way for governments and the private sector to take control over and expropriate the majority of the wealth from the resources that should be accruing to local communities and traditional resource users. Thus, devolution becomes aborted.

²²³ Referred to as “West and Central African Report”

Unfortunately, until these middlemen are out of the picture and until rural communities break these shackles of bondage, it is the former who will reap the majority of benefits, be it the government and private sector (safari and tour operators) or indirectly from living off donor handouts (NGOs) with minimal benefits returning/reaching the people on the ground. In fact, as is demonstrated in this chapter and Chapter 11 on foreign aid, very often at both the household/family level and “community level”, rural stakeholders are worse off under CBNRM than if they had been left alone to their own ways and traditions.

Many of the constraints to the orderly evolution of CBNRM must be seen as remnants of colonialism that have been imposed on rural communities over the last 40 years of independence by political elites in mostly non-representative governments. More recently, Western donors and their surrogate NGOs have taken the reins in imposing their wishes on rural communities. As is seen below, a key to helping rural stakeholders break this bondage will be to get a critical mass educated to the point that they know what they have with regard to its value, how to sustainably manage it and that they are able to effectively stand up for their rights. Then and only then can one hope for full devolution. As is seen, serious tertiary (university) education has not been one of the strong points of CBNRM. One must ask “why”? and it is believed that the “why”? is that it would weaken the stranglehold that governments, the private sector and NGOs have on the resources that should belong to rural communities and serve as their catalyst for development from their sustainable use.

9.4 ORIGINS OF CBNRM IN AFRICA

As noted in Chapter 2 of this book, prior to the start of the colonial era, resource management was largely carried out in the informal sector. These resource

management systems were sustainable in the sense that they had survived until the 19th century, prior to the advent of colonialism.

During the 20th century, revival of informal sustainable resource management systems was prevented by the centralization of management controlled by bureaucracies (see Chapters 3, 4, 5, 6 and 11). This disenfranchised local communities from their resources, through such practices as license controls, protection policies and enforcement through a coercive paramilitary culture (Peluso, 1993; Hitchcock, 2000a *In:* Marks, 2001). Parks, game reserves and hunting blocks were formed that excluded local people through “fortress conservation” or the “fence and fines” approach. This approach has failed (Junge, 2004).

Control of resource use, previously largely the domain of traditional leadership, was progressively alienated to government. By the 1970s, legal access by rural communities to wildlife had become virtually impossible throughout much of the subcontinent. However, by the 1970s and 1980s, the ability of governments to enforce sustainable use of resources began to be reduced due to constraints of capacity and resources. This led to the progressive withdrawal of government from the direct control of resource use, often delegating authority to third parties, or leaving a vacuum of authority resulting in conditions of “open access” to these resources. In either case, this situation is generally recognized as a sufficient condition for “unsustainable resource use” and for highly inequitable access to resources with monopolization by elites. Examples are the transfer of customary land to estates in Malawi (Chapter 5), the monopolization of vast tracts of natural areas by a few large safari operators, tourism companies (Bell, 1999) and logging companies or NGOs (Chapter 11 for the last two examples), as seen all over Sub-Saharan Africa.

The problems of access and sustainable management were exacerbated by the population explosion in the 20th century. By the 1970s, conservationists were becoming concerned that protected areas created at the end of the 19th through to the 20th century were becoming islands surrounded by a sea of poverty; vulnerable to encroachment and the poaching of wildlife (Marks, 2001). Conservationists were convinced that wildlife would disappear unless local communities became more integrated with and benefited from these areas (Marks, 2001). Hulme (1997) and Barrow and Murphree (1998) believe that CBNRM is widely accepted by the Washington Consensus market driven theories of the 20th century, where wildlife is a commodity and the role of government in market economies is diminished - becoming widely favored by Western donors and NGOs. As will be seen, policy-makers, academics and practitioners have come to question this neo-liberal approach (Fabricius, *et al.*, 2001), at least as it is currently practiced.

It also fits well with neo-populist ideas of returning “power to the people”, participation, decentralization and increasing the use of indigenous knowledge in decision-making, where cultural and spiritual values, in addition to market forces, are key determinants in how people relate to wildlife. Both schools believe that the role of the state is to create an enabling environment in which conservation and development can take place, but not to administer them (Hulme, 1997).

In Southern Africa, by the 1960s and 1970s, there was a growing appreciation that the loss of habitat and competition with domestic stock were the primary causes for the continued decline of wildlife outside parks and protected areas, resulting in various degrees of users’ rights being conferred onto commercial (white) farmers: Zimbabwe 1960 and 1975, Namibia in 1967 (Bond, Child, de la Harpe, Jones, Barnes & Anderson, 2004 *In:* Child, B. 2004a) and South Africa between 1967 (Mulder, *pers. comm.*)²²⁴ and 1968/9 (Lambrechts, *pers. comm.*),²²⁵ when game

²²⁴ Dr. Piet Mulder, retired Head of the Department of Agriculture, Conservation and Veterinary Services, Gauteng Province, South Africa, Tel: 27 (0) 12-567-2975, p fsmulder@mweb.co.za.

fenced farms received exemption permits that gave landowners year-round control over their wildlife as a commodity/economic resource.

At about the same time, pioneering work in game ranching was undertaken by American Fulbright scholars Thane Riney, Ray Dasmann and Archie Mossman in Zimbabwe, demonstrating its economic and ecological viability (Child, G., 2004 *In: Child, B., 2004a*). While initially, wildlife as a fugitive resource was seen as a low value source of protein with a limited market because of veterinary restrictions, new production systems evolved, converting grazing into services where economic output was less directly linked to ecological output/primary production by giving added value from a combination of trophy hunting, photo-tourism, meat production (Bond, *et al.*, 2004 *In: Child, B. 2004a*) and even live sales.

Livestock or wildlife used purely for meat production depends on a direct link between primary (grass/browse) and secondary production (meat), often requiring the rancher to over-stock his range for short-term economic gain resulting in habitat degradation from mining environmental capital. Even after five decades of subsidies, only 5% of the cattle enterprises in Zimbabwe were profitable, while wildlife proved to provide a better return on investment (Bond, *et al.*, 2004 *In: Child, B. 2004a*).

The legislation providing ownership of wildlife to commercial farmers, pioneering research and improved terms of trade for wildlife resulted in the development of an important wildlife-based economy in Southern Africa on private land (Bond, *et al.*, 2004 *In: Child, B., 2004a*).

²²⁵ Lampies Lambrechts, former Director of Conservation Services, Transvaal Chief Directorate of Nature Conservation, the Old Transvaal, South Africa, 27 (0) 82-556-6158, lampies@netactive.co.za.

Trophy hunting provided tremendous value from harvesting only about 2-5% of the annual population by species, while another 10-25% could be harvested for meat, the total percentage off-take corresponding more or less to the annual population growth rate. In Southern Africa, trophy hunting served as the “embryo of conservation” outside parks on white commercial ranches (SCI African Chapter, 1996), providing a low investment incentive to build up wildlife populations, generate income to build photo-tourism lodges and have adequate game as a source of meat/protein. Wildlife, once a fugitive resource, became a commodity that was bought and sold. Closure of hunting in Kenya in 1977, civil wars in Uganda (1972-1985) and Sudan (1983 to present) (Bond, *et al.*, 2004 *In:* Child, B. 2004a), and the temporary closure of hunting in Tanzania from 1973-84 (Bonner, 1993)/1973-1978 (Baldus & Cauldwell, 2004) helped orient overseas hunters to Southern Africa and aided in the development of this industry. The extensive conversion of semi-arid rangelands to wildlife production really took off in the late 1980s (Bond, *et al.*, 2004 *In:* Child, B. 2004a).

The successful devolution of authority to the private sector over wildlife that eventually spread to Namibia, South Africa, as well as Botswana, Zambia and to a lesser degree Mozambique opened the door for the next step, thereby taking the concept of devolution into communal areas. Namibia and Zimbabwe were at the forefront concerning the devolution of authority to landowners to manage the wildlife on their land, arguing that unless wildlife provided tangible benefits to private landholders it would disappear outside state parks and protected areas. From 1971, Zimbabwe and Botswana led the debate on what has become known as CBNRM, while Zambia independently came up with similar ideas (Child, G., 2004 *In:* Child, B., 2004a). Bell (1999) believes that CBNRM developed out of two main strands in the Southern African region.

9.4.1 The Conservation Strand

Government control of wildlife and other biological resources was not working, a trend that was exemplified by the wave of elephant and rhino poaching in the 1970s and early 1980s. Classical law enforcement was failing. It was recognized that the alienation of access by rural communities provided no incentive for community participation in law enforcement; in fact, it led to quite the opposite. This strand of CBNRM, then, developed as an attempt to recreate a set of economic and social incentives that would motivate rural communities living with wildlife to participate in preventing illegal off-take. In most cases, as is discussed below; the social incentives have been largely overlooked (Bell, 1999).

9.4.2 The Social Equity Strand

The primary motivation was to redress the problems of rural poverty and inequitable access to resources. A major stimulus to this agenda was provided by the collapse of legitimate earning power over much of Africa in the 1970s and 1980s, which strongly exaggerated the problem of rural poverty (Bell, 1999), linked to the oil crisis and impacts of structural adjustment policies (SAPs) on national economies (see Chapter 12).

Simultaneously, with the peak of the West's environmental movement in the 1970s and 1980s, there was a push to link conservation to development. The International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU), through the World Conservation Strategy (IUCN, 1980), promoted the concept of linking conservation and development through donor assistance. This concept was further refined and confirmed by the Convention on Biological Diversity (CBD) of 1993, with 175 signatory nations supporting the conceptual role of indigenous and local communities in conserving biodiversity and

maintaining their traditional knowledge and practices through “conservation” and its antecedent, “sustainable use” (Glowka, Burhenne-Guilmin & Synge, 1994 *In: Marks*, 2001), originating with the Gifford-Pinchot philosophy as described in Chapter 3. As is discussed in Chapter 11 (Section 11.10.6.2, “Conservation and development” a continuation of failed “integrated rural development” linked to “preservation”), while they may be good at one or the other, very few NGOs are good at both conservation and development as an integrated concept.

CBNRM and similar community-based wildlife management (CWM) programs aimed to (Fabricius, *et al.*, 2001):

- Implicate communities voluntarily into the development of long-term solutions linked to natural resources in the hope of co-opting resource users into sustainable management activities as opposed to subversive plundering of resources by rural communities. The latter was taking place because of resource and land tenure changes and was a way for a rural community to show dissatisfaction with prevailing conservation laws and legal access to resources;
- Introduce the “new system” of group resource ownership and territorial rights with their management under the custody and control of resident communities;
- Provide appropriate institutions under which resources can be legitimately managed and exploited by local people for their direct benefit in the form of income, employment and meat;
- Provide financial and technical assistance to communities joining the program to help them achieve their objectives;
- Promote development using wildlife in rural areas and thereby diversifying out of agricultural-based systems into tourism and natural resource use; and

- Promote conservation of wildlife outside protected areas, thereby promoting protection within protected areas through these buffer zones since law enforcement within protected areas was inadequate.

Western donors, especially America, backed a number of similar programs in East and Southern Africa:

- ADMADE - Zambia, “Administrative Management Design for Game Management Areas (ADMADE)” funded by the U.S. Agency for International Development (USAID) through the Wildlife Conservation Society (WCS) of the New York Zoological Society;²²⁶
- NRMP – Botswana, “Natural Resources Management Program”, also called Botswana Community Trust Program funded by USAID through a U.S. consulting firm, CHEMONICS;²²⁷
- LIFE – Namibia, “Living in a Finite Environment (LIFE)” run through WWF/USA²²⁸ and funded by USAID;
- SCP - Tanzania, “Selous Conservation Program (SCP)” funded by the German funding agency- GTZ;²²⁹
- LIRD – Zambia, “Luangwa Integrated Resource Development Project (LIRD)” funded by the Norwegian Agency for International Development (NORAD);²³⁰ and

²²⁶ The Wildlife Conservation Society, 2300 Southern Boulevard, Bronx, New York 10460, Tel: 718-220-5100, <http://www.wcs.org/>

²²⁷ Chemonics International Inc, 1133 20th St. NW, Washington, DC 20036, Tel: 202-955-3300 Fax: 202-955-3400. <http://www.chemonics.com/>

²²⁸ World Wildlife Fund, 1250 24th Street, NW, Washington, DC 20037, (202) 293-4800 <http://www.worldwildlife.org/>

²²⁹ GTZ Wildlife Program in Tanzania, P.O. Box 1519, Dar es Salaam Tanzania, Tel: +255-22 2866065, Fax: +255-22 2116504, Office: "Ivory Room", Nyerere Rd., E-mail: scp@africaonline.co.tz , <http://wildlife-program.gtz.de/wildlife/scp.html>

²³⁰ Norwegian Agency For Development Cooperation, (NORAD), P.O. Box 8034 Oslo Dep. N-0033, Norway, Tel.: +47 22 24 20 30, Fax: +47 22 24 20 31 <http://www.norad.no/english/index.html>

- *Gestion des Terroirs* - Burkina Faso, World Bank,²³¹ recent program of the 21st century.

As is seen below, even the Communal Areas' Management Program for Indigenous Resources (CAMPFIRE), designed by Zimbabweans to address the inadequacy of centralized management over the illegal off-take of wildlife by alienated rural Africans, was eventually high-jacked by the U.S. Government.

Thus, CBNRM is not at all about how people interact with wildlife and other resources in their daily lives, but about projects and programs. Pushed and funded by Western donors, millions of dollars have been spent to integrate conservation and human welfare (Marks, 2001; Murombedzi, 2003 *In:* Adams & Mulligan, 2003) and there are lessons to be learned. The institutionalization of community conservation in Africa through policies, programs and projects is largely a product of initiatives by international conservation agencies endorsed by state governments, shaped by conservation professionals and their NGOs, and funded by international environmental grant sources (Barrow & Murphree, 1998). Thus, CBNRM has been mainly donor-driven and top-down, full of Western urban biases about what drives a person to believe in conservation. De la Harpe, Fernhead, Hughes, Davies, Spenceley, Barnes, Cooper and Child (2004 *In:* Child, B., 2004a) conclude that driving CBNRM and conservation in general through donor funding has a number of disadvantages and is not sustainable: 1) funding cycles are short as donor priorities change and donor fatigue sets in from not seeing the rapid results expected within traditional funding cycles of three to five years, 2) project cycles are often flawed, pumping too much money in at the beginning before it can be absorbed, 3) the wildlife agency or community is subject to the personal preferences and values of the donor “take my money and

²³¹ The World Bank, 1818 H Street, N.W., Washington, DC 20433 U.S.A., Tel: (202) 473-1000, Fax: (202) 477-6391, <http://www.worldbank.org/>

you dance to my music”, which with regards to wildlife may be anti-culling/game cropping, and even anti-utilization in general, especially trophy hunting, and 4) donors are cumbersome and bureaucratic, cannot make quick decisions and are rarely innovative. With many donor projects, most of the money is government to government, never reaches people on the ground where management takes place and is absorbed in salaries, per diems, air-conditioned land cruisers and overheads by NGOs and governments or recycled back to the country of origin through its consulting firms, experts and NGOs, stimulating the donor’s economy more than Africa’s (see Chapter 11, Section 11.7, FOREIGN AID IN GENERAL).

CBNRM appears in many guises, including Integrated Conservation and Development (ICD), Community-Based Conservation (CBC), Community-Based Natural Resource Management (CBNRM), Community Wildlife Management (CWM), Collaborative (or Co-) Management (CM) and Protected Area Outreach Projects (Barrow & Murphree, 1998). Donors brought along their own baggage including decentralization, gender, transparency, democratization (Marks, 2001) and often compliance with IMF/World Bank structural adjustment policies (SAPs) as a prerequisite for donor support.

Donors recognized that African states were unable to centrally manage natural resources and with the re-emergence of democratic aspirations, Western donors began pushing for the devolution of resource rights to peripheral communities living in and around the parks and protected areas (Wilson, 1997 *In:* Marks, 2001). Thus, the stimulus, staffing and concepts did not come from the rural communities, nor were the resources expended directly on these communities, which would have made these programs more community friendly (Metcalfe, 1996 *In:* Marks, 2001).

“The communities were expected to receive projects gratefully as passive recipients to participate in proscribed ‘communities, and to accept benefits in prescribed packages’ ” (Marks, 2001).

In most cases, governments went along for the ride, placing themselves, along with the private sector, as indispensable middlemen between the people and their resources. By the time money filtered through all the interest groups (national and local government, private sector, NGOs), whether its origin came directly from the resource base or indirectly from a donor, little or nothing reached the people.

Beinart (2002 *In: Dovers, Edgecombe & Guest, 2002*) argues that

“Concepts such as community management of natural resources might describe what was done by communities but they are now elaborate frameworks, developed by intellectuals and activists globally, absorbed and adapted by states, and invoked by local communities as part of their political strategy in a new internationally recognized language although in some cases, such as Zimbabwe’s CAMPFIRE program, communities have not necessarily favoured the state’s version of community management,...”

which can be said for most of the “top-down” CBNRM programs. In most cases, as is demonstrated below, the steps towards taking control, let alone ownership, over wildlife have been designed by governments, NGOs and donors to be so complex that they are beyond the capacity of most communities, meaning more “overlords” controlling their every step and keeping them from truly obtaining independent “ownership” of their wildlife and other resources. NGOs, tour and safari operators, national and local governments all get in the way with their own agendas, including their own economic agendas. What the donors call “partners” are actually middlemen/parasites between the community and its resources, sucking up most of the wealth derived from wildlife and other resources. Most

middlemen purport that they “believe” in the tenets of CBNRM and who would not if they were making a killing on the backs of and at the expense of the people who are the rightful owners of the resource: rural communities.

Thus, a big difference between the wildlife “revolution” on the private ranches of Southern Africa and “devolution” to date in communal areas is that the landowner on private ranches pretty much controlled, but most importantly was the direct beneficiary of the daily rates and trophy fees from hunting, unless he/she chose otherwise (sub-contract marketing to safari operator). In the communal areas where CBNRM is practiced, on the other hand, communities were imposed on, dictated to over what resources could be harvested and were required to take on all kinds of middlemen partners (e.g., central and local government, safari/tourism operators and NGOs) to the point that little value accrued to the local level. This is demonstrated in some detail below.

9.5 SUCCESS OF CBNRM BASED ON CONSUMPTION AND COMMODITY PRODUCTION

Success tends to be measured here in economic as opposed to cultural and social terms – how much money can be made from wildlife. CBNRM tends to be market driven (Table 9.1), with trophy hunting being the key source of revenue in Southern Africa, where CBNRM originated.

The experience on private game ranches shows that raising wildlife for hides and venison though eco-friendly provides financial yields no greater than raising livestock, until tourism, both photographic and hunting are brought into the picture. This results in added value on the international market (Child, 1995 *In:* Murphree, 2001 *In:* Baldus, *et al.*, 2001). Tourism (hunting and photographic) is the primary reason for the financial success of CBNRM in Namibia, Botswana, Zimbabwe and Zambia. Like it or not, the majority of the revenue from CBNRM

projects comes from hunting. The implication for household income is broken down in Section 9.7.6.4, CBNRM will not create a “middleclass” in Africa.

Table 9.1: CBNRM tends to be driven by market forces for wildlife

MARKETS FOR WILDLIFE					
	Meat, Hides Products	Sale of Live Animals	Sport Hunting	Eco-Tourism	Mass Tourism
Local	Subsistence Requirements	None	None	None	None
National	Biltong, Venison, Skins and Ivory	Strong Demand From Private Sector for Restocking	Strong Demand From National Sport hunters	Significant Interest in Wilderness Trails and Wild Safaris	Citizens Unlikely to Seek Mass Wildlife Tourism
Regional	Markets Limited by Veterinary Constraints	Strong Demand From Private Sector	Strong Demand From Regional Sport hunters	Growing Market Largely From South Africa	May Develop in Some State Protected Areas
Inter-National	Large Potential Market for Ivory, Rhino Horn, Elephant Hide, Ostrich Products, Crocodile Skins, etc. but Constrained by CITES Treaty. Meat Limited by Veterinary Constraints	Hugh Market For Birds, Reptiles, Fish and Amphibians in International Pet Trade.	Strong Demand From USA and Europe. Robust Market Less Vulnerable to Political Factors	Rapidly Growing Market but Vulnerable to Political Factors	Already Affecting State Protected Areas. Unlikely to Affect CBNRM. Also Vulnerable to Political Factors

Source: Extracted from IUCN/SASUSG (1997). Reproduced with permission of International Institute for Environment and Development (IIED), www.iied.org.

9.5.1 CAMPFIRE, Zimbabwe

Income to CAMPFIRE (in theory representing rural communities) from 1989-1999 (11 year period) totaled as follows (Bond, 2001a) (Table 9.2):

Table 9.2 CAMPFIRE income (US\$), 1989-1999

Year	Sport Hunting	Tourism	Hides/Ivory	Other	Total
1989- 1999	14,089,789	367,808	937,717	460,814	15,856,128
Percent of Total	83	3	12	2	100

Note: Other includes: Live Animal Sales, Collection of Ostrich and Crocodile Eggs, etc.

Source: Bond (2001a), with permission, WWF.

Khumalo (2005) provides a more up-to-date statistic of US\$ 20,289,784 to CAMPFIRE between 1989 and 2001 over a 13 year period, of which US\$ 18,152,074 came from trophy hunting (Khumalo, 2005) or an annual income of US\$ 1.56 million. In 1998, gross turnover from hunting in Zimbabwe was estimated at US\$ 20.6 million (Bond, 2001a) to US\$ 22.3 million (TRAFFIC, 2001 *In:* Baldus & Cauldwell, 2004; Khumalo, 2005), and US\$ 18.6 million in 1999 (Bond, 2001a). This amounts to a 7 - 8.4% of the gross turnover for the community depending on the gross.

In 1999, income from sport hunting to CAMPFIRE dropped to 70%, primarily due to the sale of ivory allowed under the Convention on International Trade in Endangered Species (CITES). If 1999 statistics are thrown out, sport hunting made up 91.5% of the total revenue to CAMPFIRE (Bond, 2001a; (Khumalo, 2005), 90% being the figure often referred to as the contribution from hunting. In 1995, Zimbabwe set a CITES quota of 300 elephants, 150 to CAMPFIRE and 150 to national parks who have state-owned safari hunting areas. Trophy hunted

elephant/year brought in 60% of the revenue that accrued to CAMPFIRE (SCI African Chapter, 1996). Since the political turmoil and radical land reform beginning around 2000/1, there is no way this level of income can be maintained.

9.5.2 ADMADE, Zambia

Similarly, 90% of money from the Administrative Management Design for Game Management Areas (ADMADE) of Zambia comes from hunting (IUCN/SASUSG, 1997). In theory, the ADMADE revenue stream flow is as follows (SCI African Chapter, 1996):

License Fees and Game Animal Fees:

- 50% to government; and
- 50% to revolving fund for NPWS capital replacement of vehicles and other disposable supplies.

Concession Fees - 100% Retained by Revolving Fund

- 40% to management of GMA; salaries of scouts, fuel, vehicle maintenance, rations, camp renovation;
- 35% to community development;
- 10% to national park management; and
- 15% non-self sufficient GMAs.

Promulgated in 2002 and implemented in 2003 with the re-opening of hunting after a two-year hiatus (Hunting was closed for two and a half years, re-opening in mid-2003), distribution of income to both the Zambia Wildlife Authority (ZAWA) and the local community appears as follows (Simwanza, 2006a; Simwanza, *pers. comm.*):

- **Animal Fees²³²**

- 5% to chief (if there is more than one chiefdom in the hunting area this amount is shared among the chiefs);
- 10% to central government (this money is retained by ZAWA);
- 40% to ZAWA; and
- 45% to Community Resource Boards (CRBs).
 - 45% to wildlife management (e.g., supporting community game scouts);
 - 20% to administration; and
 - 35% to socio-economic development.

- **Concession Fees**

- 5% to the chief;
- 15% to the Community; and
- 80% to ZAWA.

The ZAWA Commercial Director, indicates a similar distribution, except that ZAWA keeps 35% of the trophy fees (animal fees) and 15% goes to treasury (Mashinga, 2006; Pavay, 2006). According to Simwanza (*pers. comm.*), ZAWA retains this income (15%) to date. No analyses exist to quantify and compare actual revenue reaching the community under the old and new systems.

Lewis and Alpert (1997), estimated that the trophy hunting in Zambia grossed US\$ 3.1 million of which 5% went to booking agents, 10-15% to professional hunters, and 30% or about US\$ 1.3 million/year to the revolving fund (government). Faddy (*pers. comm.* 1999 *In:* African Advisory Board, 2000a)

²³² Hunting licenses no longer exist (Simwanza, 2006b). “Booking slips” have replaced hunting licenses in which harvested trophy animals are recorded for eventual payment (Simwanza, *pers. comm.*). There are also export permits and veterinary permits, it being unclear if these go to ZAWA or other government departments, and how this money is distributed (Simwanza, 2006c). This needs further investigation.

estimates that out of a gross turnover of US\$ 12 million/year, US\$ 700,000 (5.8% of gross) went to the communities. ZAWA (1999) and Lindsey, Roulet and Romanach (2006) indicate a total accumulated revenue contributing to the national economy of US\$ 5 million. It is unclear if this is gross turnover (total revenue brought in by safari operators) or the income going to the Zambian government from safari operators, resident (from within GMA) and non-resident hunters (citizens usually from the city), that is eventually split between government and rural communities. Simwanza (2005a) explains that the annual budget of ZAWA is about US\$ 5 million and by this rationale suspects that this is what the industry is worth. If one looks at confidential EU data in Section 9.8.5.1, (ADMADE) for 2001 ZAWA data, this for the most part agrees with Simwanza (2005a) as far as a gross government budget for ZAWA with about US\$ 3.1 million/year of the government budget coming from the safari industry. Likewise in 2005, out of a gross income to ZAWA of Kwacha 44,124,000,000 (\approx US\$ 10 million) the amount of 13,771,000,000 (\approx US\$ 3.1 million) came from hunting license and concession fees (Hamilton, Tembo, Sinyenga, Bandyopadhyay, Pope, Guillon, Muwele, Simasiku & Pavay, 2007). If based on Section 9.7.6.5, (Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders), about 26% of the gross goes to government, then the gross turnover value of safari hunting in Zambia would be about US\$ 13 million, very close to Faddy's (*pers. comm.*) estimate.

Based on an analysis of data from DeGeorges (1992a), it can be determined that under the old ADMADE Revolving Fund system, between 3.7 and 4.4% of the gross turnover went to the communities, but of this only between 1.7 and 2.0% went directly for community development, the rest going to local management (e.g., paying salaries of community game guards, etc.) respectively for Grade A²³³

²³³ Gross for Average Grade A Hunting Block [(US\$ 800/Day x 252 days = 201,600) + (18 Clients x US\$ 4,000/Client = 72,000 Trophy Fees + (US\$ 1,000/week Concession Fees x 36 weeks = US\$ 36,000) = US\$ 309,600 under old ADMADE Revolving Fund System.

versus Grade B²³⁴ hunting blocks (see Section 9.6.1.1, Zambia).²³⁵ Thus, based on the gross turnover of US\$ 12 million given by Faddy, this would amount to US\$ 204,000 – 240,000/year for community development in the late 1990s for about 22 GMAs (at that time) or US\$ 9,272-10,909/year/hunting block (GMA). Faddy (*pers. comm.* In: African Advisory Board, 2000) estimates that US\$ 700,000/year went to rural communities. However, if only 35% of this goes for true community development, the actual amount going to the community would be on the order of US\$ 245,000, coming to similar figures from two different directions.

9.5.3 Cullman Hurt Community Wildlife Project, Tanzania

It is estimated that hunting in Tanzania grosses from US\$ 27-39 million/year depending on the data employed, an increase from a gross turnover of US\$ 4.6 million in 1988 and US\$ 13.9 million in 1992 (Baldus & Cauldwell, 2004). Of this, the Wildlife Division makes from US\$ 10 million/year (Baldus & Cauldwell, 2004) to US\$ 12 million/year (Kibonde, *pers. comm.*): 60% from trophy fees, 10% from the annual block fee/concession, 20% from the conservation fee, 7% from the hunting permit fee and 3% from the trophy handling fee (Baldus & Cauldwell, 2004). Income per unit area for all hunting areas of Tanzania is US\$

Percent of Gross to Communities from Average Grade A Block (35% + 40% of concession fees) = US\$ 13,500/309,600 = 4.4% under old ADMADE Revolving Fund System.

Percent of Gross for Community Development from Average Grade A Block (35% of concession fees) = US\$ 6,300/309,600 = 2.0% under old ADMADE Revolving Fund System. Note: US\$ 13,500 and US\$ 6,300 actual average figures (Mwima, 1991 In: DeGeorges, 1992a).

²³⁴Gross for Average Grade B Hunting Block: [(US\$ 700/Day x 168 days = 117,600) + (US\$ 12 Clients x US\$ 4,000/Client in Trophy Fees = US\$ 48,000) + US\$ 500/Week Concession Fee x 24 Weeks = US\$ 12,000)] = US\$ 177,600 under old ADMADE Revolving Fund System.

Percent of Gross to Communities From Average Grade B Block (35% + 40% of concession fees) = US\$ 6,602/US\$ 177,600 = 3.7% under old ADMADE Revolving Fund System.

Percent of Gross for Community Development from Average Grade B Block (35% of concession fees) = US\$ 3,081/US\$ 177,600 = 1.7% under old ADMADE Revolving Fund System. Note: US\$ 6,602 and US\$ 3,081 actual average figures (Mwima, 1991 In: DeGeorges, 1992a).

²³⁵ Note: Actual concession fees to government/community paid by overseas hunters = US\$ 150/week classic 2 week safari and \$US 70/week mini 7-day safari. The difference kept by safari operator. Implies more weeks than used in average Grade A/B block to achieve actual community figures in Mwima (1991 In: DeGeorges, 1992a) meaning percentages could be even lower.

40/km² and in the Selous Game Reserve (SGR) US\$ 70/km² (Baldus & Cauldwell, 2004).

The Cullman Hurt Community Wildlife Project exists in the hunting blocks of Robin Hurt Safaris and was started by Mr. Hurt to make up for a void in government policy in sharing benefits with local communities as a means for them to become partners in conservation. All of the money for community development in the Cullman Hurt Community Wildlife Project, amounting to US\$ 650,000 between 1991 and 2000, is the result of a 20% surcharge on all trophy fees. Another US\$ 250,000/year is generated from an annual art auction used to fund anti-poaching and reward community game scouts for bringing in poachers and their hunting implements (Clarke, 2001). While the 20% surcharge is an excellent idea and should be sustainable as long as hunting continues, Clarke (2001) was concerned about the sustainability of the anti-poaching program, which relied on one man, Robin Hurt, and his contacts with a few “rich and famous” donors. Robin Hurt (*pers. comm.*) continually struggles to raise money. He believes that until wildlife belongs to Africa’s rural communities and until these communities receive all of the trophy fees (at a minimum) so that they can employ their own anti-poaching teams, the conservation of wildlife will suffer. Mr. Hurt believes that what he is doing is not sustainable and may not be replicable by other safari operators who do not have wealthy clients. In correspondence from Sally Capper (2003), she explains, “I am sad to say that I am leaving Cullman Hurt, due to lack of finances. We need to look at new ways to keep things going without a fulltime project director”. Joe Cullman, the driving force behind the art auctions, has just passed away (Jackson, *pers. comm.*), increasing the concerns raised above.

Even with the new policy (instituted in 1993), the “25% retention fund” from hunting go to local government (district council) and Hurt (*pers. comm.*) believes

that local communities will never see this money. Zacharia and Kaihula (2001 *In:* Baldus, *et al.*, 2001) and Junge (2004) came to similar conclusions. The so-called “25% retention fund” consists of 25% of 75% of the game/trophy fees, hunting block fees and professional hunter fees that go to the treasury, except in the Selous with a retention scheme where it is even less (Kibonde, 2004) (see Section 9.5.7, Selous Conservation Program (SCP), Tanzania):

Where there is no retention scheme the following fees are charged

1. Game fees, block fees and professional hunters’ fees:

- 25% Tanzania Wildlife Protection Fund (Fund used for budgetary operations by the Wildlife Division in addition to money from the Treasury and donors, World Bank, 2005); and
- 75% Treasury:
 - a. 40% retained by treasury;
 - b. 35% Wildlife Division; and
 - c. 25% district councils = “25% retention fund”

2. Permit fees, conservation fees, observer fees:

- 100% Tanzania Wildlife Protection Fund.

3. Trophy handling fees:

- 100% Tanzania Wildlife Protection Fund.

The fact that most of the “25% retention fund” do not reach the village, but are used at district headquarters level, fosters distrust among the rural populations. Communities feel that they are being cheated and that the benefits of wildlife utilization are reserved only for the elite government bureaucrats and for

foreigners (Nshala, 1999; Barrow, Gichohi, & Infield, 2000). The possibility of overcoming this with the creation of wildlife management authorities (WMAs) will be discussed. However, the foreign donor driven Local Government Reform Program (LGRP) raises concern over a serious lack of national ownership and how far government is willing to devolve authority and control over natural resources and other issues. GTZ, DFID, Frankfurt Zoological Society, USAID, NORAD, SIDA and other donors are supporting 80% of the total funding of CBNRM programs in Tanzania, which also puts into question the long-term sustainability of such programs. However risky, such reforms are necessary to find a solution to a “failed Tanzanian centralized state” (Junge, 2004).

9.5.4 *Tchuma Tchato*, Mozambique

Tchuma Tchato means “our wealth” (Fabricius, *et al.*, 2001). Just about all of the community benefits in Mozambique’s *Tchuma Tchato* Project come from trophy hunting, with a small portion coming from fishing licenses. Between US\$ 11,000 and 17,500/year are paid to communities; this makes up 34% of the annual trophy plus 34% of the license fees (Nimpuno, 2003). This is not a countrywide program as of yet, being confined to one hunting block along the southwest corner of the Cahora Bassa Reservoir linked to *Safaris de Mocambique* run by Piet Hougaard.²³⁶

9.5.5 Botswana Community Trust Program

Botswana’s hunting industry has a gross turnover of from US\$ 12.5 million/year (BWMA, 2001) (see analysis below in Section 9.6.3.4, Botswana Community

²³⁶ Piet Hougaard, Safari Operator, *Safaris de Mocambique*, *Tchuma Tchato* Community Project. mozamsaf@zol.co.zw. Hougaard sold this company in 2005 to a South Africa based company, “Destination 16 Degrees South”, Geoff Dean, P.O. Box 86, Hilton, 3245, South Africa, geoff@sleepyhollow.co.za.

Trust Program) to US\$ 15 million/year (TRAFFIC, 2001 *In: Baldus & Cauldwell, 2004*) to a high of US\$ 20 million/year (African Advisory Board, 2000a). Five Botswana “community multi-purpose areas” around the Okavango Delta and Chobe Game Reserve generate income from both hunting and eco-tourism. The revenue generated by hunting companies for these five communities in Botswana for 1999 was US\$ 1,696,272.00 (includes land rental, quota, wages, meat contributions, business grants, funeral assistance) (Peake, 1999 *In: African Advisory Board, 2000a*). It has been extremely difficult to obtain a breakdown of revenue to the communities from hunting versus eco-tourism or a breakdown at the level of each individual community. This results in the community receiving 8.5-13.6% of the gross turnover from the safari industry.

9.5.6 LIFE, Namibia, Nyae Nyae Conservancy

Namibia’s overseas trophy hunting is mostly on white-owned farms and was valued at US\$ 4.7 million in 1998 (African Advisory Board, 2000a) to US\$ 5 million (TRAFFIC, 2001 *In: Baldus & Cauldwell, 2004*). However, in 1998, the gross turnover of wildlife production and utilization in Namibia was US\$ 42 million (African Advisory Board, 2000a) from a combination of trophy hunting, live sales, game meat sales and biltong hunting, mostly on white farms, though increasingly in community conservancies. There also was/is some taxidermy.

The Living in a Finite Environment (LIFE) Project of Namibia, funded by USAID, started in the early 1990s to help create community conservancies run through the World Wildlife Fund (WWF) U.S. in collaboration with the Namibian Ministry of Environment and Tourism (MET) (see Section 9.6.3.5, LIFE, Namibia, Nyae Nyae Conservancy). Jones (1999a) provides an excellent historical overview of the process leading to the establishment of the LIFE Project. The Nyae Nyae Conservancy, a communal conservancy, obtains 100% of the conservancy’s income from trophy hunting. Additional money is made by

individuals from craft sales and running a campsite. Conservancy earnings were to be divided between membership (65%) to purchase livestock to boost food, meat and milk production, as well as to contribute to common property benefits from improvement in schools and water infrastructure to agriculture, and 35% to conservancy operations. This data was not broken down at the household level. Direct cash handouts have not always happened (Berger, 2003). Between 1998 and 2002 (five years), a total of US\$ 242,073 (\$N 1,694,511) was earned by the conservancy or an average of US\$ 48,414.5/year (Berger, 2003).

9.5.7 Selous Conservation Program (SCP), Tanzania

The 48,000 km² Selous Game Reserve (SGR) covering 5% of Tanzania's surface area (Baldus & Siege, 2002) was established in 1922. The history of the Selous and other similar reserves and parks, established during the colonial era and its impacts on local people, is described in Chapter 3, Section 3.6, THE END OF COLONIALISM AND THE ACCELERATION IN PHYSICAL SEPARATION OF AFRICANS FROM THEIR RESOURCES. The Selous Game Reserve consists of 44 hunting blocks with no core protected area (Baldus, Kibonde & Siege, 2003), while in 2006 there are 43 hunting blocks and four photographic safari areas (Kibonde, *pers. comm.*). This dispels the myth that wildlife in large numbers over vast areas can only survive in areas of complete protection, namely national parks.²³⁷ The Selous Game Reserve represents 35% of the hunting by clients and by value in Tanzania, which in 2001 was 480 clients averaging 15 days/safari in the Selous (Baldus & Cauldwell, 2004).

²³⁷ 47,500 km² subdivided into 47 blocks in eight administrative sectors; 43 blocks leased to hunting companies and four blocks (B1, K1, Y1 and Z1) reserved for non-consumptive photographic safaris (Baldus & Cauldwell, 2004).

“The Selous Conservation Program (SCP) was established in 1988 as a response to the destruction of wildlife during the later 1970s and early 1980s. It is a bilateral program between the governments of Tanzania (Department of Wildlife) and Germany. Its objectives are to safeguard the existence and ecological integrity of the Selous Game Reserve (SGR) as a conservation area, and to reduce significantly conflicts between the reserve and local populations by implementing village wildlife management and utilization on a sustainable basis (Baldus, 1991; Krischke & Lyamuya, 1991, *In: Gillingham, 1998* *In: Barrow, et al., 2000*). The project operates primarily as a conservation initiative, not a rural development program. It aims to encourage the direct involvement of rural people in wildlife management and conservation by offering tangible wildlife-related benefits (Baldus, 1991, Krischke & Lyamuya, 1991 *In: Gillingham, 1998* *In: Barrow, et al., 2000*). Buffer zones have been established around the reserve for the sustainable use and conservation of wildlife by local people. These buffer zones are located on agriculturally marginal lands which are unsuitable for cattle keeping due to tsetse fly (GTZ & Department of Wildlife, 1994 *In: Gillingham, 1998* *In: Barrow, et al., 2000*). The project works with 41 villages in five districts” (Gillingham, 1998 *In: Barrow, et al., 2000*).

Hahn and Kaggi (2001 *In: Baldus, et al., 2001*) indicate that this program has expanded to 57 villages, while the Wildlife Division (2003) indicates that 51 of 85 villages around the Selous are involved. Kaggi (2002) indicates that 57 out of 90 potential villages are participating.

The Selous Game Reserve (SGR) in Tanzania has increased its income from eco-tourism in the last ten years. Tourism has increased 15-fold over the last 15 years (six tourist camps in the northern sector of the reserve). Tourism contributes 10% to overall income and 20% of the “Selous 50% retention fund” income. Twenty hunting companies in 44 hunting blocks account for 90% of the income and 80% of the retention fund income (Baldus, *et al.*, 2003). Income is distributed as followed (Kibonde, 2004):

Where there is a retention scheme [in Selous Game Reserve (SGR)], the following fees are charged:

4. Game fees, block fees and professional hunters' fees:

- 50% Selous Game Reserve (SGR);
- 25% Tanzania Wildlife Protection Fund; and
- 25% Treasury.
 - a. 40% retained by treasury;
 - b. 35% Wildlife Division; and
 - c. 25% district councils = “25% retention fund”

5. Permit fees, conservation fees, observer fees:

- 50% Selous Game Reserve (SGR); and
- 50% Tanzania Wildlife Protection Fund supposed to run all tourist hunting (sport hunting) areas

6. Trophy handling fees:

- 100% Tanzania Wildlife Protection Fund.

- A part of the income from safari hunting is annually transferred to the respective district councils. Since the introduction of the retention scheme (1993), Selous Game Reserve (SGR) can retain 50% of its income for management. This “Selous 50% retention fund” consists of 50% of the game/trophy fees, hunting block fees and professional hunters’ fees and

50% of the permit, conservation and observer fees (Kibonde, *pers. comm.*; Kibonde, 2004). One third (33%) (e.g., US\$ 500,000) of this annual budget of about US\$ 1.5-2 million is spent outside the game reserve on 1) construction and maintenance of roads increasing transport of cash crops to markets, 2) improvement of communal facilities such as secondary schools, dispensaries and milling machines and 3) salaries of government scouts who stimulate the local economy with improved purchasing power (Hahn & Kaggi, 2001 *In:* Baldus, *et al.*, 2001). This money does not reach households other than through local game scouts. However, according to Baldus, *et al.* (2003), 11% of the “Selous 50% retention fund”/year is used for rural development outside of the game reserve, which from 1999-2002, a period of four years, amounted to US\$ 890,000 or US\$ 222,500/year out of an annual retention fund budget of US\$ 1.5-2 million. In 2003/04, the amount given to communities for development projects was 11% of an annual Selous budget of about US\$ 2 million or about US\$ 220,000/year (Kibonde, *pers. comm.*). It appears that US\$ 220,000/year is the most accurate figure. In 2005, with the end of GTZ support for the Selous, the government has drastically reduced its budget, no longer honoring the “Selous 50% retention fund” (Kibonde, *pers comm.*);²³⁸

- In 2001, another US\$ 41,327/year was obtained by 57 villages from the sale of wildlife meat, income from resident sport hunters, voluntary contributions from safari operators and concession fees from photographic tour operators (Hahn & Kaggi, 2001 *In:* Baldus, *et al.*, 2001); and
- Additionally, there is the “25% retention fund” (25% of 25% of game, block and professional hunter fees that go to the treasury). In the 1999/2000 season, this amounted to US\$ 150,000. This mostly goes to

²³⁸ Unfortunately after the Selous Conservation Program (SCP) ended in 2003 with a retention of US\$ 2.7 million, the retention amount was cut by more than 50% in the following year and to less than US\$ 1 million in 2005/06 (Baldus, 2005a *In:* Baldus, 2005b). The government obviously has other priorities.

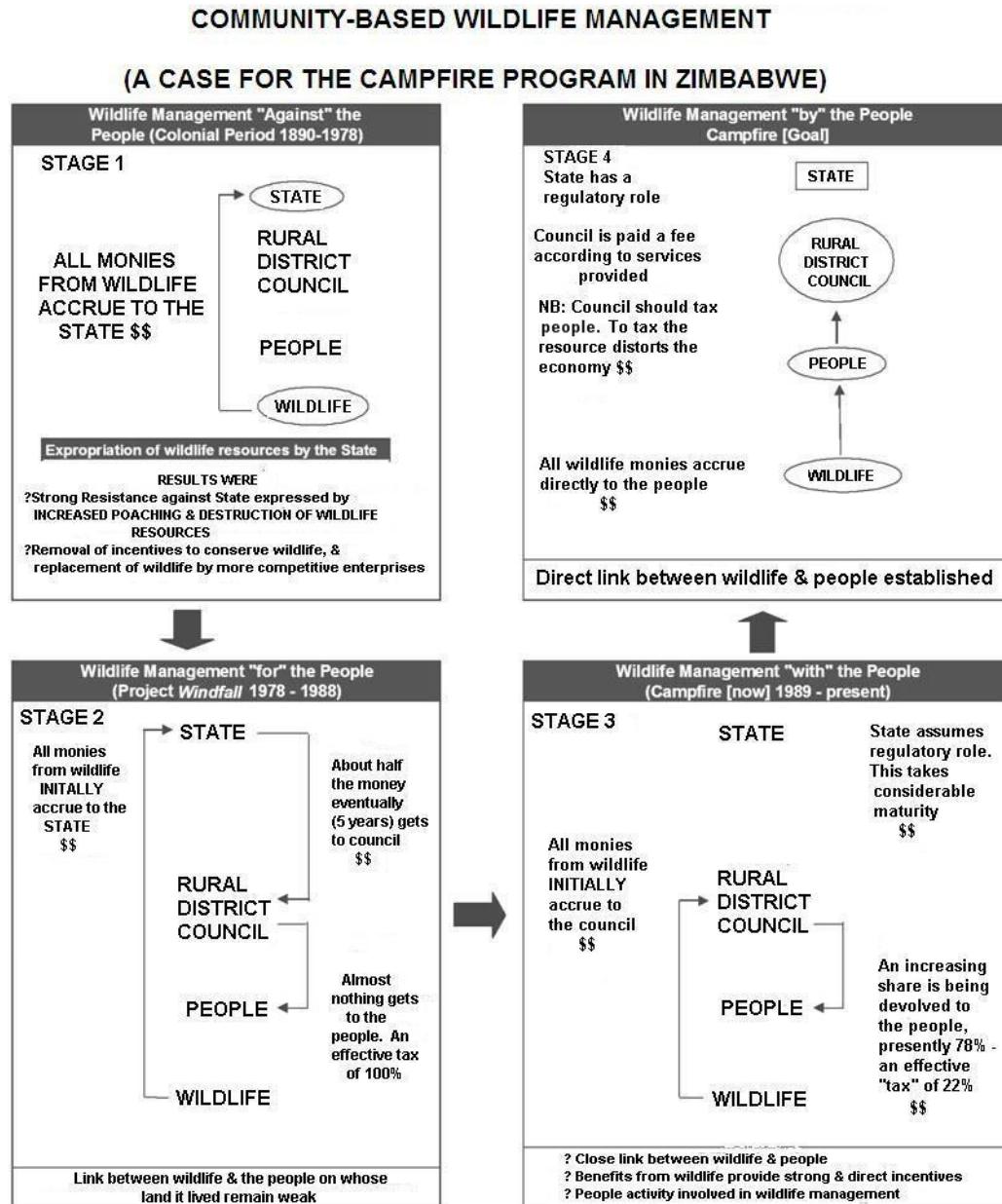
Rural District Councils (RDCs) and is rarely seen by the community let alone the household (Hahn & Kaggi, 2001; Siege, 2001a; 2001b all *In: Baldus, et al.*, 2001).

Therefore, in theory this amounted to a total of about US\$ 411,327 for community benefits in 2001.

9.6 EVOLUTION OF CBNRM IN AFRICA

The attached chart (Figure 9.1) shows the evolutionary stages in the devolution of authority in the CAMPFIRE process.

Though dates may differ, this is the evolution through which most of the older CBNRM programs have passed or are passing. Some newer programs have bypassed a given step as they learn from mistakes made in the older programs. However, most CBNRM programs are stuck in Stage 3, “Wildlife Management With the People”, and are held up in attempting to reach Stage 4, “Wildlife Management by the People” by a lack of trained people from the community to operate and manage the complex institutional arrangements, businesses and wildlife/resources at this stage and a reluctance by government to “let the resource go” for both philosophical and monetary reasons. Attaining resource and land tenure will be critical to communities reaching this final stage of devolution.



Source: Rigava, Norman & Champion, Chinhoyi 1997 Zimbabwe Trust

Source: Rigava & Chinhoyi (1997), with permission, WWF.

Figure 9.1: Stages towards devolution, community-based natural resource management (CBNRM), CAMPFIRE, Zimbabwe

9.6.1 Conservation/Wildlife Management against the People, Stage 1

As discussed in Chapter 3, the conservation policy of colonialism tended to expropriate large tracts of land from rural people for the establishment of protected areas, in addition to removing rural people's control and ownership over their wildlife and other natural resources, often to consolidate, usurp and monopolize the ivory trade from Africans. All money from wildlife went directly to the state. This disenfranchisement alienated Africans from their resources, their land, and the links to their ancestors and the spirit world. Most refused to accept this imposed dispossession, forcing them into accessing the resources clandestinely through "poaching". This made centralized management based on repression, "anti-poaching", an impossible task for the limited manpower and budgets of game departments.

This turned wildlife from a "common property" resource managed at a local level to an "open access" resource belonging to everyone, but being the responsibility of no one but the state, which was incapable of controlling access by its alienated people. Africans began mining wildlife as a short-term resource in favor of long-term investments in other economic sectors over which they had control, such as farming and livestock. Of course other factors also came into play such as 1) the human population explosion of the 20th century, 2) the corresponding increase in and cultural ties to livestock and 3) the soil characteristics of savanna environments, which require long periods of time and large areas of fallow for each hectare under cultivation, a practice that is disappearing (see Chapter 5) under the wave of humanity sweeping across the continent and moving the exploding population onto marginal agricultural land, which is often critical wildlife habitat. The net result, encroachment on and conversion of key wildlife habitat by this wave of human poverty, must be considered the main threat to wildlife in the 21st century – not poaching!

9.6.1.1 Zambia

Things did not necessarily improve for rural Africans after independence from colonial governments, with many nations continuing with colonial policies and centralized control of natural resources. Zambia is a fine example of “Wildlife Management Against the People”, which has been well documented.

“Immediately after independence in 1964, Kenneth Kaunda began to make radio broadcasts and public speeches about the need to protect wildlife. The wildlife bill of 1968 closely followed colonial laws, while conferring even more authority over wildlife by central government. By 1971, 8 statutory instruments were declared that detailed laws regarding trophies, hunting licenses, protected animals, and legal hunting methods. In the same year Kaunda also signed an order creating 32 Game Management Areas (GMAs), and his minister made a motion to the National Assembly to declare a system of 18 national parks within Zambia. Rural Africans were allowed to hunt, but the methods of hunting, where they could hunt, and the requirement of a license resulted in a system that legally excluded most Zambians from using wildlife (still the case in 2007)...As in the colonial era, one way for rural Africans to express their discontent with the loss of land to protected areas, and the loss of hunting rights, was to poach...Even though Kaunda favored strict enforcement of game laws, the UNIP (United National Independence Party) government that had come into power under the rights of locals to hunt, did not make enforcement of game laws a priority” (Gibson, 1999).

Threatened by increased strength of opposition parties, by 1972 Kaunda declared a one-party state, concentrating power in the office of the president. Wildlife came under increasing pressure with even less law enforcement than under a multiparty state (Gibson, 1999).

Under the new electoral rules, members of parliament were more responsible to their constituency than under multiparty rule. Local officials and local party backing was required if a candidate wished to gain support in the primary

elections and in the general elections candidates were elected by the local voters who began to expect that their member of parliament would support their demands. Constituents frequently voted out parliamentarians who failed to deliver local benefits. During the same time frame, a dramatic fall in copper prices by 1975 led to government policies causing inflation. Maize previously accounted for over 70% of marketed agricultural production. Government decreased producer prices of maize, favoring the urban consumer, which resulted in a 50% decline in maize production from 1975-84, forcing many households to cease producing for the market. Smallholder incomes declined by 58% from 1974-83. Urban incomes also declined. Civil servants, representing 67% of the formal sector employment, saw price increases outpace government wage increases (Gibson, 1999).

At the same time, rural Zambians detested wildlife laws, believing that they had a right to hunt and that safari hunting, not hunting for the pot, endangered wildlife populations. They saw the only beneficiaries from game laws and reserves/parks as white tourists, white hunters, white lodge owners and government, all at the expense of the rural population. A growing international demand for wildlife products, from petrodollars increasing incomes in many Asian/Middle East countries, resulted in increasing demand and value on ivory and rhino horn. Decreased domestic incomes increased the domestic game meat market. Significant budget cuts in the Game Department (National Parks and Wildlife Service - NPWS) resulted in decreased manpower and operational means to enforce wildlife laws and conduct anti-poaching campaigns. Only the contributions of the white dominated Wildlife Conservation Society (WCS) of Zambia, safari companies, Save the Rhino Trust and Honorary Rangers sustained anti-poaching efforts (Gibson, 1999). The pressure on wildlife at all levels began to increase:

- Foreign exchange (FOREX) was badly needed to pay off debts and pay for imported products; and
- Rural areas that had depended on remittances from family working in the mines began to rely more on wildlife as a source of food.

The net result was a wave of poaching across the country. Ivory prices increased six times between the early 1970s and late 80s. It is estimated that by the mid-1980s, elephant populations were reduced by about 75% from about 100,000 to between 15,000-25,000, the majority of the population and thus reduction being in the Luangwa Valley (African Advisory Board, 2000b) (see Chapter 5, Section 3.7.3, Open Access Resources among the Valley Bisa). During all of this time, ivory and rhino horn were legally marketed items. By the early 1980s, licenses for hunting elephant and rhino were stopped to protect the legal slaughter of these animals for the international horn and ivory market. The illegal slaughter only accelerated. Things got completely out of control, until most of the rhino and elephant in Zambia were exterminated. The international ban on ivory in the early 1990s provided a short-term stopgap to protect elephant (SCI African Chapter, 1996) (Table 9.3):

Table 9.3 Elephant declines, Luangwa Valley		
YEAR	ELEPHANT NUMBERS	SOURCE
1973	100,000	Caughley & Goddard (1975)
1978	45,000	
1983	25,000	
1990	15,000	Child & Clayton (2002)

Source: DeGeorges *In: SCI African Chapter (1996)*.

Elephant are beginning to recover with current estimates at over 25,000 (Faddy, *pers. comm.*, *In: African Advisory Board, 2000b*).

The exact change in the black rhino population over time is difficult to determine due to conflicting numbers given by various surveys. There were most probably

about 2,000 rhinos in Zambia, with estimates ranging from 1,000 to 7,000 (Faddy, *pers. comm.* In: SCI African Chapter, 1996). What is known is that the black rhino is almost gone, though remnant individuals have been recorded in the dissected and difficult to traverse area south of the South Luangwa National Park (Faddy, *pers. comm.* In: SCI African Chapter, 1996). Child and Clayton (2002) estimate that by the mid-1980s there were less than 100 in the Luangwa Valley.

Uncontrolled hunting areas (open for non-resident hunters²³⁹) were rapidly depleted of game. Likewise, there has been a gradual deterioration of wildlife in GMAs (Game Management Areas). Rural residents, military and police, businessmen and politicians all joined in this free-for-all. Even game department officials were implicated (Potgieter, 1995).

By 1995, there were only four Grade A hunting blocks out of 22 GMAs, which still offered superlative quality big game hunting, including lion, leopard and buffalo (Table 9.4). GMAs cover an area of about 150,000 km² (ZAWA, 1999). It is said that these areas are in their present state, due to protection and good management practices by the better safari operators (SCI African Chapter, 1996).

As indicated below, a number of hunting blocks changed categories between 1992 and 1996, in a downward direction. ZAWA (1999) calculated that

“the current use of trophy animals to sustain the safari industry is limited to 19 hunting blocks, of which 14 account for 90% of the total income”.

Closure of hunting between 2001 and mid-2003 exacerbated this problem.

²³⁹ A resident hunter is someone usually living within the GMA as opposed to non-resident citizen hunters living outside the GMA, often in town.

Table 9.4: Prime hunting blocks, Zambia in 1995

GAME MANAGEMENT AREAS (GMAs)			
<u>Grade A</u>	<u>Grade B</u>	<u>Grade C</u>	<u>Depleted</u>
Nyampala	Chanjuzi	Bilili/Nkala	West Zambezi Upper
Sichifulo	Lower Luano	Busanga	Lunga Luswishi
Luawato	Chifunda	Mumbwa East	
Mulobezi	Kasonso	West Petuake	
	Mumbwa West	Rufunsa	
	Mwanya	Sandwe	
	Lower Lupande	West Zambezi Lower	
		Upper Lupande	
		West Musalangu	

Note: Grade A: best blocks descending to Depleted being worst block with regard to game populations.

Source: DeGeorges *In: SCI African Chapter (1996).*

Note: Lumimba divided into Chanjuzi (north) and Mwayna (south), Munyamadzi = Nyampala, Lupande divided into: Upper and Lower Lupande, Mumbwa divided into East and West Mumbwa, West Zambezi divided into Upper and Lower West Zambezi Game Management Areas (GMAs). In 2005, the following blocks have been subdivided: Mulobezi, Lunga Luswishi, Lower Lupande, Nkala/Bbilili comprised of two GMAs now split to be Nkala and Bbilili, Chikwa/Fulaza (Simwanza, 2005b.)

Note: In 2006 ranked as Prime, Secondary, Understocked and Depleted (Manning, 2006), as well as Specialized where any of the three species lechwe, sitatunga and tsessebe are restricted in their distribution. Manning (2006) states that “it is likely that many of Zambia’s hunting blocks require downgrading”.

9.6.1.2 Kifluku Farm, Laikipia, Kenya

See Chapter 11, Section 11.11.9.2, Impact of donor driven conservation on private lands for a detailed discussion of Clive and George Aggate of Kifluku Farm, Laikipia Kenya.

Although there are similarities, there are also major differences between Kenya and Tanzania, which have resulted in wildlife living under more favorable conditions in Tanzania – at least until now (see Chapter 3):

1. In both Kenya and Tanzania, prior to the 1890s, tsetse fly/wildlife habitat had been pushed back to the point that it only made up about 33% of Tanzania's landmass – no specific data for Kenya;
2. In both countries, a series of catastrophes resulted in a major die-off of people and livestock, allowing wildlife and the bush to come back starting in the 1890s;
3. In both cases, people were compressed to make way for European settlers, parks and hunting blocks;
4. Human population densities were somewhat lower in Tanzania and failed tsetse fly eradication schemes and both colonial and post-independence *Ujama'a* village schemes concentrated people, allowing tsetse fly to spread along with the wildlife;
5. A big difference was that the Tanzanian government retained ownership of the land and wildlife and that it was in its economic self-interest to see wildlife and related habitat survive;
6. In 1977, the World Bank forced the closure of hunting in Kenya, taking away the value of game reserves to government. It is believed that many were turned into parks and others into group ranches;
7. Kenya gave ownership of the habitat to the people - based on a World Bank encouraged group ranching scheme, which it could be argued impoverished the Maasai as it cut off transhumance and sedentarized them - giving local communities ownership of the land but not ownership over the wildlife. Thus, the people opted out of wildlife except in Laikipia and Machakos, where white Kenyans with a different vision of the landscape saw wildlife as a key component along with a few privately black owned cooperative ranches. Minimal use of wildlife has been allowed (e.g., some

game cropping, commercial bird shooting for sport, eco-tourism) of insignificant consequence to landowners; and

8. However, today in Tanzania, human populations and poverty are increasing. Simanjiro is a good example of a key wildlife area disappearing under small-scale farmers, as land is leased to commercial farms and the “politics of despair” emerges as people return from the hopeless cities and begin poaching, charcoal making, farming and honey collecting, while their cattle are over-grazing - whatever it takes to survive (see Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”).

East Africa has among the fastest growing human populations in the world at 3.5%/year (Roe, *et al.*, 2000). Population increases between 1950 and 2000 alone in East Africa took on the following dimensions (for detail see Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY):

HUMAN POPULATION			
Country/Area	1950	2000	Times Increase/% Annual Growth Rate
Kenya	6,121,184	29,985,839	4.9/3.2
Tanzania	7,934,924	33,065,142	4.2/2.9
Uganda	5,521,758	23,248,553	4.2/2.9

Source: USBC (2004) with permission USBC + public domain.

Thus, with increasing population pressures, the proposed community run Wildlife Management Areas (WMAs) in Tanzania (see Section 9.6.3.6, SCP Program), if they become a reality and result in true devolution, will basically mean ownership of the land and wildlife by the communities, as opposed to decentralization where government still retains control. This may be the long-term hope for the survival of wildlife and its habitat in Tanzania. Returning full ownership of wildlife to landowners in Kenya may stop the current rapid extinction of wildlife/habitat

across the country outside of parks and private/cooperative ranches of Laikipia and Machakos.

9.6.1.3 Manyeleti Game Reserve, South Africa

The area comprising the 22,750 ha “Big 5” Manyeleti Game Reserve, among other property, was originally demarcated as white farms lasting over the period from about 1869 to the late 1950s/early 1960s when the land was purchased by the Apartheid government’s South African Development Trust to create black homelands. The original inhabitants, who made a living from hunting, were forced into becoming farm workers on the white farms. A portion of this land was set aside as a “black game reserve” run by the Gazankulu homeland government and called Manyeleti, the “place of the stars”. With the change in governments in 1994 and in accordance with the constitution, the land was transferred to the current custodian, the Northern (now Limpopo) Province government (Mahoney & van Zyl, 2001). Peripheral communities on the western boundary of the Manyeleti Game Reserve won a 2002 land claim over the reserve. Situated on the western boundary of the Manyeleti Game Reserve are eight rural communities within two tribal authority (TA) areas - seven in the Mnisi TA area and one in the Machangana TA area. Manyeleti is bordered on its eastern boundary by the Kruger National Park, on the south by the Sabi Sand Game Reserve and on the north by the Timbavati Game Reserve. It is still managed by the Limpopo Parks and Tourism Department, with little say by local communities over how the reserve and the resources are to be used. The reserve to date is primarily for foreign tourists staying in private lodges. In 2001, there were three concession areas and 74 beds, which were marketed to primarily European tourists. A total of 60-70% of the beds were filled per night (mid-luxury) at between US\$ 92-132²⁴⁰ (Rand 700 – 1,000)/night/person, all-inclusive (Mahoney

²⁴⁰ FXConverter – 164 Currency Converter, www.oanda.com/convert/classic

& van Zyl, 2001). In 2005, the Tintswalo Safari Lodge charged between US\$ 754-1,062 (Rand 4,900-6,900)/person/night depending on the accommodation and the season.²⁴¹

Even as facilities improve, local livelihoods appear to be little impacted by such development. A 2005 survey based on 330 questionnaires of which 50 were distributed to adults in Dixie village, 80 in Hlavekisa village, 60 in Gottenberg village and 140 in Welverdiend village, found that: 1) the majority of the people interviewed wanted to be involved in running development activities in the reserve, 2) the majority saw the reserve as a place where African wildlife was kept for the benefit of the rich, 3) they wanted access to various natural resources within the reserve and 4) regardless of age or education there was no statistical difference with the majority of people believing that poaching in the reserve was a result of poverty and hunger. The student researcher was dissuaded by the Kruger National Park socio-ecologist from quantifying economic benefits to the community due to the issue's political sensitivity (Masango, 2005).

Can natural areas in South Africa, or for that matter across the subcontinent, survive if rural people are alienated from the rural landscapes being imposed on them by an urban majority? On one hand, the urban majority, desiring to escape from the concrete jungles of the big cities, perceives nature as a pristine environment, untouched by human hands, a nirvana bathed in warmth and beauty. On the other, rural impoverished subsistence-living communities perceive a need to live from the resources contained in these natural systems and are alienated from urban perceptions and desires of rural landscapes imposed on them. This is resulting in a clash of cultures and livelihoods across Sub-Saharan Africa, as the urban world, controlling both wealth and politics, wants exclusion zones.

²⁴¹ http://www.krugerpark.org/Premier_Safari_Lodges-travel/pricing_manyeleti-safari-tintswalo-lodge.html

However, in creating these areas, they are placing themselves in direct conflict with rural livelihoods and in the long run are jeopardizing biodiversity by forcing rural people to poach since legal access is not possible. As discussed, once clandestine access to resources occurs, their sustainable management becomes difficult and they will likely be mined for short-term gain out of anger, frustration and the need to survive, with the ultimate result being habitat and resource degradation; a loss to both local communities and to the world's urban majority. Rather than being lose/lose, the situation could be win/win by integrating the needs of both groups into these areas.

9.6.2 Conservation/Wildlife Management for the People, Stage 2

Due to concern about the increasing deterioration of the African environment, governments passed legislation creating conservation and extension agencies. The situation did not improve as the governments did not have the capacity to enforce what they determined (imposed) were good environmental practices for Africa's real natural resource managers, the millions of small-scale farmers and pastoralists (Murphree, 2001 *In: Baldus, et al.*, 2001). In fact, in many instances, the practices imposed on rural Africans further deteriorated the environment (see Chapters 3-8). By now, the governments in desperation decided that some benefits from wildlife should be shared with local communities in an attempt to co-opt them into Western ideas of conservation being put forth by the newly independent governments.

9.6.2.1 Operation Windfall, Zimbabwe

In the precursor to CAMPFIRE, “Operation Windfall”, (Wildlife Industries New Development For All) 1978-88 (Figure 9.1), money from wildlife went directly to the state, took five years to get down to local government (district councils), while

almost nothing got to the people; in effect a 100% tax was levied against producer communities (Rigava & Chinoyi, 1997).

9.6.2.2 ADMADE, Zambia

“An important workshop held in 1993 in the Luangwa Valley (The Lupande Development Workshop) resulted in a Presidential Directive that led to the creation of the Administrative Management Design for Game Management Areas (ADMADE) and the Luangwa Integrated Development Project (LIRD). In the same year Zambia provided policy support for CWM (CBNRM) through its Policy for Wildlife in Zambia, which established an administrative and financial framework for the further development of the ADMADE program” (IUCN/SASUSG, 1997).

ADMADE is a "bastard child" lying between this and the next stage.

“The ADMADE program was a counter by NPWS (National Parks and Wildlife Service – now Zambia Wildlife Authority (ZAWA) to the LIRD (Luangwa Integrated Resource Development Project funded by Norwegian Agency for International Development (NORAD) – a Western Donor) program to increase NPWS control over wildlife, while shielding these efforts from political interference. It was established in 1987. The main goals were 1) increase the department’s revenue and shield it from government control, 2) Increase the number of NPWS staff through employment of community wildlife scouts, and 3) Create popular support for ADMADE” (Gibson 1999).

In essence, Dzingirai (2004) argues that throughout much of CBNRM until today, the state has used the CBNRM concept across Sub-Saharan Africa to create

“physical infrastructure such as game guards, anti poaching units, purchase of vehicle, all aimed at further restricting local access to local resources while strengthening the state and private business’ renewed grip on them” (Dzingirai, 2003; Munro, 1998; Schroeder, 1999 all *In:* Dzingirai, 2004).

All ADMADE revenue went through the wildlife department's "revolving fund", from which it was not only hard for the Wildlife Management Sub-Authorities (WMSAs) to obtain money, but for which the European Union (EU) believed +/- US\$ 1 million to be unaccounted for in 1994/95 (SCI African Chapter, 1996). There was a complete lack of transparency, the fund never having had an external audit. USAID believes that many of the funds destined for communities were diverted for administrative purposes (SCI African Chapter, 1996) or worse into the pockets of the bureaucratic elites. This appears to be a continuing problem with the disbursement of these funds being held up because of "institutional problems" (Nyambe & Nkhata, 2001 *In:* Johnson, 2004 *In:* Fabricius *et al.*, 2004). When money did make it down to the WMSA, most of it was used to the benefit of the chief, his village and a few technicians (e.g. teachers and nurses) handpicked by the chief to do his bidding (DeGeorges, 1992a). The "modern chief" no longer represented his people but himself! The chief used income from ADMADE to maintain his power, consolidating his links with powerful outsiders, and to develop local patron client relationships (Marks, 2005 *In:* Lyman & Child, 2005). The central role of traditional authority (chiefs) in decision-making and revenue distribution is being challenged (IUCN/SASUSG, 1997) and as is seen in this case study is being addressed with attempts at creating more democratic institutions. Chiefs from the WMSAs sat on a NPWS technical committee and recommended the selection of preferred concessionaires. These recommendations were ignored, as safari operators were chosen by the NPWS. There were many scandals and eventually court cases regarding the former that may have helped shut down hunting from 2001-mid 2003 (Section 9.8.5.1, ADMADE). With an overly-centralized one-party state, NPWS was used to create employment through a patronage system to family members, but also patronage and kickbacks linked to the awarding of hunting blocks (Child, McKean, Kiss, Munthali, Jones, Mtsambiwa, Castley, Patton Magome, Pangeti, Fearnhead, Johnson & Chilikusha 2004 *In:* Child, B., 2004a), which during the Chiluba era was largely controlled

by the Indian business community who were rewarded for supporting the President and his government. This ultimately led to what Bond, *et al.* (2004 *In:* Child, B. 2004a) identified as a “political and bureaucratic leadership in collusion with a closed and uncompetitive private sector”.

Government game cropping to feed the villages never met its annual quota and rarely got to outlying villages other than the chief's, with most of the meat being sold off in urban centers (DeGeorges, 1992a; Marks, 2005 *In:* Lyman & Child, 2005). Traditional hunters, their needs and possible role in wildlife management, have been systematically ignored by government and Dale Lewis, who was sponsored by USAID through WCS²⁴² (DeGeorges, 1992a). The principal author remembers, during this evaluation, a woman running up to the vehicle with a bowl of dried mice, mice outbreaks in Zambia and Malawi providing a major source of protein, even being sold along the roadside in Malawi, with four to five roasted mice on skewers. She said,

“This is all we have to eat. The government cropping program is getting nothing to the outlying villages” (DeGeorges, 1992a).

9.6.3 Conservation/Wildlife Management with the People, Stage 3

This strategy became known as “community participation”. This is where we are **today**, with most CBNRM programs such as CAMPFIRE in Zimbabwe, Botswana Community Trust Program, the Selous Conservation Program (SCP) in Tanzania, etc. This strategy recognizes the power of Africa's rural peoples to shape the continent's environmental future. It recognizes traditional knowledge, “indigenous technical knowledge” (Murphree 2001 *In:* Baldus, *et al.*, 2001), but rarely uses this knowledge in making management decisions. It recognizes rural Africa's cultural, spiritual and ancestral ties to the land, wildlife and other

²⁴² Wildlife Conservation Society of the New York Zoological Society

resources, but generally fails to integrate these needs into the management of the areas, opting for material rewards to change attitudes.

The successes of this strategy, to date, are isolated, externally initiated and heavily subsidized by the outside world. The broad CBNRM picture in Sub-Saharan Africa remains one where successes stand as islands in a sea of initiatives, where performance rarely matches promise and is sometimes abysmal (Murphree, 2001 *In: Baldus, et al.*, 2001). The lack of generalized advance in stemming negative trends in Africa's environmental status has unleashed disillusionment for CBNRM.

These programs are mostly top-down with minimal input from the "producer communities", the villages that co-exist with wildlife.

9.6.3.1 CAMPFIRE, Zimbabwe

In the 1960s, Zimbabwe experienced a radical shift in policy over wildlife from protectionism to conservation through sustainable use. The concept of game ranching took hold and with the advent of the safari industry in the 1960s, wildlife began having a comparative/competitive economic advantage on white owned ranches over other land uses (e.g., cattle). This led to the 1975 Parks and Wildlife Act, which "confers privileges on owners or occupiers of alienated land as custodians of wildlife, fish and plants". "Owners or occupiers of alienated land" were designated "appropriate authorities" over wildlife, effectively making farms and ranches into proprietorial wildlife units, combining "ownership", management, cost and benefit. Then in 1982, the government amended the Parks and Wildlife Act, allowing the minister to appoint a rural district council "to be the appropriate authority for such area of Communal Land as may be specified".

This amendment, in theory, eliminated discrimination between farmers on private lands and communal land farmers. The 1989 wildlife policy went on to say

“outside the Parks and Wildlife Estate, government views wildlife as a resource capable of complementing domestic livestock and will favor neither one above the other in the development of the country. It will rather allow economic processes to determine the outcome of competition”. (Government of Zimbabwe, 1989:7 *In:* Murphree, 1997).

The statement asserts what Aldo Leopold said 60 years ago,

“Game management is a form of agriculture”, (Leopold, 1933 *In:* Murphree, 1997).

Thus, the groundwork for CAMPFIRE was laid out.

The average armchair conservationist waves the CAMPFIRE banner saying “power to the rural people”, supposing that CAMPFIRE represents the rural citizens of Zimbabwe with links to wildlife. However, this is the farthest from the truth. Certainly, this has been the case with the sport hunting community, who have supported the philosophical concept of wildlife benefiting people, but who have rarely delved into what CAMPFIRE is and what CAMPFIRE does for rural people and their attitudes towards wildlife. The CAMPFIRE Association is an umbrella body of Rural District Councils (RDCs) (local government) given appropriate authority over wildlife since communities are not legal entities (Child, 1995).

Post-independence amendments to the District Councils Act and the Rural District Councils (RDCs) Act of 1988 allowed Rural District Councils (RDCs) to lease land and utilize natural resources on behalf of their communal land constituencies.

The sub-structures of RDCs as set up after independence are as follows (Child, 1995; Murphree, 1997):

- At the lowest tier are the Village Development Committees (VIDCOs) comprised of about 100-150 households or 1,000 people. Each village is represented by an elected VIDCO, with the VIDCO chairperson representing the village at the ward level; and
- The next tier is the Ward Development Committee (WADCO), comprised of VIDCOs. There are up to six to ten villages represented at a ward level. Each WADCO elects a councilor to the RDC, which may also have councilors elected from commercial farm areas within the district. The size of each council will vary according to the district's population, but generally fall within the range of 12-28 councilors.

VIDCOs and WADCOs were imposed and often did not follow traditionally established boundaries of territory and membership. VIDCOs and WADCOs are essentially planning and administrative units. They do not have legal rights to ownership or exploitation of land and resources and can only act in this capacity as delegated units of RDCs. RDCs often preside over areas, which are highly heterogeneous in population densities and resource endowments (Murphree, 1997).

By 1996, there were 56 RDCs of which 26 had appropriate authority and were designated as CAMPFIRE areas, while 13 had trophy hunting as a major focus (SCI Africa Chapter, 1996). Those CAMPFIRE areas where trophy hunting is important tend to be peripheral to a national park or another natural area that serves as a core protected area to produce wildlife, the overflow of game being hunted in the CAMPFIRE area (Sparrow, *pers comm.*; Cumming, 2004 *In:* Child, B., 2004a). Cumming (2004 *In:* Child, B., 2004a) explains that this is also

true for the community Game Management Areas (GMAs) of Zambia, hunting blocks in northern Cameroon, and the Wildlife Management Areas (WMAs) and Controlled Hunting Areas (CHAs) of Botswana.

Wildlife may not be so much conserved in the communal areas as harvested when populations of wildlife wander out of parks, some providing income such as elephant, lion and buffalo from trophy hunting, while others such as antelope may be taken for meat by local hunters or as trophies by overseas hunters. Conservation thus does not take place directly on the communal land which tends to be over-populated with people, but in the core area or just adjacent to it on a small portion of the communal land with approval of local community members – the core area serving as a protected area where wildlife can reproduce and populations can grow. In essence, these complexes function as an IUCN biosphere reserve: a core protected area with multiple use peripheral areas.

The Department of Wildlife and National Parks under the Ministry of Environment and Tourism retains ultimate authority over wildlife if it is misused. The CAMPFIRE Association is an umbrella body of RDCs consisting of a board of 13 people with a chairman and a first and second vice president. An association “Chief Executive Officer” has been hired as a staff member, along with support staff. Wildlife management committees exist at the level of the RDCs, wards (representing up to ten villages) and villages. Service providers (NGOs) include the:

- World Wildlife Fund (WWF) Zimbabwe, which assists with wildlife monitoring and quota setting;
- Zimbabwe Trust (ZIMTRUST) assisting with capacity building; and
- African Resources Trust (ART) (ART, 2002) assisting with international lobbying.

Murphree (1997) believes that the biggest weakness of CAMPFIRE is the RDCs rather, than producer communities, at the ward level having legal control over wildlife.

“It perpetuates the legal discrimination between access rights to wildlife accorded to farmers in the commercial sector and those accorded to communal land farmers. Finally, by placing devolution at the discretion of councils, it has led to the wide variation in the Program's degree of success as councils have responded to their commitment in different ways” (Murphree, 1997).

Hasler (1999) raises the above as a major design flaw in CAMPFIRE.

In many instances, the RDCs have failed to distribute benefits from wildlife to a lower level. Thus in many cases, the “decentralization” of CAMPFIRE has become the “recentralization” of a district-level elite. The result has been ignorance of or hostility to the CAMPFIRE program, mistrust of the councils concerned, increasing intolerance of wildlife in localities and a continued lack of communal environmental controls (Murphree, 1997). District councils depend on and therefore intercept the revenues from CAMPFIRE, further reducing the already minimal impact that these revenues can have (Koch, 2004 *In: Fabricius, et al.*, 2004).

“What we had, and continue to have therefore, was not genuine involvement but rather a decentralization of despotism” (Dzingirai, 2004).

Sibanda (2004 *In:* Fabricius, *et al.*, 2004) also believes that the distribution of benefits is often inequitable since the policy of giving income and other benefits to the villages (ward) where the animal is killed during the hunting season (May–October) may not take into account the people in rainy season dispersal areas (November–April) who must also tolerate the same wildlife. They are often far removed from the hunting block, may have had to tolerate crop raiding by that animal, but receive no compensation.

Junge (2004) believes that this failure in full devolution to producer communities is a major reason why land uses in many CAMPFIRE areas are incompatible with wildlife (e.g., in-migration, extension of cropping and increased livestock numbers).

As stated earlier and as is restated a number of times, CAMPFIRE, as originally structured, and many similar CBNRM programs in Africa, while generating common property benefits generally fail to improve household livelihoods. Murombedzi (1994 *In:* Murphree, 1997) suggests that

“under small-holder agricultural conditions prevailing in communal lands cattle are a main form of household accumulation and that unless CAMPFIRE revenues at household levels are at levels sufficient to off-set the perceived loss of the accumulative potential of livestock the Program is likely to encounter opposition at these levels. His research suggests that this opposition is likely to be particularly strong in wealthier households”.

CAMPFIRE was meant to be a dynamic process with eventual negotiated devolution of authority over wildlife to the producer community (Murphree, 1997). It was an “African solution to African problems”. CAMPFIRE was designed so that money generated from wildlife, 90% through hunting (60% from trophy hunted elephants), would go back into uplifting rural communities living

among the wildlife in return for their cooperation in protecting wildlife and its critical habitat (Child, 1995; SCI African Chapter, 1996). However,

“since 1995 CAMPFIRE has been viewed as a ‘middle-aged’ social movement – missing out the crucial stage of adulthood. It is at this stage where many of the flaws of the program could, and should, have been ironed out – i.e. mechanisms should have been developed to ensure the devolution of ownership to the ward and village level, thereby breathing life into the ‘community-based’ part of the program. Instead the state, at its various levels, retained control and ownership, and District Councils remain the seat of ‘Appropriate Authority’ over wildlife” (Hasler, 1999 *In: Roe & Jack, 2001*).

9.6.3.2 *Tchuma Tchato*, Mozambique

Prior to the imposition of safari hunting on the Bawa community of Tete Province, traditional de facto management was adequate, guided by the spirit mediums as intermediaries especially to *Sekwati*, the spirit of the land, and the lion spirit.

Safaris de Mocambique, a private hunting concern, started operating in what is known as “Block 1” in 1989 during the Mozambican civil war and was immediately confronted with uncontrolled commercial poaching that devastated the game populations (Edwards, 1994). The hunting block is in the southwest corner of the Cahora Bassa Reservoir, virtually cut off from Mozambique by water on the north and east, and bounded on the west by Zimbabwean hunting blocks. This is the only hunting block where the community conservation program *Tchuma Tchato*, “our wealth”, takes place and at the time was the only hunting block in Mozambique with a CBNRM program.

Namanha and Abacar (1993) from the Mozambican game department in interviews with villagers state that the latter saw themselves as having no ownership over wildlife, saw poaching as a way of earning money and viewed wildlife as a pest. Namanha and Abacar (1993) also state that the ivory ban had contributed to increased poaching as the illegal demand increased and recommended the practice of trophy hunting of elephant, as was taking place in CAMPFIRE schemes across the border, to the Mozambican government.

Similarly, Edwards (1994) decided that the only hope of deterring poaching was a management plan with benefits to the local people. In 1994, the *Tchuma Tchato* started as the first CBNRM project in Mozambique, relying on its next-door neighbor Zimbabwe's CAMPFIRE experience. The project was supported by the Ford Foundation,²⁴³ but jointly managed by IUCN-Rosa (Regional Office, Southern Africa) in Harare and the National Forestry and Wildlife Directorate (DNFFB) in Maputo. Later on, fund management was relocated to the Provincial Direction of Agriculture and its CBNRM unit. Since 1994, Ford spent almost US\$ 1.8 million on the project through seven different grants. Most grants were given directly to the unit created within the provincial government for CBNRM (Nimpuno, 2003)

The donor funded *Tchuma Tchato* program centralized de jure (legal) control over wildlife and other resources, resulting in “aborted devolution” undermining a functioning traditional and local management system that had previously assured sustainable levels of resource use (Johnson, 2004 *In: Fabricius, et al., 2004*). The *Tchuma Tchato* program was designed to and used by government as a vehicle for institutionalizing capacity within the bureaucracy, resulting in increased state and local bureaucratic intervention. However, it was presented to the community as a

²⁴³ Ford Foundation, Southern Africa, P.O. Box 30953, Braamfontein 2017, Johannesburg, South Africa, Tel: 27-11-276-1200, Ford-johannesburg@Fordfound.org, www.Fordfound.org/global/office.index.cfm?office=Johannesburg

means of resolving conflict and empowering the community's control over safari hunting operations. Although the community was to be aided in the formation of a community-based management institution to which the state would devolve certain levels of authority to manage natural resources, this never happened. (Johnson, 2004 *In: Fabricius, et al.*, 2004).

The government and safari operator marginalized the community with regards to traditional control and access to resources in the area. The safari operator, rather than negotiate controlled access by the community, used his empowerment by government to exclude and alienate the local people from the area through repression. Much of the support for this program that increasingly marginalized the local community through centralization was funded by the Ford Foundation, which by 2001 was pulling out, leaving the expensive government conservation unit on the verge of collapse (Johnson, 2004 *In: Fabricius, et al.*, 2004).

The safari operator first paid his fees to government. Money was then distributed directly to the producer community (village), which is considered a level of government. The village determined how to spend these benefits from hunting (Nimpuno, 2003). However, by 2001, rather than funding individual communities, the money was handled centrally by a common commission representing the entire area (Nimpuno, 2003). This appears to be a step in the wrong direction desired in the devolution of authority. Villagers have little say with regards to their selection of a private sector partner, setting quotas (both safari, and traditional of which there are none), etc., all of which are controlled by the government. They are however involved in anti-poaching. As in most "top-down" narrowly focused CBNRM programs, where local needs are not integrated into the management plan, especially traditional hunting, how successful can anti-poaching be? One has to wonder how effective these community game guards are in arresting their relatives who have no legal right to hunt?

Ultimately, according to Johnson (2004 *In: Fabricius, et al., 2004*), the community's perception of the *Tchuma Tchato* program became negative for a number of reasons: 1) revenue streams were diverted by government conservation agents for both law enforcement and for conservation agent lodging, 2) the Mozambican government, as all over Africa, taxes the wildlife resources by retaining significant amounts of trophy and concession fees and 3) the government empowered the safari operator to use repression, as well as to undertake anti-poaching without first negotiating access by the community into the area for various resources, including wildlife. Community game guards that supposedly represented community management and control were brought under control of government and ordered to enforce laws against their fellow community members resulting in division and dissent. Poaching increased and the government wildlife post built on a hill near Bawa village, while first being seen as a sign of development, had come to be seen as a sign of repressive and uncalled for state intervention (Mugabe & Murphree, 2000 *In: Johnson, 2004 In: Fabricius, et al., 2004*).

9.6.3.3 Cullman Hurt Community Wildlife Project, Tanzania

Robin Hurt was ahead of his time in Tanzania, starting this program in the early 1990s before most people were even thinking of implicating rural communities in conservation in East Africa. This began under his first safari company, which he sold, now known as Tanzania Game Trackers (TGT)/Wengert Windrose Safaris, which has continued his ideas under the Friedkin Conservation Fund.²⁴⁴

Under Hurt's current company, Robin Hurt Safaris, the Cullman Hurt Community Wildlife Project, is very top-down with money being controlled by a project staff.

²⁴⁴ A community conservation fund linked to the safari companies of Tanzania Game Trackers and Wengert-Windrose Safaris, Arusha, Tanzania named after the owner of these two companies, an American based out of Texas, also info@legendaryadventure.com and www.legendaryadventures.com

Village committees, elected by popular vote determine how to spend their share of the money, with funds being spent, after informing local government, either through purchase of materials and/or employment of local workers under contract. A disadvantage of this is that the communities do not learn fiscal responsibility. On the other hand, this avoids mismanagement and corruption so typical of many CBNRM programs. Robin Hurt (*pers. comm.*) does not believe many of these communities are ready to properly manage money, lacking trained bookkeepers and accountants. He may very well be right, given the current level of training and education of most community members/staff at this time, and the history of fund mismanagement in other CBNRM programs (e.g., ADMADE, Botswana Trust and CAMPFIRE)!

9.6.3.4 Botswana Community Trust Program

The Botswana approach combines rights to obtain quotas and hunting licenses from the Department of Wildlife and National Parks (DWNP) with rights to obtain leases over land for commercial purposes from land boards. The Policy on Wildlife Conservation of 1986 called for the greater involvement of local people in wildlife management and utilization, and for rural people to gain greater benefits from wildlife use, but does not say how this will be achieved.

“The Wildlife, Conservation and National Parks Act of 1992 provides for the declaration of Wildlife Management Areas (WMAs) and Controlled Hunting Areas (CHAs) and provides for permission for wildlife use on communal land to be given by Tribal Land Boards. The Tribal Land Act of 1968 enables Tribal Land Boards to give out leases for commercial purposes. Policy directives, such as the SAVINGRAM (a Botswana Government term for an internal memo) on community tourism and hunting development, provide for leases over hunting and tourism to be given to communities who form a representative legal entity. Rights are dependent upon designation of an area as a community hunting area otherwise the lease is negotiated between the Land Board and the private sector directly. District level government

agencies play a significant role in the process of a community negotiating its joint venture. According to the Joint Venture Guidelines, communities have to wait for endorsement of the joint venture approach by the District Development Committee. The District Council is assigned a role in negotiating with the private sector on behalf of the community. The Joint Venture Guidelines make it clear that: 'Wildlife remains the property of the State, and although wildlife management is to be decentralized, wildlife utilization and any form of off-take will be subject to the DWNP's decisions regarding the quota for each area' (IUCN/SASUSG, 1997)".

Jones (1999a) provides a detailed background of history and legislation leading to the Botswana Community Trust Program.

The legal entity referred to above was the trust. In the Botswana Community Trust Program, a very strict set of rules was established by the Ministry of Trade and Industry (Peake, 2001): 1) decisions as to which "community areas" would be allocated to which villages were made in advance by the government, though generally villages within or close to each area were selected, 2) the community-based organization (CBO) had to be in the form of a representative and accountable legal entity for the community living in or near the Wildlife Management Areas (WMAs) in question; a "trust" registered with the registrar of societies, 3) to create a trust, each group of villages set up an interim management committee selected at a *kgotla* (village meeting), in the presence of district level officials of DWNP and the district land board, 4) once the community registered its trust, the trust was given a 15-year lease²⁴⁵ of the controlled hunting area (CHA) by the land authority for a nominal rental and the trust was allocated an off-take quota by DWNP, 5) the trust could enter into contract with commercial operators for these purposes through a tender process or it could use the resources for subsistence purposes and 6) the first private sector sublease or joint venture

²⁴⁵ Fabricius, *et al.* (2002) indicate a ten year lease

contract was one year only, the second for one year, the third for three years and the rest for five years with renewal options. At the end of each contract, the trust had the option to renew the contract with the private sector or to go out to tender again.

As WMAs have come up for re-tendering, they have been reclassified as multiple use areas. Those turned over to community trusts were reclassified as Community Management Areas (CMAs) (SCI African Chapter, 1996):

- Five community managed wildlife utilization in livestock areas; and
- Six community managed wildlife utilization areas (community multi-purpose areas and community photographic areas).

The first community trust was in the Chobe enclave in 1994, comprising five villages. Such community trusts have stronger legal proprietorship than wards in CAMPFIRE (Fabricius, *et al.*, 2001) but as is seen, are far from having achieved full devolution rights by government. There are many overlapping tenure regimes. Government still owns and controls wildlife but as noted above access rights to wildlife and land can be leased from government, while grazing on floodplains outside the buffalo fence (e.g., outside the Moremi Game Reserve/Okavango Delta) is treated as communal property and fishing and veld products are often treated as “open access” (Hasler, 1998 *In:* Fabricius, *et al.*, 2001).

Communities have a very tenuous hold over their control of wildlife at the good will of the government. The president can remove the wildlife management area status protecting wildlife as a land use (IUCN/SASUSG, 1997). As noted and is seen below, the DWNP and even the vice-president can close hunting for various species without a solid biological basis and for what appear to be political

motives. On January 30, 2001 the permanent secretary of the Ministry of Local Government issued a “savingram” that “with immediate effect” all revenues earned by community-based organisations in the country from the use of wildlife and natural resources, should be handed over to district councils. The funds were to be administered by the district councils (local government) on behalf of the communities, “in consultation with the affected communities”. By implication, the funds were also to be shared among other communities elsewhere in each district. The reasons given in the savingram for this directive may be summarized as follows (Bell, 2000):

- Wildlife is a national asset and benefits from it should be shared by the state as a whole and not be confined to the communities living with it. Wildlife is likened to diamonds in this sense;
- The present system, where benefits from wildlife in community areas are allocated to the local community trust, is discriminatory, since any job opportunities resulting are reserved for members of the local community concerned, while others are excluded;
- Funds derived from wildlife under the existing system are misused by the community trusts which are often unable to produce audited accounts; and
- The intention that the funds be used by local communities for community development is not working or is duplicating development efforts on the part of the district councils.

The directive to transfer funds derived from wildlife in the community areas to the district councils was a 180-degree reversal of policy. This attempt has been foiled for the moment. However, it is expected that such “tug of wars” between governments, both local and national, and between government and rural communities, will be part of the evolutionary process of CBNRM over the next ten to 20 years as communities struggle to take back control over their resources, not only in Botswana but also across Sub-Saharan Africa. A fine example is the

struggle by the San (Basarwa) to take back the Central Kalahari Game Reserve (CKGR), which is currently playing out in the Botswana courts (see Chapter 3, Section 3.9.2, Eco-Genocide and the San of the Central Kalahari Game Reserve (CKGR), Botswana).²⁴⁶ Jones and Murphree (2004 *In: Child, B., 2004a*) conclude that since USAID support for the Natural Resources Management Program (NRMP) ended (1989-1999), government has not filled the gap left by the donors, leaving a weak institutional support base for CBNRM. This questions their long-term commitment to CBNRM in Botswana.

Government meddling in community affairs continues. In 2001-2002, the government, which sets quotas, significantly reduced quotas, a decision that was based on politics and not good science.

Under ministerial powers, Clause 64 of the Wildlife Conservation Act, the minister has the power to abolish a species from the hunting quota without notifying anyone. On February 5, 2001, the Minister Of Commerce and industry declared lion hunting closed for one year, without giving any reason. Lion hunting remained closed in 2004 as this was being written. The closure of lion hunting could cost the safari industry, and thus communities, US\$ 1.26 million/year or 10% of the total annual income from hunting (BWMA, 2001). The loss of 24 elephants on quota in two hunting areas, as well as the other animals in these areas, amounts to more than US\$ 1.6 million loss of turnover. When added to the loss due to the closure of lion hunting, the industry will face a reduction of some US\$ 2.86 million, or BWP (Pula) 15.7 million (22.8% of gross turnover) at the 2001 exchange rate (BWMA, 2001). This implies a gross turnover of US\$ 12.5 million/year from safari hunting.

In 2002, hunting was closed for sable, sitatunga and reedbuck (Peake, 2002) and will likely never reopen unless hunting companies support and fund extensive

²⁴⁶ San win case in December 2006

surveys to determine population numbers (Peake, 2006). Leopard, kudu and lechwe quotas were reduced. The only quota remaining static was the elephant quota (Peake, 2002). The reduction in trophy quotas was followed by massive increases in trophy fees and export fees (Myburgh, *pers. comm.*). The Vice President, Ian Khama, appears to be behind much of these closures. He is alleged to be closely allied with individuals within the animal rights movements such as Pieter Kat (a lion researcher) and Derek Joubert (a film maker) with support from the England-based animal rights group Born Free Foundation²⁴⁷ (2002). He is also alleged to have significant shares in the eco-tourism company, Wilderness Safaris, admitting on its website that it is anti-hunting and losing as much as US\$ 300,000/year in revenue from the closure of hunting in its concessions (Wilderness Safaris, 2006), where both hunting and photographic safaris are permitted in the same concession.

In the Okavango Delta of Botswana, 12 lion were on the hunting quota/year²⁴⁸ out of a population of between 1,178 and 1,698 lions in 1999 (Winterbach, Winterbach, Sechele & Kat, 2001).²⁴⁹ According to Paul Funston (2004),

“This was an off-take of about 1% per year. What is true is that the Botswana government’s policy of paid compensation of stock losses due to large carnivore predation had failed, and that regardless of the compensation large numbers of lions were still being killed annually for preying on livestock. Even so it is estimated that Problem Animal Control (PAC) and safari hunting combined were only accounting for 5% of Botswana’s estimated 4000 lions annually, which is probably sustainable at current human densities”.

²⁴⁷ Animal rights group Born Free, FREEPOST RCC1862, Horsham RH13 5BR; 3, Grove House, Foundry Lane, Horsham, West Sussex, RH13 5PL. <http://www.bornfree.org.uk/index.shtml>

²⁴⁸ Only 12 lion/year number in Okavango Delta (Winterbach, *pers comm.* In: SCI Africa Office, 1999).

²⁴⁹ Estimated lion population 1,178-1,698 in 1999 and 1,189-1,668 in 1998 (Winterbach, *et al.*, 2001).

It is obvious that the decision to close lion hunting is a political agenda of Vice President Khama and Western animal rights groups. There certainly has been no consultation with rural communities who will determine the future of lion. Likewise, the decision to stop lion hunting appears to have gone over the heads of the wildlife department.

Rumors abound that if and when Ian Khama becomes president, hunting will be closed in the Okavango Delta and Chobe, these areas being used exclusively for tourism, even though many hunting operations run both safari hunting and eco-tourism with lodges for both on the same concession. This allows maximization of profits from wildlife. What does the future hold for hunting and sustainable use in Botswana? With each year quotas are cut, trophy fees and other taxes go up and it becomes more and more difficult for safari operators to cover their costs and earn a living, while remaining competitive in the market place. Many people see hunting phasing out in the Okavango Delta and Chobe. Some believe that elephant hunting will continue as this gains significant revenue for the communities and there is an over-abundance of elephant in northern Botswana. They believe that in the future, most plains game hunting will take place on game ranches such as those being developed in the Ghanzi and Tuli blocks (Peake, *pers. comm.*). None of this has anything to do with empowering communities to take control over their own resources or destinies. It is top-down and heavily influenced by foreign outside forces. At the end of the day, the local people and wildlife lose.

The Department of Wildlife and National Parks (DWNP) is under the Ministry of Commerce and Industry, and has not supported the decision, recommending a lion quota every year (Winterbach, *pers. comm.*). Christian Winterbach (*pers. comm.*) knows an individual who spoke directly to Khama and was told that although he personally does not like hunting, he understands its role in conservation. While maybe not being the reason for the closure of lion hunting in 2001, Winterbach

(*pers. comm.*) believes that the US\$ 500,000 offered by a wealthy sport hunter and backer of one of the major safari operations to Botswana for lion research over a five year period if they kept lion hunting opened was seen by Khama as an attempt to bribe him and the country. To demonstrate that Khama and his country could not be bought is believed to be the primary reason that Khama over-ruled the game department's recommended lion quota from 2001-2004. Salopek (2001) accuses well-known lion hunter, Steve Chancellor, a backer of Rann Safaris, as well as former President George Bush Sr., former Vice President Dan Quayle and Persian Gulf War hero Gen. Norman Schwarzkopf of pressurizing the government to lift the ban on lion hunting. The exact truth, be it pressure from the animal rights and/or pressure from the hunting community, is likely to be known only to a select few such as Mr. Khama. It should be noted that in 2005, lion hunting re-opened with one lion per major concession area (Causey, 2005) in the Okavango/Chobe area, amounting to 20 lion in total. Safari operators in other parts of the country are complaining. In addition, Problem Animal Control (PAC) of lion in livestock areas has been opened up, these policies being supported by a recent meeting of regional lion researchers over Botswana's lions. However, further analysis at the level of populations/management units was recommended (Funston, *pers. comm.*). Limited lion hunting continued in 2006. In October 2007, lion hunting in Botswana has been closed again until further notice, the reason being given as the large number of PAC lions being killed (van der Merwe, 2007).

9.6.3.5 LIFE, Namibia, Nyae Nyae Conservancy

Historical Setting

Commercial farms and ranches were granted wildlife user rights in 1967, followed by the 1991 policy of the Ministry of Environment and Tourism creating

conservancies on commercial farms and ranches and finally on communal lands as promulgated in the 1996 Nature Conservation Act (Fabricius, *et al.*, 2001).

The LIFE Program is one of the latest CBNRM programs to start up, having the distinct advantage of learning from older CBNRM programs in Southern Africa. It appears to be a fairly bottoms-up program. Institutional constraints, as opposed to government, are at the basis of its frailties.

The Minister Of Environment and Tourism retains regulatory oversight, with the ultimate rights to withdraw conditions or recognition of the communal conservancy. Conservancy legislation confers user rights over wildlife and tourism resources to the community conservancy but not ownership of the land or resources (Hulme & Murphree, 1999 *In:* Fabricius, *et al.*, 2001). One shortcoming is that the current system of communal lands is “open access” in which other groups can move into a conservancy area, settle on the land and use the resources (see Section 6.1.5.2, Decentralization and creation of pastoral associations in West Africa, and Chapter 9, Section 9.7.2.1, Devolution through policy reform, land and resource tenure). A “white paper on land reform”, if passed, will provide community conservancies exclusive tenure and the ability to apply for “ownership” of their land (Fabricius, *et al.*, 2001) (see Chapter 6, Section 6.1.5.2, Decentralization and creation of pastoral associations in West Africa). According to Long (2004), communities through conservancies still have limited rights over wildlife and de jure land rights remain in the hands of central government.

By 2001, the 15 registered communal conservancies managed over 200,000 head of wildlife in 40,000 km², expecting to increase to 49 conservancies and 100,000 people with 34 emerging conservancies covering approximately 60,000 km² (Child, 2005 *In:* Lyman & Child, 2005).

Nyae Nyae

While the Ju|'Hoansi (San) of Naye Naye lost about 90% of their original 90,688 km² (35,000 mi²) during colonialism (Weaver & Skyer, 2003) (see Chapter 3, Section 3.8.1 Land Compression Among the Last Hunters and Gatherers, Ju|'Hoansi of Nyae Nyae, Eastern Bushmanland, Namibia), in 1998, Nyae Nyae was the first communal area in Namibia to be registered as a conservancy with the Ministry of Environment and Tourism (MET). This occurred under legislation passed in 1996, making the Nyae Nyae community a pioneer in the institutionalization of CBNRM in Namibia. Wildlife has been translocated into the area and 14 dedicated water points for game have been established compared to less than five that were operational in the early 1990s (Weaver & Skyer, 2003), most of this coming about from USAID funding with some support from the private sector. The community is involved in wildlife monitoring and in contracting out to a safari operator whom they select.²⁵⁰ It appears that the MET still establishes trophy hunting quotas, as the communities do not have the capacity. To date nothing has been done to address traditional hunting, so poaching continues (Berger, 2003). According to Arnold (*pers. comm.*), traditional hunting is now allowed using traditional weapons (e.g., bow and poisoned arrow, and spears) but not modern firearms. Though it still needs capacity building, there exists a “conservancy management board” consisting of three members each from four districts and a four person management committee and conservancy staff (Berger, 2003). Concerns have been raised by both Berger (2003) and Wiessner (1999:3 *In:* Hitchcock, 2003a) concerning elitism developing between those employed by the conservancy and the unemployed from the community. Disharmony from a small percentage of the community employed by ecotourism is raised as a threat to its sustainability (Watkin, 2007).

²⁵⁰ In most of Africa, government still select private sector with little or no say from rural communities.

9.6.3.6 SCP, Tanzania

The Selous Conservation Program (SCP) is midway with regard to empowering communities. Although the community has been given some responsibilities, full devolution is far from being achieved. About 50% of the money currently made from safari hunting in the Selous is controlled by the SCP of which about 11%-33% of this 50% [see Section 9.5.7, Selous Conservation Program (SCP), Tanzania] is used for community development outside of the reserve such as road maintenance, schools, dispensaries, milling machines, and game scout salaries who come from the area (Hahn & Kaggi, 2001 *In: Baldus, et al., 2001*), but not directly to producer communities. Another 25% of the 25% of game fees, block fees and professional hunters' fees go to local district councils, but as noted, little of this is believed to reach rural communities.

Though accepted by the Wildlife Division, the “*Revised Draft Policy and Management Plan for Tourist Hunting*” has never been implemented (Department of Wildlife, 1995 *In: Baldus & Cauldwell, 2004*). It would solve many of the current shortcomings within the safari industry, such as transparency through tendering, direct negotiation between communities and safari operators, community participation in quota setting and community management of revenue from hunting. It even devised a plan for the sharing of revenue from trophy hunting:

Wildlife Management Areas (WMAs):

- 75% of revenue goes to the local community for management and community development;
- 15% goes to district councils for support of local government wildlife staffs; and
- 10% goes to the Tanzania Wildlife Protection Fund for administration.

Game Reserves:

- 50% goes to game reserve retention to meet management costs;
- 10% goes to the Wildlife Protection Fund for administration;
- 15% goes to the district councils as an opportunity cost of the game reserves; and
- 25% goes to the treasury

The 1998 Wildlife Policy of Tanzania (WPT) transfers management authority over WMAs [some Game Control Areas (GCAs) and all Open Areas] to local communities. The Wildlife Division retains control over hunting in game reserves. WMA guidelines have been established (Wildlife Division, 2003). The WPT defines a WMA as “an area set aside by village governments for the purpose of biological natural resource conservation” (Junge, 2004). However, a new wildlife act must still be passed, revising the Wildlife Conservation Act No. 12 of 1974, so that WMAs can be fully promulgated and rural communities can obtain full user rights (Baldus, Kaggi & Ngoti, 2004; Junge, 2004). The 1997 National Environmental Policy and the 1998 National Forest Policy compliment the WPT in supporting strong decentralization of management of natural resources down to the village level (Junge, 2004).

As of 2001, the SCP was the major area for the development of WMAs, with 51 of 85 villages around the Selous having created “pilot” WMAs. In theory, the Authorized Associations (AAs) – see description below) can authorize (Wildlife Division, 2003):

- Traditional hunting quotas;
- Resident hunting;
- Tourist (overseas) hunting;
- Non-consumptive tourism (photo safaris);

- Live animal capture;
- Tree harvesting;
- Bee resources (honey collection); and
- Fishing.

Mining, game cropping and game farming/ranching are not allowed. A major problem for many local residents is that they cannot afford the hunting license fees, even though they are at below market prices, thus resident hunting becomes reserved primarily for richer urban-dwelling Tanzanians and non-citizen residents (Majamba, 2001).

The pilot WMAs are given an annual meat hunting quota harvested by the villages and sold to the community to raise money for community projects – individuals at household level do not appear to gain income. There is one village contracted to a tourism lodge. Resident sport hunters can pay to hunt though the main revenue from this hunting goes to the district council (Siege, 2001b; Zacharia & Kaihula, 2001). There are pilot schemes where villages set an additional fee (Siege, 2001b).

Until overseas trophy hunting is phased in, it is unlikely that CBNRM will be a significant addition to the household income (Siege, 2001b), but to date the government has not allowed this to happen. According to Kaggi (2004), the main reason is that none of the pilot WMAs are registered and that they have not been allowed to start economic operations.

It appears that the WMA process is slow and tedious: too bureaucratic as opposed to streamlined. There are 12 institutions involved in the management of a WMA depending on its location: 1) Authorized Associations (AAs), 2) village councils, 3) village assembly, 4) district council – local government, 5) district natural

resources advisory body, 6) Wildlife Division of the Ministry of Natural Resources and Tourism (MNRT), 7) Tanzania National Parks (TANAPA), 9) Ngorongoro Conservation Area Authority (NCAA), 10) Tanzania Wildlife Research Institute (TAWIRI)—responsible for the wildlife monitoring unit, 11) NGOs and 12) individual investors (e.g., private sector) (Wildlife Division, 2003).

The AA council consists of three members from each participating village of the proposed WMA and is responsible for managing the WMA and employing game scouts. The AA central committee consists of ten elected members from the AA council, which has executive duties. The AA board consists of five members elected from the AA committee, who act as trustees and enter into agreements with the private sector (Wildlife Division, 2003).

There are seven major steps in creating a WMA: 1) inform villagers, 2) village council (VC) recommends potential WMA area to village assembly (VA),²⁵¹ 3) villagers through village assembly form a registered community-based organization (CBO) with a constitution and “strategic plan”, 4) develop land use management plan approved by village assembly, followed by an environmental assessment (EA) of the plan, 5) draft a general management plan and a resource management zone plan, 6) CBO submits application to director of wildlife through district council, 7) director of wildlife determines if the CBO can be an AA and have a WMA to manage, 8) the director of wildlife forwards his recommendation and application to minister and 9) minister declares area a WMA and issues a certificate of authorization and publishes the AA in the gazette (Wildlife Division, 2003)

At present, the Wildlife Division has not granted any of the “pilot” WMAs authorized association (AA) status and therefore none can go into joint venture

²⁵¹ VC and VA village government institutions with VA consisting of all adults over age 18 and VC consisting of 15-25 elected members of VA

with the private sector for tourist safari hunting. Only one WMA, JUKUMU,²⁵² has managed a joint venture with a tourist lodge (Kaggi, 2004).

“Restricted by the Wildlife Department to an annual hunting quota for bushmeat, JUKUMU can hardly cover its costs for the protection of the area. The Government earns good money from tourist hunting (sport hunting) in Gonabis, but they do not seem to be prepared to share it with the owners of the land. Together with other villages in five districts around the Selous Game Reserve (SGR), all participants of a pilot scheme, JUKUMU is struggling for survival. The Government has not yet finally decided whether it will replace its conservation policy of ‘fences and fines’ with the integration of rural communities into a new, more people-based conservation strategy” (Hahn, 2005 *In:* Baldus, 2005b).

The real money will come when the JUKUMU WMA is fully registered, receiving “wildlife user rights” under the law that allows tendering the hunting and tourism rights in Gonabis estimated at a value of US\$/year of 100,000 to 200,000 to the community. Like most pilot WMAs, the communities know this and their patience is running out (Rustagi, 2005).

Ashley, Mdoe and Reynolds (2002 *In:* LWAG/DFID 2002) state major constraints to the success of the Jukumu Society, including:

- Regulations still not in place to permit local wildlife based businesses;
- Most of time spent meeting WMA policies and not on enterprise development;
- Wildlife being used for communal income and not local economic development, or household level opportunities;

²⁵² Jukumu is an association of 22 villages collectively managing the area of Gonabis covering 250 km² of alluvial floodplain, serving as a dry season grazing area for wildlife from the Selous Game Reserve (Rustagi, 2005).

- Jukumu Society, which will manage WMA, is remote from local government;
- Trophy hunting has large barriers to entry by rural community;
- Selous is a fly-in luxury destination with few opportunities for kiosks, craft centers, cultural shows, etc.;
- Highest tourism/hunting potential inside Selous Game Reserve (SGR) not on community land;
- Far removed from markets for wildlife linked products such as skins and meat; and
- Socialist legacy of Tanzania causes suspicion of individual entrepreneurship.

Will communities be allowed to control tourist safari hunting, since as the income from hunting is spread around, many of the current profits made by the Wildlife Division will accrue to the WMAs, thus giving a smaller slice of the pie to the government? Thus,

“despite the alleged commitment to community involvement and participation through the Wildlife Policy, in practice, the WD (Wildlife Division) has not adhered to its own policy and legal framework...Consequently, the development of WMAs is seriously delayed. There is no progress on development of an effective schedule for sharing of benefits from tourist hunting (sport hunting) with the local communities on whose land hunting takes place. There is a general hesitation among outfitters to accept the WMA concept. It is possible that much of the delay in the development of WMAs is the result of a negative high-level influence by some hunting operators, who reportedly have influence with the Government to block the allocation process” (World Bank, 2005).

DPG (2005) draws similar conclusions with regard to some safari operators refusing to accept the WMA concept.

Safari operators, some of whom have had hunting concessions for up to 25 years, fear change, especially corruption going from central to the local level, plus the potential loss of income if they have to tender for concessions, providing fair market prices to communities and government. Currently, safari operators pay only US\$ 7,500/year/hunting concession as a block fee, the market value of a concession lease after deduction of fixed and movable assets being conservatively US\$ 50,000/year or US\$ 150,000-200,000/5-year lease (Baldus & Cauldwell, 2004). Tendering would force them to increase the share of profits from this and other charges with the communities. Corruption between village leaders and hunting outfitters has occurred in some pilot WMAs; one reason the Wildlife Division has retained full control over the outfitters and their quota allocations (Baldus & Cauldwell, 2004), and a major reason for the need to create transparent processes from accounting to wildlife monitoring.

Some of the larger safari companies such as Robin Hurt Safaris, TGT/WWS and Raul Ramoni's consortium are known to have some community programs mainly providing common property benefits through a trophy top-off fee charged to hunting clients. However, most companies provide

“mere window dressing and are not taken to task as the requirements set by the Wildlife Division are particularly vague in this regard...They prefer a paternalistic approach rather than true empowerment of the communities to manage wildlife” (Baldus & Cauldwell, 2004).

Another reason many safari operators do not wish change is that an estimated US\$ 1 million in interest might be lost in money collected in advance from clients (initial 50% advance payment six to eight months prior to the hunt and the remainder of the daily rate two months prior to the hunt) all of which can be banked and collect interest. Currently, only the US\$ 7,500/year block fee is paid in advance (10% of the payment to the Wildlife Division); 27% being paid on arrival of the client and the purchase of a permit and 63% at the end of the

hunting season, the deadline being April 30th of the following year (e.g. for the season of 2005 beginning in July, final payments due on or before April 30th, 2006) (Baldus & Cauldwell, 2004). Changes in revenue sharing could impact this hidden income of safari operators. Meanwhile the WMA process sits in limbo.

In mid-2007, the safari industry has been thrown into turmoil, with rumors of corruption in both government and the private sector being rift and from Tanzania Government Notice 159 of June 29th 2007 (URT, 2007) passed by parliament that increases block fees to US\$ 40-50,000/year, and trophy fees especially of flagship species such as lion and leopard from US\$ 2,500 to US\$ 12,000, and elephant from US\$ 4,500 to US\$ 15,000 (US\$ 30,000 if bow hunted). These increases occurred after safari operators had marketed and sold their hunts. If these fees are retained, hunting in Tanzania will become even more expensive in possibly the most expensive country in Africa to hunt, with the likelihood that a percentage of these fees will be passed on to the client and a percentage will cut into the safari operator's profit margin. Time will tell if Tanzania can remain competitive in this market niche, and if there are enough wealthy clients willing to pay such fees. Since the Government Notice that would have increased government fees from US\$ 10 million to US\$ 27 million/year, the safari operators have negotiated government fees down to US\$ 18 million/year (Kibonde, *pers. comm.*).

The biggest shortcomings of the WMA process under "The Wildlife Policy of Tanzania" of March 1998 are (Shauri, 1999):

- **State retains ownership of wildlife.** State-centered wildlife conservation is unsympathetic to the needs and concerns of the local people, resulting in a militaristic approach to management, which heightens conflicts. The failure of buffer zone initiatives to engender genuine community participation in wildlife conservation is partly related to the centralized top-down nature of and land use planning in wildlife management;

- **WMA procedures too bureaucratic.** The procedures for creating WMAs are considered too lengthy, leading to unnecessary delays becoming bogged down in various levels of bureaucratic red tape. Until this process is complete, the community has no right to access and benefit from its wildlife;
- **Communities lack technical skills.** The communities also lack technical skills to manage these areas and the wildlife;
- **Lack of political will** by the Wildlife Division to truly empower the communities;
- **National Land Policy**, while recognizing resource tenure conflicts over the haphazard allocation of traditional rangeland for large-scale agriculture and the danger this poses to wildlife, it does not recognize, clarify and secure customary land rights in law; and
- **National Parks Ordinance of 1959** gives the president power to declare national parks, thereby extinguishing customary rights. There is also concern that this policy will be used to further expand state land at the expense of customary land in creating wildlife corridors, dispersal areas and buffer zones – the latest battlefield.

Similarly, LWAG/DFID (2002) states that the complexity, cost and time to become approved as a WMA in Tanzania or a conservancy in Namibia acts as a barrier to entry of communities into taking back and managing their wildlife and other resources. This includes lengthy and detailed financial plans, management plans, land use plans and business plans with five-year budgets and forecasts. Baldus, *et al.* (2004) explain that the regulations are so complicated that one needs to be a “professor” to understand them. They conclude that establishing a WMA is more difficult than requirements for government protected areas including: management plans required of WMAs which most game reserves do not have, environmental impact statements which most roads and game scout

stations in government game reserves do not require a certificate of land not required in the WMA regulations and yet to be given to a single village in the whole of Tanzania. Many private sector operators, let alone less sophisticated rural communities, would have a difficult time providing all these inputs. Baldus, *et al.* (2004) believe that too much bureaucracy slows down the process and discourages target communities. They are concerned that the very cautious “pilot phase” could take decades, in effect creating a moratorium on the creation of new WMAs, while many pilot WMAs have been active for a number of years around the Selous, though none yet have full user rights that can serve as test models.

“Villages have already waited 15 years to see CBC (Community Based Conservation)²⁵³ become a reality in Tanzania. Within such a time span a child is born, is brought up and will nearly have completed its education. How far have the WMA ‘children’ developed in those years? Has the mother allowed them to take off their nappies? Has the father allowed them to use their abilities and earn money for themselves” (Baldus, *et al.*, 2004).

LWAG/DFID (2002) recommended streamlining these processes. Unless rural communities can make full use of and gain maximum benefits from their wildlife resources, CBNRM risks failing in Tanzania (Junge, 2002). Similarly, across the spectrum, de la Harpe, *et al.*, (2004 *In:* Child, 2004a) conclude for CBNRM in general that “a common example is the requirement for communities to have detailed land-use plans before they can begin wildlife management, when few parks have management plans to the same standard”.

Some concern exists that the top-down WMA process could turn rural communities into dependent clients of the conservation agencies as opposed to empowering the communities to take more control over their lives and the management of their wildlife and other natural resources.

²⁵³ Same as CBNRM

Mbarnoti (2004) concludes that

“community scepticism in establishment of Wildlife Management Areas (WMAs) in the Maasai rangelands revolves around lack of transparency, corruption, misguided policies, mistrust, etc. Often, the Question is; But who will really benefit from WMAs???, and/or Is this not a new malicious approach in which the Maasai will end up losers??? This is what people think and say”.

In 2000 a meeting was held in the village of Loibor Siret, with surrounding villages of the Simanjiro District from the wildlife dispersal area east of Tarangire National Park. In attendance were AWF²⁵⁴, TAWIRI, TANAPA and the local Member of Parliament. Already, the people in this dispersal area were wary of the WMAs being an underhanded way of pushing people off their land. Planned in advance, after much pomp and ceremony by AWF and government officials, the morani jumped up with spears and knobkerries and chased these people across the river. Since that date, they have refused to collaborate with AWF (Mbarnoti, *pers. comm.*) Research by Igoe & Croucher (2006) supports these concerns, demonstrating how communities around Tarangire National Park (TNP) have been coerced by African Wildlife Foundation (AWF), “officially designated by the Tanzanian government to oversee the establishment of WMAs in northeastern Tanzania”) and the Wildlife Division into forming Burunge WMA, located on the northwestern side of the park. This has resulted in the eviction of people from the WMA, and mainly brought benefits to safari operators, the Wildlife Division and a few village elites, while meeting the agenda of AWF for fundraising and to form wildlife corridors connecting the major parks of Maasailand.

How well has this program worked so far? Benson Obdiel Kibonde (*pers. comm.*), chief warden of the Selous Game Reserve (SGR), explained that about

²⁵⁴ African Wildlife Foundation, 1400 Sixteenth Street, N.W., Suite 120, Washington, D.C. 20036, U.S.A., Tel: +1 202 939 3333, Fax: +1 202 939 3332, email: africanwildlife@awf.org, <http://www.awf.org/>

37.5% of the Selous's annual budget (about US\$ 750,000 of a US\$ 2 million/year budget) and 45% of the manpower (300 game scouts patrolling 118 days/game scout/year) are used for anti-poaching. Wildlife is being defended, not managed. What this also implies is that "common property" benefits will not stop individuals from trying to gain income at the level of the household. The current level of devolution that puts the majority of the Selous' income in the hands of the government and private sector is unacceptable to communities. These constraints plus likely cultural ties to wildlife through hunting guilds that exist (Kibonde, *pers. comm.*) in the Selous area imply that traditional hunters, *murumba*, for personal gain will continue to hunt illegally unless they are integrated into the management of the Selous and its WMAs. Other resource users (fishermen, honey collectors, loggers, charcoal makers, etc.), trying to raise money at the household level will also continue to "poach" resources until integrated into the management of the Selous Game Reserve (SGR) and other protected areas of Tanzania. As already discussed, just as importantly, may be the feeling of and eventual legal ownership by communities over both the land and wildlife within their WMA. This concept could even extend into the Selous Game Reserve (SGR) that may need to be subdivided into management units protected by local communities, possibly overlaying traditional pre-reserve village territories over the current Selous boundaries.

Placing so much emphasis on anti-poaching takes away from other priorities such as community liaison, wildlife monitoring, habitat management, infrastructure (e.g., roads and bridges) and supervision of hunting/photo safaris (Kibonde, *pers. comm.*). Management will only occur when 95% of the wildlife and other resources are harvested legally and the off-take quantified. Currently, as all over Sub-Saharan Africa, maybe 5% or less of the off-take is legal and quantifiable. A questionnaire survey is underway (Kibonde, *pers. comm.*; Kibonde, 2005) to determine what traditional hunters and their communities want from the game

reserve and to see if there is a way to more positively integrate them into the formal management of the reserve so that the off-take of wildlife and other resources in the reserve can be monitored to assure sustainability. If this goal can be achieved, it will be irrelevant if the bushmeat and other resources are for auto-consumption or commercial trade. Ultimately, while anti-poaching may have helped game populations climb to what they are today in the Selous, in the long-term repression is not sustainable, while community involvement in a constructive way, along with education is the only hope for the Selous to maintain its structural and ecological integrity (Kibonde, 2005).

Ultimately, there is some concern that in reality the WMA process will remain complicated and the process stymied by bureaucracy as a means of the political technocratic elite retaining control over wildlife as a source of wealth linked to patronage and corruption (Jones & Murphree, 2004 *In: Child, B.*, 2004a).

9.6.3.7 Makuleke Contractual Park, South Africa

Contractual parks began in the 1980s with white landowners, enabling them to retain ownership while enabling the National Parks Board to expand areas under conservation. By the 1990s, the South African National Parks (SANparks) was experiencing land claims by rural communities relocated during the Apartheid period to expand parks and protected areas. Degazetting portions of a national park to a lower level of protection, thereby creating a “contractual park”, allowed multiple use of resources by communities, while being co-managed by SANparks and the local community. This is one mechanism by which SANparks has been able to maintain the integrity of its protected area system, while accommodating the needs of communities reclaiming their traditional territories. Contractual national parks are managed under a joint agreement between SANparks and the landowners, with most of the management delegated to SANparks, though such

responsibilities may be negotiated through a joint management board. In some (e.g., Richtersveld) but not all contractual parks (e.g., Makuleke), a ground rental is paid to the community (Reid & Turner, 2004 *In: Fabricius, et al.*, 2004).

The South African “Group Areas Act” resulted in the forced removal of seven villages belonging to the Makuleke in 1969 (DeGeorges, 1999a; Steenkamp & Uhr, 2000) and about 3,000 people (Mahoney & van Zyl, 2001). People were removed at gunpoint, homes burned and resettled on the border of the Kruger National Park (KNP), about 30 km southwest of the current contractual park (see Chapter 3, Section 3.6.2, Forced Removal, Kruger National Park, South Africa). This was done against the will of the people, many fleeing to Zimbabwe. There are strong kinship ties between the Makuleke community and two adjacent CAMPFIRE areas in Zimbabwe. The Makuleke are Shangaan, a hunting culture with strong ties to wildlife (DeGeorges, 1999a).

In 1994, under the new South African dispensation, the Makuleke community took the South African government to court to claim their land back. They are one of the first rural communities to have won their land claim and to have received restitution (DeGeorges, 1999a).

The current community consists of about 1,200 households with about 10,000 (DeGeorges, 1999a) to 15,000 beneficiaries (Mahoney & van Zyl, 2001). They currently live from subsistence farming and remittances from family working in urban centers and the mines (DeGeorges, 1999a).

The Makuleke community has a freehold title over the 25,000 ha contractual park, “Crooks Corner”, situated at the extreme northern part of the Kruger National Park. They can develop the land as long as the conservation status is unchanged. This area must stay in conservation for 99 years, while being leased to SANparks

for 50 years (Reid & Turner, 2004 *In: Fabricius, et al.*, 2004). They have formed a legal entity known as a communal property association (CPA), which can enter into joint venture with the private sector (DeGeorges, 1999a; Reid & Turner, 2004 *In: Fabricius, et al.*, 2004).

A joint management board has been formed made up of 50/50 representation from both the Kruger National Park and the CPA, who jointly develop an environmental management plan for the contractual park. This includes sustainable use of the natural resources such as hunting within the area of the contractual park (DeGeorges, 1999a; Reid & Turner, 2004 *In: Fabricius, et al.*, 2004). However, typical of Southern Africa where communal lands abut against state parks, Jones and Murphree (2004 *In: Child, B.*, 2004a) believe that co-management agreements in both the Makuleke and Richtersveld Contractual Parks are the result of unequal negotiation between a relatively disadvantaged community and a sophisticated and advantaged SANparks, which results in manipulated compliance and continued expropriation with limited community empowerment. For instance, to date, traditional hunting in the contractual park is prohibited by the Makuleke community members. Likewise, Colchester (2003) notes that in general most “joint management” schemes are “joint” in name only since local communities lack political power and financial resources, making them junior partners in decision-making.

All commercial rights are vested in the Makuleke CPA, but these activities must be compatible with the environmental management plan developed by the joint management committee (DeGeorges, 1999a; Reid & Turner, 2004 *In: Fabricius, et al.*, 2004). Over the first five years, SANparks will pay all environmental management costs. After five years, SANParks and the CPA will share the costs for environmental management of the contractual park, with costs to the CPA never to exceed 50% of their net profits. SANParks is willing to cover more costs

than the CPA as compensation for the state disallowing cattle and mining in the negotiated agreement (DeGeorges, 1999a).

Through a distance-learning program, 30 Makuleke youth are being trained in wildlife management. Slowly, over the next five to ten years, they will accept more responsibility for managing this area, with long-term technical backstopping from the Kruger National Park staff. An NGO, the Friends of Makuleke, also provides the community with advice and training (DeGeorges, 1999a). Additional concerns over the future of CBNRM in this area are discussed in Chapter 11, Section 11.11.5, Transfrontier Conservation Areas (TFCAs), Southern Africa.

9.6.3.8 CBNRM, subsistence fishery, Lake St Lucia, KwaZulu-Natal, South Africa

The following is extracted from Crook and Mann (2002). The 35,000 ha Lake St Lucia is the largest estuary on the eastern seaboard of Africa, situated in KwaZulu-Natal. It is part of the 250,000 ha Greater St. Lucia Wetland Park. It is an important nursery for marine fish and a World Heritage Site (Also, see Chapter 8, Section 8.14.1, Community Coastal Zone Management, Tanzania).

Relations between the local fishing community and the KwaZulu-Natal Nature Conservation Service (KNNCS), the old Natal Parks Board/NPB – in 2005 KwaZulu-Natal Wildlife, have been poor due to attempts by the provincial government agency to stop illegal netting. In 1992, there were about 72 illegal gill-netters operating, who relied on fishing for both food and income. They had an estimated 10 km of net, while annual yield/catch amounted to 91-135 tons/year. Although the authors call this fishery a “Common Property Resource”,

it was really an “Open Access Resource” that local government tried to manage, while cutting out the resource users, local fishermen.

The Oceanographic Research Institute (ORI) recommended a small legal subsistence gill net fishery, involving local people in the management of the fishery, which began in October 1994. Fishing committees were elected in three communities to represent fishermen in negotiations.

It was agreed that fishing would not take place around the river mouth that fish use as a refuge during high salinities. Based on the number of netters, the length of shoreline and estimated sustained yield, the number of allocated permits and total length of nets allowed was agreed on. Enumerators from the villages were trained to record catch data.

It was found that restrictions on the numbers of various species that could be caught/day was not enforceable since certain restricted species made up major components of the catches and the fish were dead by the time the gill nets were pulled.

The success at decentralizing control to local communities varied with community. In one village, Mduku, the *inkosi* (chief) was respected by the community. Only members with permits were allowed to net, monitoring was undertaken and violators were sanctioned (not allowed to fish). Fish were caught and sold within the community. They were unable to prevent fishermen from the neighboring community (Nibela) from fishing in their area.

At Nibela, there was no *inkosi*, the tribal authority was not respected, and some headmen (*izinduna*) and fishing committee members were believed to have a stake in illegal fishing. Illegal fishing on a large scale was a major problem.

The headman in charge of another community, Nkundusi, was supportive of legal fishing but was replaced. Unlike the other communities, the fishing committee charged fees for permits and fined people who broke the law; the money was supposedly used for the good of the fishery, but with no transparency. Illegal netting continued.

In addition to illegal netting at Nibela and Nkundusi, other common issues that lead to corruption and poor organization included:

- Fish, often undersized and restricted species, were often sold outside of the community;
- Illegal net fishing increased since the onset of the legal fishery despite the under-utilization of legal nets since fishing committee members claimed permits they did not use, but which cut off others from legally fishing;
- Even though the legal length of a net was 30 meters, the NPB removed nets from 50-900 meters, some with legal permit tags; and
- At Nibela and Nkundusi, fishing committees made up of once-off elected members that fishermen could not change, imposed rules that could not be modified by the fishermen, the possibility for change being essential if CBNRM is to work.

In all three areas, there was no re-election process for the fishing committees, so that accountability to members was non-existent. All committees asked for more permits, longer net limits and increased fishing areas, even though the permits were under-utilized. The KNNCS was required to enforce fishing area boundaries, something the communities were unable to accomplish.

The authors of this case study believed that the only way to get the communities self-organized was to threaten the communities with gradual withdrawal of netting rights by KNNCS. Those communities such as Mduku would not be penalized, while the other communities undertaking illegal fishing would be. An important first step is that communities must restrict access to the fishery and determine who within the community can fish, when and for how long. Monitoring will be necessary to assure the rules of the game are abided by. If the fishermen believe in the rules (e.g., are involved in determining the rules that are to their benefit), then they can undertake self-monitoring. For large areas, sub-organizations undertaking self-monitoring may be more effective. Peer pressure must be used to stop violators. For this to work there must be a respected community authority to control conflict, power struggles and agreed-on rules. If communities cannot be organized to manage the fishery resource as a “common property”, it will likely return to an “open access” resource.

Similar experiments are taking place in the Niger Delta of Mali moving from failed state centralized fisheries management that was in conflict with traditional localized management systems to more decentralized local management by stakeholders (Läe, Williams, Malam, Morand & Mikolasek, 2003).

9.6.3.9 Community fisheries management, Queen Elizabeth National Park, Uganda

In the past, the Queen Elizabeth National Park, Uganda, was known as having among the highest wildlife biomass in the world. In the late 1960s, the wildlife biomass was estimated at 29,490 kg/km². The only area that had a similar biomass was the contiguous *Parc National des Virunga* in the DRC with 20,470 kg/km². In comparison, the Serengeti National Park has no more than 6,300 kg/km². Historically, a few large species furnish the majority of biomass including hippo,

elephant, buffalo, Ugandan kob and topi. However, due to Uganda's 15-year civil war, their numbers were greatly reduced and they are currently recovering (Olivier, 1990 In: Ogwang & DeGeorges, 1992) (Table 9.5):

This dramatic decline in most species in the Queen Elizabeth National Park is indicative of what occurred across Uganda. There was less information available on other species found within the park including: the Ugandan defassa waterbuck (*Kobus defassa ugandae*), warthog (*Phacochoerus aethiopicus*), Nile bushbuck (*Tragelaphus scriptus bor*), Eastern bohor reedbuck (*Redunca redunca wardi*), giant forest hog (*Hylochoerus meinertzhageni*), bushpig (*Potamochoerus porcus*), sitatunga (*Tragelaphus spekei spekei*), four species of duiker, chimpanzee, red colobus, lion, leopard and spotted hyena. Published sightings existed of 545 species of birds, greater than any other park in world (Ogwang & DeGeorges, 1992).

Table 9.5: Changes in wildlife numbers of key species contributing to biomass, Queen Elizabeth National Park, 1969-1992

Species	Year 1969/70	1992	Percent Decline
Hippo, <i>Hippopotamus amphibius</i>	10,500	500	-95
Elephant, <i>Loxodonta africana knochenhaueri</i>	2,500	225	-91
Nile Buffalo, <i>Syncerus caffer aequinoctialis</i>	16,000	<5,000	-38
Topi, <i>Damaliscus lunatus jimela</i>	4,500	500	-89
Ugandan Kob, <i>Kobus kob thomasi</i>	10,000	17,500	+75
Extracted From: Olivier, 1990 In: Ogwang & DeGeorges, 1992			

Fishing Enclaves on Lakes George and Edward

When the Queen Elizabeth National Park was established in 1952, fishing villages were left as enclaves within the park on Lakes George and Edward. They were meant to be fishing camps of a temporary nature inhabited by men without their families. They have evolved into towns with schools, post offices, Resistance Committee/Council (RC)— local political units of government), etc. (Ogwang & DeGeorges, 1992). The park was created during a period when the area had been largely depopulated by the colonial government in the fight against sleeping sickness (Barrow, *et al.*, 2000).

In a 4,315 km² survey of the area of which the park constituted 54%, there were an estimated 79,000 houses, 17,000 cattle and 6,000 sheep and goats. Cattle density outside protected areas was 1.5 times the Uganda kob density: 13 cattle/km² versus 8 kob/km². In 1992, there were ten fishing village enclaves within the park with a total human population of 19,930 residents on park land. It is unclear, but a population of 9,421 appeared to be permanent residents, while the remainder appeared to be transients (e.g., family, traders, seasonal fishermen, etc.) who come and go (Ogwang & DeGeorges, 1992).

The annual fish catch of 5,000 metric tons for Lake George and 4,000 metric tons on Lake Edward was valued at US\$ 5.0 million. Fishermen were mostly hired labor from outside employed by boat owners who hold fishing rights (Ogwang & DeGeorges, 1992; Barrow, *et al.*, 2000). Only 10% of the village inhabitants were fishermen, while 60% of residents were women and children. It was estimated that 82% of the household heads were born outside the enclave villages, 59% had land outside the park (Infield, 1989 *In:* Barrow, *et al.*, 2000; Ogwang & DeGeorges, 1992) and 56% engaged in business services [e.g., importing matooke bananas (39% of imports) and other foodstuffs (29% of imports)] (Ogwang & DeGeorges, 1992).

Total annual wood consumption as fuelwood for charcoal and fish smoking was 6,883 m³ for park enclaves, much of which was from the park, and another 11,893 m³ from public enclaves and other villages close to the park. Other vegetative resources extracted from the park included building poles, papyrus (*Cyperus papyrus*) stems for thatch and fishnet floats cut from the ambatch tree (*Aeschynomene elaphroxylon*) (Ogwang & DeGeorges, 1992).

“Despite occasional attempts by the park management to remove villages from the park, and a general tension between the park authorities and the fishing communities, the industry has continued given its importance to the local economy. In recognition of this the park was declared a Biosphere Reserve in 1979, and the current management plan provides for zoning of the park into strict conservation areas, tourism areas, multiple use areas, and development areas. Community conservation initiatives in Queen Elizabeth National Park have developed largely in relation to the existence of the fishing villages. The peculiar nature of the villages has, however, made the development of community programs difficult. The villages have a small core of permanent residents, but a large number of transient workers or business people, attracted by the ready availability of cash” (Barrow, *et al.*, 2000).

In a meeting with RC3 chairmen, fishermen explained that Lake Edward is “their garden”. It was in their vested economic interests to protect their fishery resources. They were constantly fighting against illegal fishermen and the use of small mesh nets using self- and joint-patrolling with the Queen Elizabeth National Park staff. They requested that the Kampala net company stop supplying small mesh net to the community shops (Ogwang & DeGeorges, 1992).

They were also in the process of establishing "no-fishing nursery grounds", based on their knowledge of the biology and life history of the lake's fish. This was being undertaken in collaboration with the Fisheries Department (Ogwang & DeGeorges, 1992).

“Early initiatives included negotiated agreements with communities to allow access to firewood in the park, used for both domestic cooking and for fish smoking. Agreement was also reached to allow harvesting of papyrus for the roofing of village houses. More recently, a CARE project has been initiated to work with the fishing village communities on improving fishing methods, developing improved fish smoking kilns to reduce the quantities of fuel used, and establishing wood lots to supply the demand for fuel wood without recourse to the park’s wood resources” (Barrow, *et al.*, 2000).

One of the key hotel staff, who was also from the area, explained that to survive, local people needed resources located in the park and that cutting them off was only to ask for poaching and misuse of the resources. He felt strongly that controlled access and management of critical resources in multiple use areas of the park and its buffer zones was the best solution (Ogwang & DeGeorges, 1992).

“Conservation with the People” is clearly a stage too short.

It must be mentioned that 10,000 Basongora nomadic herders and their 40,000 cattle, chased out of the adjacent *Parc National des Virunga* in March 2006 and allowed to settle a 300 km² of the 5,100 km² Queen Elizabeth National Park, are threatening wildlife, especially lion, leopard and hyena that are being poisoned by the herders. Buffalo are showing signs of foot-and-mouth, a viral disease carried by cattle and pigs. This damage could take another 20 years to reverse (Ryu, 2007).

9.7 CBNRM SHORTCOMINGS, STAGE 3 CONSERVATION/WILDLIFE MANAGEMENT WITH THE PEOPLE

The anti-sustainable use movement (animal rights) and those who believe in state control and/or the decoupling of human needs in development projects from the harvest of large mammals have spoken out against the merits of CBNRM.

However, there has also been criticism from those who support the tenet of rural communities being integrally linked to the future of Africa's biodiversity, conservation and development that CBNRM initiatives and projects (Murphree, 2001 *In: Baldus, et al.*, 2001):

1. Make unwarranted assumptions about the existence and profiles of communities;
2. Encourage stratification and inequality within communities;
3. Are externally initiated and imposed;
4. Can be co-optive mechanisms for the indirect re-establishment of state or elite control;
5. Lack mechanisms for accountability and transparency, internally and externally resulting in corruption and nepotism at communal and higher levels;
6. Involve high transaction costs, especially time;
7. Require high facilitation input costs;
8. Require long start-up time frames;
9. Show little evidence that they encourage sustainable use or are sustainable themselves; and
10. Lack the technical and financial capacities for natural resource or institutional management.

Additional/similar shortcomings identified by Hitchcock (2000b) include:

1. Lack of sufficient technical assistance and training provided to members of the community;
2. Lack of sufficient information provided to the community about the options that they have;
3. Lack of sufficient emphasis on community participation in decision-making;

4. Unwillingness of higher-level institutions to devolve authority to communities to manage their own resources;
5. Economic benefits are captured by higher-level and middle-level institutions while local people receive relatively few direct benefits;
6. There often is inequity in the distribution of benefits at the community level along the lines of age, gender, class, and ethnicity;
7. While some jobs have been created such as community escort guides (CEGs), the numbers of these jobs tends to be low and the majority of the jobs tend to go to adult males and not to females or children; and
8. Local people tend to bear greater costs from increased biodiversity conservation efforts; for example, they tend to be arrested at higher rates than the general public for allegedly engaging in illegal activities such as hunting or collecting wild plants in conservation areas; they also tend to lose access to land and natural resources as a result of the establishment of protected areas.

Hitchcock (2000b) notes that most benefits go to common property benefits (e.g., roads, school, clinics, boreholes, etc.) that

“tend to mimic public goods...,” all members of the community benefit from them whether or not they engage actively in community-based conservation and development activities. Given these constraints, it is not surprising that local people often are reluctant to accept the structure of incentives offered by these new programs”.

An International Institute for Environment and Development (IIED) analysis (Fabricius, *et al.*, 2001) came up with shortcomings similar to the above plus:

- Widely diverging goals among stakeholders (e.g., government, private sector and community) often resulting in conflicts over resource use and human impacts on biodiversity;
- Intra-community competition for access to resources and benefits, sub-units within the community with different goals and aspirations;
- Communication gap between scientists/researchers who hold formal knowledge and local communities/resource users with informal knowledge, especially over what level of resource use is sustainable;²⁵⁵
- Community rarely makes the linkage between benefits and sustainable wildlife/resource management;
- Question of whether donor funds would be best used to build institutions as opposed to helping individual entrepreneurs; and
- Household benefits tend to be very low, though more important may be political empowerment, biodiversity conservation and increased cultural awareness.

Benson and Darracq (2001), viewing the world as a multi-dimensional set of parameters, came up with similar constraints, which must be addressed at an individual, group and societal level to illicit attitudinal changes towards the environment in becoming natural resource stewards. These same parameters must also be addressed if CBNRM, as an applied concept is to prove sustainable. This includes (Benson & Darracq, 2001):

1. The earth's physical and biological systems;
2. Economics (money and trade) regulating the exchange of goods and services;

²⁵⁵ Note: The authors' experience is that very often scientists and researchers are not trained in adaptive management – that is determining sustainable off-take quotas and thus take the precautionary principle noted in Section 9.2.1, Precautionary Principle; Studying Wildlife to Extinction – that is assume that the resources must be protected rather than utilized.

3. One's personal psychology, personality, wants, needs and investment in the issue;
4. The norms of the group, society and cultures that enable or restrict the actions of individuals and the group as a whole;
5. Power structures through laws and political systems that protect or suppress the rights of individuals and society; and
6. Implementation opportunities or barriers where appropriate technologies, skills and administrative authorities to perform desired tasks are encouraged, discouraged or nonexistent.

Most CBNRM Stage 3 programs tend to be too narrowly focused, the majority of CBNRM programs focusing on “economics” and “legal/enforcement” while failing to address individual and societal norms and their ties to wildlife, land and other resources. Many collect no biological or physical data as a means of monitoring sustainability.

The above concerns and others are discussed below in some detail.

9.7.1 Socially Constructed Stalemates

This term applies to situations in which interest groups working in parallel block the achievement of the objectives of each other. An example would be a situation in which a conservation agency attempts to conserve wildlife in a protected area and to generate revenue through tourism by leasing concessions to tour operators. Meanwhile, the principal economic opportunity of adjacent communities is traditional hunting (currently illegal). The conservation agency tries but is unable to effectively enforce the law. The tour operators are unwilling to contribute to the local economy and the communities have no option but to continue hunting (illegally), turning wildlife into an unmanageable open access resource, which

reduces the conservation status of the wildlife and reduces the value of the tourist assets. This is a socially constructed stalemate, a lose-lose situation. It results from the capacity of each party being sufficiently balanced to allow each to veto the agenda of the others and/or to accept the needs of others and their integration into the formal management of the area. It is important to realize that rural communities, while holding very limited formal authority or capacity, hold major powers of veto over the formal sector because of their overwhelming numbers on the ground and local knowledge (Bell, 1999).

The way to escape the stalemate is for each party to compromise sufficiently to give the other enough of what its members want in order for them to withdraw their veto (Bell, 1999). This rarely happens when decisions come from the top and are sent to the bottom, government game departments, safari and tourism operators imposing restrictions on communities with little or no dialogue.

9.7.2 Reluctance to Devolve Control and Ownership of Resources to Landholders

Murphree's (Marshall) Law states that

“all societies are stratified. Each stratum strives to wrest control of decisions and money from levels above and resists devolution of control to levels below”.

The operation of Murphree's Law results in the characteristic “aborted devolution of authority” as the commonest constraint to the successful implementation of CBNRM. Typically, Murphree's Law can be seen in the unwillingness of government authorities to devolve control of resource management to the community level. The operation of Murphree's Law may be seen as the effect of

human nature operating in a vertical sense, between levels of society (Bell, 1999; Duffy, 2000). Child, B (2004a) argues that in fact

“devolved conservation is a direct antidote to the elite capture of the past, with the massive challenge of transferring control from a few techno-bureaucrats to hundreds of thousands of ordinary people”

which at the core are full and clear rights to benefit, manage and allocate resources.

“Power structures at the political and economic center are not disposed to surrender their privileges, and will use their power, including their ability to shape policy and law, to maintain the monopolies of their position...The reason lies fundamentally in the value of natural resources and the importance of power to control and benefit from them. The history of colonial Africa is a history of the appropriation of this power and benefit by the state from those who live with and use natural resources; rural communities. This was accomplished by the state declaring ownership over natural resources and in turn conferring weak user rights to the land on which communities live. Without exception, this condition has persisted into modern post-colonial Africa. Thus communal lands continue to be in various degrees of fiefdoms of state bureaucracies, political elite and their private sector partners”
(Murphree, 2001 *In:* Baldus, *et al.*, 2001).

Speaking of the LIRD program as it relates to devolution, Child and Clayton (2002) state that

“often mis-managed community programs are actually manipulated to dis-empower rural people (Ribot, 2001 *In:* Child & Clayton, 2002). This leads us to conclude that only fiscal devolution to a scale that allows face-to-face decision-making and accountability, and that operate through institutions that are carefully designed to incorporate the principles of democracy, transparency, equity, and accountability to a constituency, will be ultimately successful. Consequently, we are optimistic about the

ability of communities to integrate local resource management. However, we are also pessimistic about whether the state hegemony will encourage, or even permit, this to happen”.

Speaking of forestry, but equally applying to wildlife, Messer (2001) also believes that IMF/World Bank structural adjustment policies (SAPs) have been counterproductive to full devolution since cash strapped governments in Sub-Saharan Africa hang on to the resource as a major source of income.

“In Africa – including Sub-Saharan Africa and North Africa – perhaps more than elsewhere, decentralization programs have been much influenced by donor conditionalities and the downsizing of central bureaucracies due to financial constraints. This phenomenon is, paradoxically, both a factor driving decentralization, and also an obstacle thereto. The high indebtedness of national governments often forces them to sell to foreign companies logging rights, mining concessions, estate crops, etc., within large tracts of rural areas, a source of revenue that would diminish considerably if full decision-making power over those rural areas were devolved to the populations living on them” (see Chapter 12, Section 12.3.4.1, Downsizing governments).

Decentralization (e.g., co-management or collaborative negotiated management) is the delegation of responsibility and limited authority to subordinate or dispersed units of hierarchical jurisdiction, which have primary accountability upwards to their superiors in the hierarchy (Murphree, 2001 *In:* Baldus, *et al.*, 2001). Unfortunately, this process which should lead to “devolution” is fraught with many obstacles, mostly linked to “Murphree’s Law”, in which the economic strata above is reluctant to devolve authority and thus economic gain to the next lower level of society. Messer (2001) in describing decentralization as it applies to community management of natural forests states that

“ultimately, decentralization involves an epistemology²⁵⁶ clash of different conceptions of forests and NRM (Natural Resource Management) between the rural dwellers using them on a daily basis and the mostly urban-educated individuals staffing ministries”.

Most CBNRM programs (CAMPFIRE, ADMADE, SCP, Botswana Trusts, LIFE, Cullman Hurt) are stuck in this mode where communities lack true empowerment and ownership over their wildlife. For instance in Namibia, the 1996 Wildlife Conservation Amendment is enabling to communities, while Ministry of Environment and Tourism regulations are restrictive and prescriptive, not allowing communities the autonomy to define who can be conservancy members/beneficiaries. Rights are limited, communities being able to make few crucial management decisions without permission from government (Long, 2004)

Devolution involves the creation of relative autonomous realms of authority, responsibility and entitlement with a primary accountability to their own constituencies. In essence, this is what exists on private white-owned game ranches in Namibia, South Africa, Botswana, Zambia and at one time Zimbabwe (prior to the radical land reform policies of 2000). Devolution of such authority to communal areas faces strong and entrenched opposition by the state, its bureaucracies and the private sector.

The state is loath to legitimize local jurisdictions in ways that diminish its ability to claim the benefits from these resources. The “wildlife pie” is only so big and governments are reluctant to see their share diminished. This can be linked to the patronage politics and corruption endemic to much of Sub-Saharan Africa, with the distribution of wealth from wildlife to the elite, their cronies and extended families being no different than what commonly happens with mineral and

²⁵⁶ Study or a theory of the nature and grounds of knowledge especially with reference to its limits and validity (Webster, 1967).

petroleum resources, timber, etc. across the subcontinent (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, the Big Man and “Cosmetic Democracy”). Even when the state grasps the importance of local management and stewardship, it prefers decentralization (local government control as opposed to central control) over devolution. Thus, central government is relieved of having to provide administrative and development subsidies to local government, as in Tanzania and Zimbabwe’s programs to date. The political class seems to have no power in transforming the autocratic postcolonial state, with devolution of land and resource tenure being inextricably linked to democratization (Jones & Murphree, 2004 *In: Child, B.*, 2004a).

Boone (2003) presents a political model (see Chapter 3, Figure 3.1): Determinants of institutional arrangements between rural societies and colonial/post-colonial governments, in which the willingness of government to devolve control over resources depends on the value of the resource and the strength of the rural elite to bring their constituencies into the modern political arena to support the elite running the modern states left after colonialism:

- **Power sharing** when there is a valuable resource and the rural elite are politically powerful – indirect rule/devolution, but devolution often meaning that a local rural elite along with central government are the beneficiaries, not the rural masses;
- **Usurpation** when there is a valuable resource and the rural elite may be politically powerful but are not dependent on or offer anything by central government cooperating - direct rule, centralized authority often using government bureaucracies, parastatals and even military/police forces;
- **Administrative occupation** when there is not a strong rural hierarchy that can be used to control the rural populace – direct rule/decentralization with local government officials managing the people and the resources,

mostly to the advantage of the state but with little input or support from the state; and

- **Non-incorporation**, indirect rule or devolved authority in areas where there are no valuable resources (e.g., nomadic areas of the Sahel).

Boone's (2003) model was undertaken primarily in analyzing farming in West Africa and decisions by central government regarding approaches to governance, which are based on existing social structures and on central government's ability to access wealth generated from the resource base.

This model can readily apply to other resources. Certainly, as is seen with case studies in this and other chapters, full devolution is far from being achieved, with a small percentage, if any, of the profits reaching the rural people. In most cases, one observes what appears to be a form of usurpation in which bureaucracies and middlemen (safari, tour operators, logging, mining companies and NGOs) are placed in rural areas to extract the wealth, both directly and indirectly, while the majority live in poverty and are often repressed by these middlemen. This is certainly true for the wildlife covered in some detail in this chapter and for fisheries, especially the Nile perch as discussed in Chapter 4 and the kapenta discussed in Chapter 7 on dams (see Chapter 7, Section 7.8.5.3, Kariba Dam, Zimbabwe, Zambezi River; Section 7.8.5.4, Cahora Bassa Reservoir, Mozambique). Commercial logging as discussed in Chapter 11 in Cameroon (Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the *Dobi Dobi*, More Parks and Protected Areas) and Congo Brazzaville (Chapter 11, Section 11.11.7, Case Study Bongo in the Congo [Brazzaville]) is another example of usurpation. In the extreme, the Selous program might be considered a form of usurpation in which paramilitary forces, costing upwards of US\$ 750,000/year of a US\$ 2 million annual budget (see Section 9.5.7, Selous Conservation Program [SCP], Tanzania

& Section 9.6.3.6, SCP, Tanzania), are used to repress the local inhabitants as a means of keeping them from accessing natural resources in the reserve, while middlemen – safari operators – extract wealth for themselves and the bureaucratic elite in the name of conservation. The case studies on the Comoé-Leraba Game Reserve in Burkina Faso (see Section 9.8.9, *Gestion des Terroirs*, West Africa), the Mpembeni Community Conservation Game Reserve in South Africa (see Section 9.8.11, Emerging Community Devolution Model - Public/Private/Community Partnerships (PPCPs) - Mpembeni Community Conservation Game Reserve – Hluhluwe Game Reserve - South Africa), the artisanal fishery of the St. Lucia Estuary (see Section 9.6.3.8, CBNRM, subsistence fishery, Lake St Lucia, KwaZulu-Natal, South Africa), the IIngwesi Group Ranch in Kenya (see Section 9.8.7, IIngwesi Lodge, Mukogodo Pilot Tourist Program, Kenya) and the newer CBNRM models such as the Botswana Trust Model and LIFE in Namibia are moving towards power sharing with local communities. In some cases, the pressure does not come from within but from international donor agencies and NGOs, which puts into question whether imposed solutions are sustainable once these external forces are removed as noted in the Botswana Trust Model where once USAID funding ended, so did government enthusiasm. Programs such as the Rwenzori Mountaineering Services (RMS) of Uganda (see Chapter 11, Section 11.11.3, Rwenzori Mountains National Park - a success story of rural people managing a natural area, and then foreign aid and NGOs arrived) and the Makuleke community of South Africa (see Section 9.6.3.7, Makuleke Contractual Park, South Africa) resulted from a change in governments with new and dynamic leadership that wished to empower local people and likely to some degree well organized rural communities (Bakonjo in the Rwenzoris) or support from outside NGOs (e.g., Friends of the Makuleke) that enabled these communities to negotiate power sharing relationships economically and to some degree in management.

Contreras (2000 *In:* Messer, 2001) sums up obstacles to effective devolution in Sub-Saharan Africa:

- “The lack of financial resources at local level whether they are transferred from the centre or mobilized locally;”
- “The general structural weakness of African forestry institutions” (also wildlife, fisheries and park institutions);
- “Policies and legislative bodies continue to be based on weak centralized institutions inherited from the colonial period;”
- The tension between weak-modern-urban versus strong-traditional-rural systems of governance;
- “The reluctance of central bureaucrats to transfer responsibilities downward for fear of losing prestige and job security;”
- “The resistance to establish legal pluralism, that is to say enforcement and regulation powers at the decentralized levels;” and
- “The legal texts do not clarify the powers and responsibilities of decentralized institutions and local communities and the rules that would govern their relations”.

This tendency (state preferring decentralization over devolution) is the primary reason for the failure of programs to create local natural resource management jurisdictions. Responsibility is divorced from authority and entitlement, these programs remaining co-optive rather than empowering (Murphree, 1998a; Murphree, 2001; Baker, 2002). This is institutionally fatal, since when authority and responsibility are separated, institutions rarely perform effectively (Murphree, 1998a). As a result, commonly, “community-based” resource management initiatives turn out to be efforts to co-opt or bribe local peoples while authority remains firmly held in state hands (Murphree, 1998a).

Thus, in cases like CAMPFIRE, Tanzania's WMAs and the Botswana Trusts, the top-down preferences of central government have merely been replaced to a large degree by the top-down preferences of local government and/or the central government still retains much of the decision-making authority and economic benefits. Thus, people participate in projects, but the state retains a large measure of direction and control. Local government often resists accountability and becomes a de facto local agent of central government (Katerere & Chikoku, 2002 *In: WSP*, 2002). In Zimbabwe's communal areas, Hasler (1999) concludes that

“in fact all of the current and previous scrutiny points to one major analytical critique: that the CAMPFIRE movement needs to rigorously accept the ultimate goal purpose and spirit of the fledgling project: the devolution of legal rights and management functions to local (village) level in order to foster the sustainable management of wildlife by people affected by wildlife”.

Another reason devolution often fails is that NGOs wish to control CBNRM programs, making themselves indispensable middlemen, as a means of obtaining donor moneys on which they survive (Katerere & Chikoku, 2002 *In: WSP*, 2002). This is often a hindrance to local communities going through the process of making their own decisions, learning from their mistakes and in the process becoming independent in decision-making.

Decentralization falls short of the combination of authority, responsibility and entitlement required for CBNRM or “Conservation by the People”. Thus for CBNRM or “Conservation by the People” to work, a strong devolutionist approach is needed in which the locus of initiative and decision-making is shifted from the state to relatively autonomous localized jurisdictions. The role of the state changes from being directive and inhibitive to facilitative through providing coordination, extension, infrastructure and arbitration. Enforcement is a last resort, which should come from the local community to protect its natural

resources from outsiders or its own members who fail to abide by established community laws.

For CBNRM to work, there will have to be significant transfers of power, rights, resources and the right to directly benefit from the sustainable management of these resources. There will be winners (community) and losers (government and private sector). Until devolution is the official policy, CBNRM, conservation and development will deal with the symptoms rather than the causes for the failures to date (Murphree, 2001 *In:* Baldus, *et al.*, 2001). Hulme and Taylor (2000 *In:* Lee & Kirkpatrick, 2000) back this up by concluding that wildlife utilization as a long-term sustainable land use option can be considered unlikely unless 1) appropriate authority is devolved from the district (local government) to the ward (local villages) level and 2) community wildlife producers participate in the decision-making framework, involving local communities as active participants instead of passive recipients in natural resource management (e.g., becoming involved in wildlife monitoring, quota setting, anti-poaching, community run hunting and tourism companies and selection of joint venture partners).

9.7.2.1 Devolution through policy reform, land and resource tenure

“Historically control over land...has always been vital to the livelihoods of the world’s poorest people. Lack of access to land not only denies people the ability to gather their own foods: it also excludes them from a source of power. Who controls this land – and how they do so – affects how land is used and to whom the benefits accrue” (Suliman, 1999 *In:* Koch, 2004 *In:* Fabricius, *et al.*, 2004).

“Unless property rights (land tenure) of long-term residential peoples are respected and economic benefits from the creation of protected areas accrue in part directly to the communities living in and near them, it is unlikely that nature reserves will endure. Local communities must also be involved in the planning and boundary

marking of reserves. Most important, their traditions must be respected” (Kemf, 1993 *In: Colchester*, 1994).

“Consequently, while what is wild cannot in the strict sense be owned, giving the right to use it to those who hold title to the land where it occurs creates a sense of ownership in the wider sense. Where the connection between land tenure and user rights has this result, trade is least likely to produce declines. The owners of the land feel they own its wildlife and it is no longer free for anyone to take. Where user rights have not been married to land tenure, conservation has seldom worked” (Parker, 2004).

Junge (2004) states that the lack of ownership or tenure over land and resources and their corresponding benefits is a major reason why so many development initiatives have failed over the past decades. Without secure rights of access to natural resources, rural people will not have a long-term interest in managing them or participating in CBNRM. Tenure also can be regarded as the extent to which an individual or community has rights of access to a resource and the degree of those rights (IUCN/SASUSG, 1997).

“Secure tenure over, or clear use rights to, land and natural resources is of crucial importance if rural people are to manage their resources (Barrow, 1990; 1996 all *In: Barrow, et al.*, 2000). Land reforms aimed at securing these rights and obligations are essential for improving natural resource management” (Barrow, *et al.*, 2000).

Watkin (2003) advocates that tenure must address all resources and not just land. Barrow, *et al.* (2000) provide the following information (Table 9.6) summarizing tenurial systems [see Chapter 5, Section, 5.6.1, Colonialism and its Impact on Land/Soil Degradation and Agriculture in Sub-Saharan Africa (SSA)].

Table 9.6: Links between different tenurial arrangements and potential for community conservation		
Tenure: State	Tenure: <i>de facto</i> people	Tenure: <i>de jure</i> people
National park, game Reserve, Forest Reserve	Customary, trust, mailo (in Uganda)	Titled group or individual, company, freehold/lease
Conservation main objective either national or global, rarely local	Conservation seen as component of rural livelihoods & rural economics – often negative	
Protected Area Outreach	Collaborative management arrangement	Community-based conservation
Revenue & benefit sharing, conflict resolution, Problem Animal Control (PAC)	Agreement on resource use by type, amount, whom & over what time frame; conflict resolution, problem animal management	Conservation as part of land use – may be a major component – & so more likely to be used sustainably; or may be minor, & unless critical to people, will probably not last. Basis on cultural & economic benefits which accrue
Wildlife part of ‘controlled, ‘pristine’ landscapes. Control vested in state		Wildlife as part of ‘managed’ landscape. If wildlife is not a significant economic component, it will probably tend to disappear, and be substituted by ‘more economic forms’ of land use. If wildlife is a significant economic component to users, then population pressures, & issues of inclusion & exclusion will be important so that wildlife can continue to be economically important

Source: Barrow, *et al.* (2000). Reproduced with permission, IIED, www.iied.org.

Barrow, *et al.* (2000) explain the following.

“Today, two sets of contrasting tenure rules co-exist in the region: statutory and customary. Conflict arises because in statutory law land is treated as a single unitary resource, while in customary law it is not. Customary law distinguishes in detail between resources and is a complex bundle of rights of access, of renewable or consumptive use, and of disposal. Such rights may be disaggregated by resource; or certain wildlife may be used under certain conditions and at certain times by defined groups of users; or individual trees or groups of trees may be subject to different rights by product and by time, for instance when to grow or browse (Barrow, 1996 In: Barrow, *et al.*, 2000). While communal tenure is complex, it has two essential elements: equal access to land, and the legal and economic fact that land is not a commodity (Okoth-Ogendo, 1988 In: Barrow, *et al.*, 2000). Government policy tends to promote privatization of land, since land suitable for cultivation is

thought to be under-utilized if left to, for example, pastoralism. This misconception has allowed private individuals, parastatals and government bodies to take over such land. Confusion over the relative status of customary and statutory laws relating to land and resource tenure has led a number of African states to revise land laws. At least 9 Sub-Saharan countries, including Uganda and Tanzania, are in this process, and many of the issues are similar, including the:

- Role of the state in land ownership and control,
- Future of traditional forms of land ownership,
- Extent to which land regulation should be democratized, and
- The Extent to which a market in land may be encouraged without unrecoverable social cost" (*Wily, 1997 In: Barrow, et al., 2000*).

"...Land tenure cannot be separated from land use. Tenure rules emphasize human issues and regulation of competing interests in land use. Land use emphasizes human and environmental issues, and the regulation of its use to conform with acceptable methods of husbandry and conservation. Thus the holder of tenurial rights has to assume that the objectives of land use are realized. Therefore, land use decision-making is a tenure issue" (*Okoth-Owiro, 1988 In: Barrow, et al., 2000*) (*Barrow, et al., 2000*).

In the principal author's experience, true customary tenure exists only in very isolated areas of Sub-Saharan Africa where local societies have little or no contact with governments, something that is becoming increasingly rare. Often customary tenurial land and resource rights are suppressed and/or in conflict with statutory rights. Statutory land tenure appears in the following forms (*Barrow & Murphree, 1998*), which the authors believe must eventually move towards communal ownership if these natural systems are to survive:

- **State ownership.** Protected areas in Africa were usually established without the participation or consent of local people and many times involved their forced removal. Traditional tenure was replaced with "Western" state ownership. This exclusive ownership led to no community

or resource user involvement or benefit flows except through “theft” of government assets. Protected area outreach attempts to introduce the idea of broadening the tenure arrangement, therefore assuming some level of tenure rights for local communities, converted into benefits, while government retains “legal” ownership. Conservation is the primary objective while rural livelihoods are of secondary importance. Dialogue, conflict resolution and forms of benefit sharing arrangements (e.g., percentage of gate fees to community), which do not include use of protected area natural resources, are the major components of outreach. In essence, CBNRM comes under this category.

- **Collaborative or co-management management agreements.** Collaborative management represents an arrangement whereby a community or a group of resource users and a conservation authority collaborate to jointly manage a resource, certain resources or an area of conservation value. The collaborative arrangement may also be between a private sector interest and a community or a conservation authority. The resource(s) or conservation area is usually governed by national policy and legal instruments and not legally owned by individuals or local resource users, for example national parks, game reserves, certain tree species. Use will contribute directly to rural poverty alleviation, but will normally be confined to those who live relatively close to the protected area. *Gestion des Terroirs* (see Section 9.8.9, *Gestion des Terroirs*, West Africa), described below might be considered a good example of this.
- **Ownership of land and its resources.** The basis for conservation and natural resource management lies with the community or resource users. The "community" has ownership of their resources. In terms of the balance between rural people and government, government retains some rights, but normally only one of last resort. In Kenya, group cooperatives and private ranches are halfway there. They own their own land, which is

unique for Sub-Saharan Africa, but they are still fighting to take back ownership of wildlife from the state (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya and Chapter 11, Section 11.11.9, Kenya Wildlife Service (KWS) – Living on donor handouts, negative impact on Kenya's wildlife outside parks).

These areas are very cloudy. The only place in Africa where full government recognized devolution over land and wildlife exists is on private white-owned game ranches in South Africa, Namibia and Botswana. Bond, *et al.* (2004 *In: Child, B.* 2004a) believe that

“a critical limitation of early Zimbabwean resettlement models (since 2000), which mitigated against land and natural resources management as well as settler investment, was a lack of proprietorship over land and natural resources: the tenurial conditions that allowed the deterioration of communal land were simply transferred to the newly acquired private land...A necessary...condition for successful wildlife-based resettlement is that levels of proprietorship equal to or greater than currently enjoyed by commercial farmers are granted to the new owners of the land”.

Whether out of anger, seeing wildlife as a white person's prerogative or out of ignorance, many of Zimbabwe's game ranches have been devastated, with from 60-80% of the game being eliminated on these resettled farms/ranches. Zimbabwe, the initiator of private game ranches, has taken a reverse step with its radical land reform beginning in 2000 whereby many game ranches have been invaded or confiscated (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife).

Likewise, Jones (1999b) states that in Namibia (9.6.3.5 LIFE, Namibia, Nyae Nyae Conservancy)

“the conservancy approach provides communities with resource rights but not land rights. While a specified group of people gain exclusive access to the use of and benefit from wildlife and tourism on their land, they have no right of exclusion from the land itself. In many parts of Namibia a de facto open access system to land prevails - only where traditional authorities are particularly strong and government is willing to back their land allocations, is a system of exclusion possible. This has meant constraints for conservancies developing wildlife and tourism as land use options. While conservancy members might abide by conservancy land use and management plans, there is little to stop outsiders from moving livestock on to conservancy land”.

“Currently, due to the new Government's politics, ‘One Namibia One Nation,’ there is tremendous political pressure to move people from the more populated and thus environmentally degraded communal areas, as well as, Herero refugees from Botswana (Approximately 4,000 Herero refugees with 50,000 head of cattle) without considering the landuse potential/economics, and the human/livestock carrying capacity of Bushmanland” (USAID, 1992).

In 2005, while having formed conservancies and having wildlife user rights, the San are fighting court battles to prevent the invasion by Hereros who wish the land for livestock, which will certainly negatively impact wildlife (Arnold, *pers comm.*).

Rural communities in Kenya, on the other hand, have ownership over their lands but not their resources, with dire consequences for wildlife as they opt for other land uses that can provide them with income (see Chapter 5, Section 5.7.1.3 Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya and Chapter 11, Section 11.11.9 Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact on Kenya's Wildlife Outside Parks).

In Sub-Saharan Africa, at the beginning of the 21st century, in most countries, critical wildlife areas and the wildlife itself is still owned by the state. In fact, communal resources throughout the region are centrally controlled by the state as

discussed (see Chapter 3). Land was rapidly centralized by the state at independence with usufruct²⁵⁷ rights to rural communities that clash with traditional common property ownership where powers are vested in traditional leaders for control and access to this land (Jones & Murphree, 2004 *In Child, B.*, 2004a).

Ultimately, Emerton and Mfundu (1999) argue that for wildlife to survive, government policies must favor wildlife over agriculture as a land use, including ownership over wildlife and the right to directly benefit from its use and other resources found within the confines of its habitat, as well as in secure land tenure.

“Tenure is a critical factor for conservation, since it determines the linkages between responsibility and authority over land and natural resources, and also determines the incentive structures for sustainable use” (Murphree, 1996, *In: Barrow, et al.*, 2000).

Access to land facilitates greater access to other resources thereby providing opportunities to rural communities to improve their standard of living. In Southern Africa, issues exist over white-owned commercial land and the former owners comprised of rural African communities (see Chapter 5, Section 5.7.4, Land Reform/Redistribution without Integrating Local Communities as a Constraint to Agricultural Production; Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife; Section 5.7.4.2, Land reform and South Africa; Section 5.7.4.3, Land reform around the corner in Namibia and Section 5.7.4.4, Land reform and civil war in the Ivory Coast). Unless this land issue and its tenure can be resolved, the feasibility of CBNRM comes into question (Katerere & Chikoku, 2002 *In: WSP*, 2002). According to IUCN/SASUSG (1997), tenure enhances sustainability of CBNRM and of natural resources when:

- Rights of access are clearly defined and accepted;

²⁵⁷ Right to use but owned by someone else

- The ability to enforce those rights exists; and
- The unit of management and accountability is small and functionally efficient.

Similar to private game ranches in Southern Africa, the success of CBNRM initiatives may largely depend on legal ownership over wildlife (Katerere & Chikoku, 2002 *In:* WSP, 2002), timber, mineral and other resources where community structures obtain the majority of the benefits from partnering with the West to use their extractive technologies, while, like any entrepreneur, paying taxes to the government. It is argued that individual tenure versus communal tenure risks to see land subdivided into units that cannot support wildlife ecologically or economically. The communities should own not only the land but also the game, as on private farms in Southern Africa, as long as it is not abused. Junge (2004) concludes that resource tenure rights do not need to be private to be secure, though the authors argue that “private” can be communal instead of individual (e.g., community member shareholder run companies). Tenure rights based on membership in culturally based local groups are often more secure than those based on freehold tenure or leasehold introduced and backed by the state.

“In areas where the elders’ authority has been reduced, customary management rules are increasingly difficult to enforce (Scherr, 1989 *In:* Barrow, *et al.*, 2000). Where some authority remains, such rules can have a significant beneficial role in development and should be fostered and built upon” (Barrow, *et al.*, 2000).

Regardless, minimum economically & ecologically viable sizes of natural areas, ranches and farms, beyond which subdivision can no longer occur, must be determined and enforced – in collaboration with the owner(s) - based upon soils, rainfall, vegetation, and needs of wildlife (see Section 5.7.1, Property Rights and Land Tenure, Constraints to Soil Fertility and Agricultural Production).

A problem becomes – what is economically viable and for whom (e.g., a rich Pretoria lawyer with excess capital who is not interested in the economics, other than a tax write-off, versus a game rancher or community who must live from the resources on their land)? In many cases, as will be discussed, the resource/human population ratio around communal areas is so low that at the household level pure economics will likely not be the determining factor alone in deciding if a community will retain an area for wildlife and other natural resources. Less tangible aspects such as cultural, religious and ancestral ties to wildlife and other resources, and a feeling of ownership, may be as, if not more important in the final decision as to a chosen land use and the value of maintaining the spatial integrity of an area.

It is also not clear that in much of Sub-Saharan Africa the subdivision of land through privatization and its subsequent fragmentation is the best solution in savanna areas where wildlife and livestock may be the best land use. Fragmentation can result in the loss of complete ecosystems necessary to sustain wildlife and/or traditional lifestyles (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya). Thus, maintaining communal ownership in such cases may be the best way of assuring that land remains as both an economic and ecological unit.

“The extensive tracts of land required to support wild animal populations are being physically demarcated and split into agricultural units which threaten wildlife, for example around the Nairobi National Park dispersal area, the Maasai Mara National Reserve (Norton-Griffiths, 1996 *In:* Barrow, *et al.*, 2000), and the Amboseli-Tsavo region in Kenya (Southgate & Hulme, 1996 *In:* Barrow, *et al.*, 2000). Many land units are now smaller than the minimum viable area for wildlife populations (Howard, 1995; Mwau, 1996 both *In:* Barrow, *et al.*, 2000). In terms of communal rights to natural resources, it is important to understand the heterogeneity of a community, the different actors that make up that community based on class, religion, gender, origin, socio-

economic status, etc. This diversity, combined with the multiple and often mutually exclusive use that can be made of natural resources, complicates the equitable distribution of rights of access in terms of who, when, how much, and what? (Fortmann, 1987 *In:* Barrow, *et al.*, 2000) However, community control over natural resources, both directly and indirectly, has a number of advantages, including that:

- Natural resources can be managed as a whole and the use can be spread over a wider area;
- Natural products can be distributed more equitably across the community.
- The community can use the area as an asset to meet its needs;
- The community may be better able to protect the natural resources against incursions from outside (Fortmann, 1987 *In:* Barrow, *et al.*, 2000); and
- Within a communal access system, there may be mixed and varied individual rights to natural resources, which can be better regulated by the community than by government” (Barrow, 1996).

On the other hand, chopping up formerly white-owned ranches, often marginal for agriculture, into small subsistence plots will only solve land hunger for one generation. Then the rural community will be back to square one, facing degraded land, poverty and more land hunger. It is doubtful for a number of reasons based on the experiences of economies of scale that rural economies based on subsistence agriculture will be able to produce enough food to feed the increasingly urban centers (see Chapter 5, Section 5.7.5, Food Security and Urbanization in Sub-Saharan Africa). Reallocated ranches located in environments unsuitable/marginal for agriculture need to be managed as economic and ecological units for wildlife and/or livestock as are communally managed cooperative ranches in Kenya. As George Pangeti of the Zimbabwe Parks Board explains (*pers. comm.*), the issue of land reform in Zimbabwe was passé in 2004. Today the issue is appropriate land use. Bond, *et al.* (2004 *In:* Child, B. 2004a) believe that where land redistribution and resettlement occurs, be it in Zimbabwe or elsewhere in Sub-Saharan Africa, where wildlife is the best

land use, one of the biggest challenges will be to avoid land fragmentation resulting in unviable land sizes to economically and/or ecologically support wildlife. In much of Africa, the best land use is wildlife, which can be considered a form of agriculture/”game” ranching/farming – something that many Western donors and NGOs have a difficult time dealing with and accepting. As discussed in Chapter 5, trying to turn this marginal land into a breadbasket is a pipe dream and can result in serious habitat and soil degradation in many savanna areas that comprise 70-75% of Sub-Saharan Africa, where fallow agriculture is disappearing. Wildlife must be recognized internationally as a major land use in Sub-Saharan Africa and rural Africans must be helped in managing this land use to meet their needs.

Conflict between state and customary tenurial rights poses one of the biggest challenges in determining ultimate land use. In fact, as has and will be shown in numerous case studies, keeping land/resources under state ownership is often a recipe for communities opting out of wildlife as a land use. State tenurial rights are written down, while customary rights are oral and handed down from one generation to the next. Tenurial issues involve not only land, but also who has legal access to various resources, when and how (e.g., wildlife, grazing rights, fishing rights, right to collect thatch, honey, firewood, etc.) within a given geographical area. Ultimately, land and resource ownership determines use, who benefits and who has rights and responsibilities for that land and its resources (Barrow & Murphree, 1998). Most often, customary rights are ignored and overridden by statutory rights when creating parks and protected areas, with devastating effects on local livelihoods and cultures (see Chapter 3 Section 3.9, ECO-GENOCIDE and Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers). Once local social controls are lost, very often “Common Property Resources” become “Open Access Resources” which are “mined” and thus degraded. In the long-term, it will be critical for the state to recognize customary

tenure systems with their strong social controls, and to find innovative ways of integrating these systems into modern concepts of parks, hunting blocks and intensive resource management of natural resources.

“In Africa today a wide range of these different types of community conservation are functioning under different tenurial and institutional arrangements” (Barrow & Murphree, 1998).

However, over most of Sub-Saharan Africa, most CBNRM in communal areas is still quite top-down and state controlled. The land and wildlife is still owned by the state with the majority of benefits going to the state and private sector. Many outside “Western” values are being imposed on rural Africans by donor driven NGO implemented programs. Benefits are communal and are from a very narrow view of resource use (e.g., overseas trophy hunting, eco-tourism, rarely cropping) while individual entrepreneurs (e.g., traditional hunters, pit sawyers, charcoal makers, honey collectors, fishermen, etc. that tended to dominate under traditional tenurial systems (Chapter 2) have been marginalized and are still forced to access the resources clandestinely, namely “poach”. A recent study by Lindsey, *et al.* (2006) supports the retention of sustainable traditional user rights over natural resources, believing this increases the potential of successful conservation programs. For instance in the Kunene and Erongo regions of Namibia where CBNRM is practiced, natural resources provided the following benefits to households: 29% of the households (180 of 621) benefited from wildlife utilization, 19.8% (123 households) from building poles, 6.4% (40 households) from craft making using natural resources and 1.6% (10 households) from thatch grass. In the Caprivi region of 496 households, 67.7% (336 households) benefited from thatch grass harvesting, 49.3% (245) from reed harvesting, 40% (202) from building poles, 35.8% (178) from fishing, 24.1% (127) from wildlife utilization and 6.4% (32) from craft making. In the Caprivi and Kunene respectively, 69% and 84% used wildlife only for food within the household and immediate kin network, while 31% and 16% used wildlife for food and sales, mainly among the

poorer groups in the communities as opposed to wealthier segments as measured by livestock (Long, 2004).

It is only until recently that the state has begun to look at resource and land tenure issues as they apply to conservation. According to Barrow, *et al.* (2000), in East Africa, and this applies for most of Sub-Saharan Africa,

“groups and agencies involved with conservation have not until very recently become involved in the debate from a conservation and natural resource management perspective. This stemmed partly from their confidence in the nations’ conservation estates, and from the separation of conservation issues and daily national life; a flawed assumption”.

Let us hope that they are not too late in addressing this issue as many parks and protected areas in the beginning of the 21st century have become hard edged with a wave of human poverty invading them.

Decentralization Versus Devolution in Botswana

“The enabling process pursued in Botswana thus far has focused on decentralizing the right to manage and exploit the resource, rather than addressing ownership status. Local people do not get to make decisions about the size of the quota or the range of animals to be exploited; these decisions are made by the Department of Wildlife and National Parks” (Hitchcock, 2000b) (see Section 9.6.3.4, Botswana Community Trust Program).

Once allocated by government, a community quota management committee determines how the government allocated quota will be used. The local communities can retain some of the wildlife quota for traditional hunting, and/or lease some out to private safari operators as a means of gaining income or choose not to use it. The rules by which the communities operate are made by their members and their local institutions in conjunction with district authorities and the Department of Wildlife and National Parks. Certain members of the community feel that the hunting quotas restrict their access to wildlife compared

to the past when they could hunt freely during the days of “special game licenses” that allowed a more liberal and uncontrolled access to game through “traditional hunting rights” (Hitchcock, 2000b). Devolution appears a long way off. If and when communities have enough university-trained graduates, they may be ready to negotiate management of their own resources. Until then, the evolution of CBNRM will be stuck in Stage 3 with decentralization through co-management with government as opposed to true devolution: Stage 4.

Although the following is a separate policy issue, it is nonetheless linked to land and resource tenure (as is discussed in Chapter 11, Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana). European subsidies of beef, accepted by the Botswana government, have given a temporary and artificial comparative advantage to cattle over wildlife resulting in short-term gain for a small elite. This has meant a major decline in wildlife and degradation of habitat. Some day, when these subsidies end and wildlife once again becomes the comparative advantage, the game populations will not be there to be taken advantage of by rural communities.

9.7.3 Failure to Integrate Cultural Ties towards Wildlife into CBNRM

“Conservation appears to be dependent on a complex and dynamic interaction between cultural values, livelihood issues, human relationships and economic benefits” (Junge, 2004).

“Redford and Stearman (1993 *In:* Lyons, 2000) state that biologists involved in conservation often ignore indigenous people's concerns in conservation dialogues. They sometimes claim to represent the interests of indigenous people without having the mandate or authority to do so. When programs fail to integrate traditional management practices and ideas, they are unlikely to benefit rural people (Lohmann, 1991 *In:* Lyons, 2000)...Even though indigenous communities may at one time have had effective systems for sustainable use, the social, economic, and technological foundations of those systems are often eroded or completely gone, and present-day communities are often less

concerned and equipped to conserve their resource base. The modern variants of traditional practices often do not meet the needs of growing populations and increasing aspirations (Redford & Stearman, 1993 *In: Lyons, 2000*)” (Lyons, 2000).

9.7.3.1 Spiritual, cultural and religious values often ignored in favor of monetary rewards

“Under most community-based wildlife initiatives, local people are expected to forgo their ‘opportunity costs’ of living with wildlife together with their ‘traditional access rights’ in exchange for strictly economic benefit schemes generated by wildlife uses by outsiders. Whereas many agriculturally based rural communities may accept the economic values attached to wildlife, other sources of security such as maintaining and consolidating significant social relations through mediated resource distributions are also important” (Marks, 2001).

Sustaining these resource networks while perpetuating cultural and social identities are central concerns for the survival of many small-scale communities in difficult environments (Anderson, 2001 *In: Marks, 2001*). Mayaka (2002) discusses failed delivery of promises, insufficient incentives and lack of power devolution resulting in ineffective state protection against encroachment, hostility of local populations and loss of biological diversity. He speaks of the importance of non-financial incentives such as democracy, pride and sense of ownership being overlooked for cash or in-kind incentives. “When prevailing conditions hinder their livelihood security, populations are likely to resort to subversiveness as a survival strategy” (Mayaka, 2002).

CAMPFIRE seems to have no capacity to deal with the spiritual dimension of conservation and natural resource management, failing to contribute to rebuilding indigenous knowledge and reintegrating it into conservation management (Sibanda, 2004 *In: Fabricius, et al., 2004*). It can be argued that this tends to be a serious flaw in most CBNRM programs.

In simple terms, wildlife alone will not provide enough “meat and money” or materialism to change peoples’ attitudes towards wildlife (see Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa). However, it is possible that what will be critical to saving wildlife and its habitat will be giving back to rural Africans their spiritual, cultural and religious ties to these natural systems such as access to their sacred forests, traditional burial grounds, traditional hunting and gathering rights. This also will also allow a percentage of individuals, the real entrepreneurs, to earn a livelihood from the diverse array of resources within the protected areas, something that is not a normal component of CBNRM.

In Africa, giving rural Africans such rights and privileges may be more important than “meat and money”, given the ever-growing human population. Most Africans cannot even afford the luxury of visiting a park and few have seen a wild animal other than crop pests such as warthogs, hares, monkeys and birds, as they have been cut off from their resources. Most see their only future as human-made systems, especially small-scale farms that are slowly engulfing many natural areas in Africa. Working with rural Africans to allow controlled access to “their” reserves and parks to carry out long-standing traditions and to meet their daily needs may be the only way of controlling illegal and unregulated harvest of resources from these areas, or worse, encroachment by small-scale farmers and loss of habitat. It becomes obvious that the needs and perceptions of rural Africans towards conservation in parks and protected areas are worlds apart from what an urban elite, be it in Sub-Saharan Africa or the West, wants from these areas. While the needs of this urban elite (leisure, escape from the pressures of modern society) and the global community (e.g., biodiversity) are important, too much emphasis has been placed on meeting these needs. Meanwhile, up until now little or no importance has been placed on meeting the utilitarian conservation needs of the interest groups, namely rural peripheral communities, who will ultimately determine the future of Africa’s wild areas. This will have to change if

parks and protected areas are to survive the more than doubling of Sub-Saharan Africa's population in 50 years to 1.8 billion, though this change alone will not save these areas unless they fit into a bigger picture plan for development on the subcontinent, which is discussed in the Chapter 14.

In the developed world, what has saved wildlife is not just its financial value, but also our ties to wildlife as an integral part of our culture and, as in Sub-Saharan Africa, hunting has often been seen as a rite of entry into manhood and male bonding: a father taking his son on his first hunt. In America and Europe, hunting camps are all about camaraderie, breathing fresh air and communing with nature and, even for non-hunters, escaping the fast paced life in the cities. Few people in the developed world depend on wildlife for survival, but they spend large amounts of money for cultural and spiritual and many would say religious ties to nature and wildlife. This has been a key to conservation in the West so why should it not be a key in Sub-Saharan Africa? If even a few of the traditions discussed in Chapter 2 still exist, then these cultural, ancestral and spiritual ties can be used and/or built on to develop a modern "African conservation ethic" built on tradition! For instance, hunting guilds can be reinvigorated and serve like modern-day hunting clubs in America, Europe and South Africa that train hunters and steep them in the culture, traditions, ethics and laws related to wildlife as in the guilds of old.

Yet, most CBNRM programs cut out traditional hunters and other resource users from parks, hunting blocks, forests and other protected areas. Traditional hunters then have to stand by while wealthy overseas hunters and tourists come into their hunting grounds and shoot their animals. Traditional hunters perceive overseas hunters as

"privileged individuals who are allowed to break laws that local people themselves are expected to uphold and abide by" (Fabricius, 2004, *In: Fabricius, et al., 2004*).

Speaking of how important traditional hunters are in conservation and the danger of alienating them, Marks (2005 *In:* Lyman & Child, 2005) concludes that

“their overlapping domains of knowledge about place, about religion, about destiny, about environments and their resources, and about leadership roles would seem to make local hunters associates (rather than perennial devils) of conservationists. Their bushcraft and roles have persisted over time, they are capable of supplying a local product in demand, they are widely distributed in space, they regulate their numbers, and their individual distributive representations and achievements are often a means for channeling and assuming ascendancy within their respective lineages. Their skills and knowledge are useful also in protecting human lives and crops. The existence of such local processes and expertise in wildlife seems supportive of co-management regimes together with effective devolution in some decision-making. Otherwise, once disenfranchised from projects, such local actors may turn their creative energies and talents to subverting the imposed system”.

ADMADE, Zambia

When the principal author evaluated ADMADE for USAID in 1992 (DeGeorges, 1992a), a number of professional hunters (PHs) explained that the ADMADE village game scout program was built around people who could read and write. Most traditional hunters cannot count as they can neither read nor write - their school being Mother Nature rather than a walled-in classroom. The ADMADE program assumed that revenues from building schools, wells, clinics, etc. would result in decreased off-take of wildlife. Game populations would remain stable or increase within the Game Management Areas (GMAs). Marks (2001) in comparing wildlife monitoring, conducted in collaboration with traditional hunters, close to villages between 1966-67 and 1988-89 shows a 50% decrease in numbers observed with this decline continuing between 1989 and 2001. This is based on the number of game harvested over time and the time to achieve this

success. In addition, while wildebeest numbers went up between 1989 and 2001, impala, warthog and zebra numbers declined. This is attributable to the influx of people to obtain project benefits²⁵⁸ and the institutional failure of ADMADE to change attitudes of local people towards wildlife, (Marks, 2005 *In:* Lyman & Child, 2005). Although ADMADE only started in 1987, much of the damage was done through alienation of the local hunters, who could have played a major role in stopping commercial and other illegal poaching had they been made part of the solution instead of being perceived as part of the problem. Ultimately, ADMADE has failed to integrate the cultural and spiritual ties of the local people to wildlife into the management of these areas, while economic benefits as will be seen are negligible at the level of household.

The first person to study the traditional hunters of Zambia was Dr. Stuart Marks. He is well-known for his study in the Munyamadzi Corridor (Marks, 1976; 1984). He was the first to document the ties of the traditional Bisa hunter to wildlife and the role of hunting and wildlife in religion, ancestor worship and leadership within the community (see Chapter 2). Traditional hunters provide both the community and urban centers important sources of protein, while earning a living. The Food and Agriculture Organization of the United Nations (FAO) estimates that 13.4% of protein in Zambia comes from “bushmeat” (Gibson, 1999). Marks estimated that in certain parts of the Munyamadzi Corridor, the average adult annually consumed 91 kilograms (200 pounds) of “bushmeat” in the 1970s (Gibson, 1999).

In a 1992 evaluation of ADMADE for the U.S. Government (DeGeorges, 1992a), traditional hunters felt cut out by the ADMADE program. They felt that they could carry out a number of tasks from village meat provision as the government

²⁵⁸ Linked to drought and increasing elephant numbers both of which adversely impacted agriculture

run scheme was failing, serving as trackers on village game scout teams and infiltrating poachers' rings. One group of traditional hunters said,

"We feel stabbed in the heart that the white man can come from far away to hunt, but we are not allowed to hunt". Another group of hunters said, "We have a disease passed on to us by our forefathers. It is in our veins and runs in our blood". When asked what disease they had, they said, "We are hunters" (DeGeorges, 1992a).

Many modern-day sport hunters understand this instinctual drive linked to our ancestors and our cultures. As with conservation throughout Sub-Saharan Africa's history, ADMADE drove hunting underground from use of selective rifles to non-selective and often destructive snaring (Marks, 2005 *In: Lyman & Child, 2005*) as opposed to working with local hunters to devise programs that legalized and controlled traditional hunting. Conservation was being moved in the wrong direction towards Stage 1, Conservation Against the People.

"Conflict between local people and park authorities is widespread in Africa and is exacerbated by the annexation of further areas as reserves for trophy hunting. Indignation at the hypocrisy of state interventions which prohibit local hunting but allow foreigners to hunt the same areas all in the name of conservation is keenly felt" (Colchester, 1994).

However, from about the time ZAWA was formed (1999/2000) traditional hunting quotas have existed in Zambia and though the cost is low, it is often unaffordable to local hunters living subsistence lifestyles. This local hunting quota also tends to be too low, with a bias in favor of higher trophy hunting quotas that generate significant income for ZAWA (*Chomba, pers. comm.*). Thus poaching continues.

CAMPFIRE, Zimbabwe

While issuing overseas sport hunting permits to generate income from wildlife, CAMPFIRE fails to recognize the Tonga and other indigenous peoples' (e.g., Shangaan) spiritual needs for hunting that have to do with healing the mentally sick and worship. As one elderly Tonga explained,

“Our people now die from mental illness because they can no longer hunt, as this is prohibited. We are told that we cannot kill animals, such as elephants and the eland. We wonder if the white men from overseas are coming to kill these animals in order to meet their own spiritual needs or maybe to heal their own mental illness. The law forbids the Tonga from killing animals. Why are white people allowed to kill animals and we cannot? If it is bad for Tonga to kill animals, it is bad for white people to kill animals” (Sibanda, 2004 *In:* Fabricius, *et al.*, 2004).

Xaxaba San Community, Kopano Mokoro CBO, Ngamiland 32 (NG32), Botswana

Elders argue that CBNRM has replaced their traditional subsistence hunting in which only they and God were in control with a situation where they are at the mercy of the government, safari operator, global economy and regional politics (e.g., radical land reform in Zimbabwe scares away tourists from all over Southern Africa) (Madzwamuse & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004). Commercial safari operators still give preference to employing outsiders and of 15 safari lodges and camps interviewed, only one operator mentioned the local population or culture in its brochures (Damm, Lane & Bolaane, 1998 *In:* Madzwamuse & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004).

9.7.4 Ignoring Constraints in Institution Building

The cultural divide was discussed at the beginning of this chapter, and the cultural ties to wildlife have been noted in Chapter 2. As a “cookie cutter” approach to democracy (see Chapter 11) has not worked, neither will the imposition of Western CBNRM institutions on rural people.

9.7.4.1 Traditional management institutions ignored in favor of Western institutions

A major outcome of CBNRM identified by Roe, *et al.* (2000)

“is the weakening of traditional authority and institutions, representing the negative side of the institutional achievements described above. In some cases this weakening of traditional authority is the outcome of a power struggle between traditional structures and new institutions that have been developed specifically to deal with CWM” (CBNRM).

“This makes the current disconnection between the formal CBNRM of projects and the more indigenous or traditional resource management systems of the real world in Southern Africa all the more unfortunate...But until the challenges of enhancing informal resource management systems are tackled, the livelihood benefits that CBNRM initiatives achieve for this region will be limited” (Turner, 2004 *In:* Fabricius, *et al.*, 2004).

Jones and Murphree (2004 *In:* Child, B., 2004a) conclude that many of the legal institutions sanctioned by governments and pushed by governments, Western NGOs and donors [e.g., trusts, communal conservancies, communal property associations (CPAs), Wildlife Management Areas (WMAs), Section 21 companies, etc.] under CBNRM that can enter into formal contracts with the private sector run contrary to the customary or informal constitutions that operate

in communities and are in conflict with the systems of decision-making in communities that are based on negotiation and consensus-building.

The institutional systems (e.g., trusts, section 21 companies, conservancies, etc.) imposed on rural communities tend to be designed by Westerners (e.g., whites) and/or African governments influenced by Western norms and standards. These institutions are often very complex and unwieldy, requiring highly trained people with accounting, management and marketing skills among others that currently do not exist in most rural African communities.

Traditional management systems are too often ignored in favor of Western systems imposed on rural communities. On the other hand,

“probably the most difficult aspect of working with indigenous peoples has been in identifying the appropriate indigenous institutions through which to mediate with outsiders” (Colchester, 1994).

This issue needs careful study and analysis to see where and if traditional systems can be utilized, resurrected and strengthened, so that people can relate to them as opposed to Western imposed institutions, and/or if the two can be integrated. While discussing the creation of pastoral institutions by outsiders, the following applies across the board to CBNRM,

“...When the interests of rich and poor coincide, then the poor will probably benefit more if the service is provided by an existing organization whose procedures are better rooted in the pastoralists’ own cultures, perceptions, and objectives than by new organizations whose constitutions and procedures are usually tailored to the convenience of central government’s legislation and bureaucrats...The establishment of new organizations with the assistance of a government or other outside agency may give the previously weak the opportunity to break away from the dominance of the powerful, but intervention needs to be prepared

to give continued political support, otherwise the poor will not stand up against the more powerful" (Sandford, 1983 *In:* Smith, 1992).

CAMPFIRE, Zimbabwe

Murombedzi (2003 *In:* Adams & Mulligan, 2003) states,

"Because institutional development in CAMPFIRE has taken the form of creating new 'formal' institutions, it has tended to completely ignore the preponderance of existing traditional institutions in most land and resource-management situations in many communities in Zimbabwe today"

and this has contributed to the alienation of communities from the CAMPFIRE initiative. He goes on to say that because CAMPFIRE ignores traditional rights and knowledge systems, it is informed by a centralizing and modernizing ethic that is contradictory to the decentralization process that is supposed to lead to community ownership over wildlife and other resources.

San of Xai/Xai, Botswana

Hitchcock (2000b) states that

"some of the people (San) of /Xai/Xai (Botswana) expressed the opinion that the kinds of institutional arrangements being proposed by the Botswana government and its advisors were too complicated and unwieldy to represent the stakeholders properly. As they put it, 'These are highly bureaucratic institutions.' What they wanted instead, they said, were institutions based on existing traditional resource management bodies (e.g., the *n!ore kxausi*) which have local legitimacy and are recognized as being responsive to the needs of community members. In 1997, it was noted that some of the members of the /Xai/Xai Trust were arguing in favor of using the *n!ore kxausi* (the territory owners/managers

for the community) both as sources of information and as managers of the resource base”.

Makuleke Community, South Africa

Koch (2004 *In: Fabricius, et al., 2004*) argues that the Makuleke community, who since 1996 own and co-manage the 25,000 ha of the northern Kruger National Park, have successfully merged traditional power structures with new democratic institutions.

Namibian Conservancies

Prior to conservancies, conservation authorities allocated a hunting quota to communal areas, the permit being issued in the name of the local headman (a part of traditional authority) who determined how the quota and benefits from wildlife would be distributed, along with customary laws (see Chapter 2, Section 2.1.3, Controlling Access to Wildlife Through the Chief, Section 2.1.3.1, Royal game and Section 2.1.8, Taboos as an Aid in Wildlife Management). In interviews with traditional hunters, it was found that there are already practices associated with local off-take that could form the basis of conservancy level dialogue to establish local rules and procedures for the management and access of wildlife. This would likely also apply to other resources (land, grazing rights, etc.). Today, community game guards report to the conservancy chairs, ignoring traditional authorities and customary laws (Long, 2004). Long (2004) recommends that conservancies should work through local level and existing traditional institutions such as churches, farmers’ unions, water point committees and kin and lineage groups to assure the sustainable management of natural resources. As noted above, to what degree do traditional authorities truly represent their people versus themselves and central/regional government today? This needs answering on a case-by-case basis.

9.7.4.2 Ignoring cultural constraints in institution building

Fairhead and Leach (2003) raise concerns that these “Western installed” local institutions are often far from being democratic, often serving a village elite, while at the same time allowing the predatory state bureaucracy with its rules and regulations to intrude into and control village access to and management of its resources, these structures becoming “a microcosm of the bureaucratic ideal of statecraft” giving an illusion of working with the community.

LIFE, Namibia, Nyae Nyae Conservancy

This may be one of the best-documented examples of the problems facing institution building in CBNRM programs. Young educated Africans will have to figure out, as with wildlife management, how to integrate these Western concepts with their cultural norms. If there is to be a chance for CBNRM programs to become functional in the long run, they will have to be Africanized.

The Ju/'hoansi were able to survive in the Kalahari as nomads. With the loss of almost all their land (see Chapter 3, Section 3.8.1, Land Compression Among the Last Hunters and Gatherers, Ju/'hoansi of Nyae Nyae, Eastern Bushmanland, Namibia & Chapter 9, Sections 9.6.3.5, LIFE, Namibia, Nyae Nyae Conservancy & 9.7.2.1, Devolution through policy reform, land and resource tenure) and depletion of wild resources on which they depended, they can no longer survive in the old ways. Alternative ways of life are being suggested and have been “pushed” by aid agencies and the government: growing crops, keeping livestock, making crafts and other business including the use of wildlife and other natural resources. However, the adoption of new livelihood forms requires changes in values, attitudes, social organization and the learning of new skills (Berger, 2003).

Socio-cultural constraints that make it difficult for individuals to represent, manage and demand accountability from leaders and staff have constrained the development of a modern management “culture and ethic”. The majority of conservancy members live in small, geographically distanced, independent villages, where decisions are made locally. This makes it difficult for members to understand and take on “ownership” and responsibilities as a conservancy, requiring new forms of authority and a sense of community-wide identity and decision-making (Berger, 2003).

The concept of periodic election of office bearers is not easily accepted, as this is not a past practice in Nyae Nyae. Members seem reluctant to elect new leaders and to replace them with younger people or more women. Those who were first “elected” onto the board were already known community leaders, and according to tradition “once a leader, always a leader”, a tradition of the *n!ore kxausi* (resource area leader) in the villages (Berger, 2003). These very same issues can be seen to be constraints to Sub-Saharan Africa adopting Western democratic processes that are discussed in Chapter 11.

A misunderstanding by outsiders is in assuming that what appears to be the egalitarian society of the San peoples will easily transform into an understanding and embracing of democracy and other Western institutions based on democratic processes.

“The tradition of hunter-gatherers was to live in relatively small independent family based groups, loosely linked to other groups with whom they established exchange relationships, but with no broad political organization and unity. As the San had a relatively individualistic way of life, the concepts of representation and ‘community’ service might also be foreign. Since even today, within each village there will be a *N!ore Kxausi*, a leader who is seen as ‘owning’ that village and the surrounding geographical resource area, the idea of several villages choosing one person to

represent them doesn't make sense. Hence, it is not surprising that there are challenges of creating a conservancy as a representative, democratically run organization with community wide participation" (Berger, 2003).

Social norms, discouraging women from attending meetings and training sessions away from their husbands, have been a constraint to increasing the number of women in conservancy leadership and employment (Berger, 2003).

There is a reluctance to elect youth and/or youth are unwilling to stand for elections or to volunteer, refusing the latter as they expect payment. With the loss of indigenous knowledge and skills and limited gain of alternative modern life skills, young people in Nyae Nyae perceive few options to support themselves on or off the land, employment by the conservancy being one of the few options. The heavy demands from family and village can put pressure on salaried individuals and this may contribute to negative behavior by some conservancy staff (e.g., corruption) (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, the Big Man and "Cosmetic Democracy"). A society that resists the advancement of the individual over others is in direct conflict with modern concepts of advancement that rewards entrepreneurial effort (Berger, 2003). These very same constraints become issues in Sub-Saharan Africa's adopting of "free-market" capitalist enterprises and institutions.

Fisheries Management, Lake Malombe, Malawi

Decisions in fishing communities are taken through traditional consensus or by the autocratic authority of traditional leaders rather than through winner take all Western-style democratic processes (Donda, 2001; Hara, Donda & Njaya, 2002 all *In:* Hara, 2004 *In:* Fabricius, *et al.*, 2004).

9.7.5 Lack of Technical and Management Skills

“The success of CBNRM in Botswana, as elsewhere, will be measured in the long term by the extent to which communities are seen to be managing their land and resources sustainably. Some informants expressed concern that the Botswana program was successful in beginning a flow of benefits to local communities, but these communities had yet to begin to actively manage resources” (Jones, 1999a).

The absence of professional training still characterizes most CBNRM initiatives. A general problem for many community-based institutions is their lack of management and business skills (Barrow, *et al.*, 2000). Because rural communities lack appropriate skills, local-level organizations are ill equipped to deal with the complexities of the market, forcing them to be continually dependent on established professional monopolies (e.g., safari operators, eco-tour companies), which are often racially linked. The long market chain involves a number of middlemen, resulting in only a small percentage and inequitable portion of the product value going to the rural communities (Murphree, 2001 *In:* Baldus, *et al.*, 2001). Often, because the community does not fully understand the value of wildlife or the cost/benefits of doing business, they fail to negotiate a fair share of the net profits when this is allowed (e.g., in CAMPFIRE and Botswana, communities tender and/or auction their hunting quotas to safari operators). Although tendering and auctioning hunting quotas or even long-term joint ventures offer partial solutions, a community must still have an idea of the net worth of its product and be able to monitor the off-take to assure that someone does not come in high to get the contract and then abuse the resource to get out his/her profits.

Furthermore, communities are often given very sophisticated structures (e.g., conservancies, trusts), which require sophisticated skills by highly trained individuals that they do not have.

The kind of professional training needed by rural communities to manage these natural areas and their wildlife includes university training in wildlife management, eco-tourism, marketing, hotel management, business and accounting. In addition, post-secondary training is needed in professional hunting and tourism, guiding students through a minimal amount of formal education, but mostly through on-the-job training under an apprenticeship/mentoring program. Certain subjects can be mastered through short courses or workshops, but they are very few. Education is a series of building blocks and a number of years are required to develop the knowledge needed to run a community-based organization, undertaking budgeting and manpower allocations, while keeping decisions and finances transparent and one's actions accountable to the membership. One cannot become a wildlife biologist nor have the skills to thoroughly analyze monitoring data statistically as a means of making management decisions unless tertiary education is provided. Though many rural Africans are good hunters and naturalists, it can still take a few years of apprenticeship as a safari operator/professional hunter or tourism operator/guide to learn the other side of these professions, namely entertainment, relating to other cultures, camp management and cuisine and, most importantly, marketing.

Unfortunately, until today, few if any youth from rural Africa have been sent off for such education either by the private sector or by donors who have spent 100s of millions of dollars in such efforts. One has to ask why? The only answer the authors can come up with is similar to the arguments on “devolution”, namely that governments, safari/tour operators and NGOs, all of whom live directly and/or indirectly off the resources, want the upper hand. How best to keep the upper hand than by keeping the landholders, the rural communities, in a state of backwardness in which they lack the technical skills in addition to having little or no understanding of the value of their wildlife resources. Lacking this

knowledge, they are prepared to work for a pittance, and/or allow the majority of the benefits to go to the government and safari/tourism operator. In the case of the NGOs and safari/tour operators, educating rural Africans at the tertiary level might result in them working themselves out of a job!

The few that have been sent off for tertiary training (university) by Western donors often received inappropriate training in America and Europe to learn temperate instead of tropical climate management techniques and to be indoctrinated into eco-colonial “protected area management concepts”.

Murombedzi (2003 *In:* Adams & Mulligan, 2003) states that wildlife utilization under CAMPFIRE is racist and obviously alienating and humiliating for local populations, the safari industry being dominated by whites and there being very little participation by blacks in the skilled worker categories (e.g., as professional hunters, tour guides, safari and tour operators – that is owners of companies, and administrative management of such companies). The majority are “boys”, tent boys, cooks, trackers, gun bearers, skinners and mechanics. As noted in Chapter 2, the success of the hunt often depends on the skills of local hunters hired as trackers and gun bearers. However, they are paid the wages of unskilled labor, well below that of the professional hunter. When the day ends, those brave and skillful men go off to eat with the other laborers, not being given the honor and dignity that should be accorded them of dining with the client. This is typical throughout the hunting camps of Sub-Saharan Africa (see Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders). THIS HAS TO CHANGE! The West had better wake up to the fact that if hunting and tourism are to survive in Sub-Saharan Africa, there will have to be a lot more Africans involved as active

company owners.²⁵⁹ A major exception is Namibia, where a concerted effort is being made by the safari industry to train trackers and skinners as professional hunters (they are already better at tracking than 99% of the professionals) – yes, the safari and tourism industries will become Africanized and the basis of this process will be through education. This very much scares many safari and tourism operators, NGOs and other “middlemen” who are taking advantage of Africa’s backwardness.

Formal training of rural Africans in nature conservation/wildlife management is critical to providing them with an understanding of the management, value and political issues associated with wildlife.

Mid-level training can be obtained in Africa’s classical wildlife colleges such as Mweka in Tanzania and Garoua in Cameroon, along with the more recent Southern African Wildlife College. However, these institutions need to move away from their colonial roots of training paramilitary forces to fight rural communities. The philosophy of these schools and their curriculum needs to be redesigned to train wildlife extension officers and ultimately community members to sustainably management the multitude of wild resources in their areas, not in cutting them off from survival!

²⁵⁹ Not as in Zimbabwe where in the 1990s safari operators were required to take on 50% partners, connected politicians and businessmen who were absentee partners collecting their percentage of the profits for the use of their name, but not actively participating in the running or learning of the business (SCI African Chapter, 1996; SCI African Advisory Board, 1997). Likewise in Tanzania, politically connected individuals often obtain hunting blocks and then sublease to white expatriate safari operators, picking up a paycheck as absentee landlords, with little or no idea if wildlife is being used sustainably. Having no vested long-term stake in Tanzania let alone the hunting block, there are a number of instances of subtenants shooting out an area and then moving on (SCI African Chapter, 1996). There is thus virtually no Africanization of the safari industry. Most of these politically connected black elites are from outside the hunting area and have no real interest in helping rural communities develop and eventually run their own wildlife business. In fact that is the last thing most of them would want to see happen. One could argue that these black elites, in the eyes of local communities are foreigners who might as well be a German, Frenchman, American, Spaniards or Englishman exploiting these resources.

On a positive note, Kahana (*pers. comm.*) states that at the Mweka Wildlife College, Tanzania, prior to 2000, the majority of students were funded by Western donors and a few by African governments. Today a high percentage of the students are privately funded from individuals to private safari and tourism companies. Statistics provided by Kahana (2005a) indicate that during the 2005/6 enrollment at Mweka, private entities sponsored 64% of the 85 first year students, 49% of the 59 certificate students, 89% of the 27 advanced diploma students, 20% of the five post-graduate students and 100% of the seven special course students. Unfortunately, Kahana (2005a; 2005b) indicates that of the Tanzanian private sector only Robin Hurt Safaris (hunting and eco-tourism) and African Environment Safaris (eco-tourism) funded one student each. Subsequently, the hunting companies of Robin Hurt Safaris, Danny McCallum Safaris, TGT Safaris and Tanzania Big Game Safaris funded one student each (Kahana, 2005c). The remainder of the private sponsors are overseas hunters and tourists, mostly Americans who meet up with youth working for the safari/tourism companies and decide to sponsor them. Graduation from wildlife colleges like Mweka or Garoua should prepare a person for a university level education and/or to work as higher paying skilled labor in the safari/tourism industry – possibly to even apprentice as a professional hunter (PH), though most PH's lack university degrees.

Tertiary education should be in Sub-Saharan Africa, by Africans about African ecology and management systems. Currently, the best and most cost-effective schools are in South Africa, which has knowledge gained by taking 300-500 years of Western resource management concepts and adapting them to African flora and fauna. Ian Parker (2004) clearly spells out this knowledge in the statement,

“White South Africans know more about managing their indigenous fauna than any people on this planet”

and it is precisely this knowledge that needs to be transferred throughout the subcontinent by sending youth to study nature conservation in South Africa's

universities. Initially, one of South Africa's roles, through the New Partnership for Africa's Development (NEPAD) should be to educate people from the rest of Africa, eventually linking to other tertiary institutions on the continent and bringing up their standards of education, which have declined drastically since independence.

As discussed in an earlier part of this chapter, the next step after returning to their communities will be for educated rural Africans to integrate this "Western" training into traditional knowledge and management systems, taking CBNRM to the next level.

Ultimately, the core objective of CBNRM is increased communal capacity for adaptive and dynamic governance of natural resource use, in which local capabilities are developed to handle change and negotiate the human impact on nature from past to present. Professional science can help them do this with the pre-conditions that local communities have 1) the right to plan, 2) the right to implement in their own manner, 3) the right to make mistakes and 4) the right to correct them. Professional science can then provide training, decision support and facilitation (Murphree, 2001 *In:* Baldus, *et al.*, 2001).

The above is said with one caveat; building capacity does not replace the need for full devolution of resource and land tenure to local communities. Child (2005 *In:* Lyman & Child, 2005) raises concern that because governments are reluctant to relinquish power and control over resources, capacity building is the CBNRM entry level by many Western donors and NGOs in the hopes that communities will eventually demand devolution. On its own, capacity building will not radically alter the political-economic status quo, at least not in the short-term. It could however, provide educated youth from rural areas prepared to fight for resource and land tenure of rural communities.

9.7.5.1 CAMPFIRE, Zimbabwe

What should be asked is why the CBNRM donor driven projects such as CAMPFIRE, which spent about US\$ 50 million over 12 years (Sparrow, *pers. comm.*) has to the authors' knowledge not sent one person from the rural communities off for university training, when most evaluations admit there is a need for capacity building? Are they afraid of building up a critical mass of educated Africans who could say, "Thanks for your help but you white boys and girls from America and Europe, well we don't need you any more. We can solve our own problems and find our own solutions to conservation and development. Thanks but no thanks! You can go home now"! Is that why we are not seeing more youth from these rural areas being trained at tertiary institutions by these Western Donor, Western NGO run conservation programs?

The first two Shangaan students who were sent abroad, Joseph Mundawu and Simon Steyn from Chiredzi in southeastern Zimbabwe, returned to their community at the end of 2003 from diploma studies in nature conservation at the Tshwane University of Technology (TUT), South Africa. Overseas sport hunters funded them. The major efforts up until now by NGOs such as WWF/Zimbabwe and ZIMTRUST have been short courses. To the authors' knowledge, no youth have ever been sent off from the hunting areas for university training by either the donors or safari operators, or apprenticed as a professional hunter. According to Abraham Sithole (*pers. comm.*), CAMPFIRE Association second vice-chairman and Chiredzi RDC indicated that arrangements are being made for these two students to become safari operators, the issue being finding an older "mentor" safari operator willing to train them and the rural community. The current political situation in Zimbabwe makes achieving this goal very difficult. As one of the students wrote to the principal author,

“The economic situation here is the worst in history, no employment, no investment in the country. There is a food crisis. The one and half years that I have stayed here at home have made me one of the poorest men” (Steyn, 2005). Upon telephoning the author, one of his first utterances was, “We are starving to death down here”.

Thank you President Mugabe! It is now 2008, and both students have fled the collapsed Zimbabwe economy to South Africa, pursuing further studies in nature conservation.

9.7.5.2 ADMADE, ZAMBIA

Since the development of ADMADE/LIRD programs in the late 1980s, to the authors' knowledge, no youth from the community hunting areas have ever been sent off for university training or apprenticed as professional hunters by either the donors or safari operators. A proposal by safari operator Ronnie Sparrow of Fair Chase Safaris operating the Nyampala hunting camp, who lost out to Tudor Jones in the Munyamadzi Corridor back in the early 1990s, planned to train at least one of the traditional hunters in the area as a professional hunter.

9.7.5.3 Tchuma Tchato, Mozambique

The Ford Foundation (Nimpuno, 2003) has funded two MSc. and one post-graduate diploma at the University of Natal in Pietermaritzburg, five diplomas and three certificates from the Southern Africa Wildlife College in the Kruger Park in South Africa and has held several short courses in English, computer skills, aerial survey techniques and CBNRM in Zimbabwe. It is believed that this training was given to government as opposed to the community, since, as noted above, this program has been used to consolidate government power at the local level. The safari operator, who, as noted, sold his company in 2005, at one time promised to identify and send off a youth from his area for university training, but this did not happen. It does not appear that money generated from the natural

resource base (e.g., income to the community from hunting) has been used for educational programs.

9.7.5.4 Cullman Hurt Community Wildlife Conservation Project, Tanzania

To the authors' knowledge, no youth from the hunting areas have ever been sent off for university training by either the donors or safari operators. In fact, the first student whom Robin Hurt Safaris is sending off, a former employee, Gladys Lendii, a Maasai woman, is being sponsored by the Shikar Safari Club (overseas sport hunters).²⁶⁰ She studied nature conservation at the Department of Nature Conservation, the Tshwane University of Technology (TUT), South Africa in 2004. Previously, Safari Club International (overseas sport hunters) sponsored Edward Mbarnoti for the same education at the same institution. He is back in Southern Maasailand working with a Maasai NGO, and in 2007 will begin his B-Tech at TUT.

Currently, few in the communities have the ability to manage benefits coming from hunting. Sally Capper, project director, (2001), agrees that the responsibility of the funds from the Cullman Hurt program should be with the villagers. The catch 22 is that at times corrupt village officials do get caught but usually after the money has disappeared.

“Our problem is that we have to show that we have put good effort into Community benefits. We get more and more pressurized every year. It's no good saying 'well we gave them the money, it's now their problem.' We are expected to produce positive results and have something to show at the end of each year”.

²⁶⁰ As noted earlier, since then Robin Hurt Safaris has sent 1-2 students off to Mweka Wildlife College, Tanzania so the idea is beginning to take hold as other safari operators join in.

Her idea is to train people in bookkeeping and basic accounting. In many places the Cullman Hurt program hands out cash for specified items and this money is taken back to the villages for payments and purchases. Making things as transparent as possible, the Cullman Hurt program informs as many people as possible of how money is spent, so that the “people” become the watchdogs over wildlife.

“In the end, we can't baby-sit eternally. It has to be the community's. It's an easier option for the villages to have us look after the money and to be responsible, as it takes pressure off them”.

Ms. Capper would like the Wildlife Management Areas (WMAs) to come online so that their institutions can be handed this responsibility, but she is concerned that they are still a long way away from full implementation. However, the communities will need to develop trained members and the institutional capacity to run the WMAs, including managing wildlife, negotiating joint ventures with tour and safari operators and/or setting up their own companies and handling finances in a transparent and responsible manner. Once again, it is believed that tertiary training of youth from the area will be key in the long-term success of WMAs as with most programs of devolution.

On the one hand, functional WMAs may not be in the interest of the private sector or government. On the other hand, creating WMAs without appropriately trained community personnel could be equally catastrophic, setting this process back for years. Education is thus critical in parallel with adoption of appropriate policies such as the WMA process. This is an issue across the subcontinent.

9.7.5.5 Botswana Community Trust Program

Matota Teko of the Yei tribe and Boipuso “Killer” Mangurunga of the Hambukushu tribe, both from the Okavango Community Trust, returned to their communities at the end of 2004 after studying nature conservation at the Tshwane University of Technology (TUT), South Africa. Safari Club International (overseas sport hunters) sponsored them. They are both working for the trust as general secretary and treasurer respectively.²⁶¹ In 2005, Tlhokomelang Ngaka, the first San woman to study nature conservation at a tertiary level returned to her people the //Anikhwe River Bushmen in Ngamiland, while continuing to study for a B-Tech at TUT. American sport hunters have sponsored them all. To the authors’ knowledge, no youth from the hunting areas have ever been sent off for university training by either the donors or safari operators.

9.7.5.6 LIFE, Namibia, Nyae Nyae Conservancy

To the authors knowledge, LIFE, which spent US\$ 25 million²⁶² over 12 years with still another five years of funding to go (Weaver, 2003), has never sent anyone off for university training from Nyae Nyae Conservancy. Currently, in the Eastern and Western Bushmanland conservancies, one student – the first San to study nature conservation at a tertiary institution (university), Paulus Arnold, returned from the Tshwane University of Technology, South Africa, at the end of 2003, having been sponsored by Safari Club International (overseas sport hunters). He is working as an assistant land use planner and nature conservationist for his community N≠a Jaqna Conservancy, Western Bushmanland.

²⁶¹ Boipuso “Killer” Mangurunga, Hambukushu, Gunotsoga Village, Okavango Community Trust, Botswana, initially employed by the trust is currently serving ten years in prison for getting an under-aged girl pregnant and refusing to marry her.

²⁶² Jones (1999b) indicates that USAID provided US\$ 14 million between 1992 and 1999 for the LIFE Project.

Hitchcock, (9n.d), explains the following goals of capacity building by the Namibian LIFE Project,

“A central feature of the LIFE Team approach is its commitment to the sustainability of the CBNRM program after the LIFE Project is over. The strategy is to build institutional capacity to monitor and maintain the natural resource base, strengthen the development of local and regional expertise in CBNRM, assist the participating NGOs, Community-Based Organizations, and communities to develop plans for shifting the financing of recurrent costs to the income generated by the community-based activities, and work out strategies whereby program efforts can increase the well-being of people over the long term. Several strategies are being employed by LIFE in its efforts to promote sustainability. Some of these efforts include (1) Employment of Namibian counterparts for expatriate positions, with the expressed objective of transferring skills and providing on-the-job training; (2) Recruiting local or regional consultants whenever possible, recognizing the considerable talents available in the public and private sectors; (3) Utilizing local and regional institutions to provide short-term training; and (4) Involving GRN (Namibian Government), NGO, and CBO staff in exchanges with other organizations in the region, thereby broadening their experience and providing opportunities for networking and forming collaborative relationships”.

It never mentions selecting youth from the rural conservancies and sending them off for university or other advanced training (e.g., hunting guides)! It never talks about having local people trained to be wildlife/protected area managers, to run safari and tourism operations or to be professional hunters. Why?

After spending millions of dollars of donor money, it is not evident that any individual has ever been sent for training at this level by the USAID LIFE project, although money has been invested in many workshops and short courses. To the authors’ knowledge, no youth from the hunting areas have ever been sent off for university training by other donors or safari operators. In 2003, the Working Group of Indigenous Minorities in Southern Africa (WIMSA), based in

Windhoek, was sponsoring 11 San students from Namibia and Botswana for tertiary education (Thoma, 2003a). Likewise, Volker Grellmann of the Eagle Rock Hunting School in collaboration with the Namibian Professional Hunters Association (NAPHA) is training trackers and skinners from game ranches as hunting guides, which is their first step in professional hunting:

- **Hunting guide**, which is the entry phase limiting hunting to the farm on which the hunting guide is employed;
- **Master guide**, which requires a minimum of two years of hunting guide experience, permitting the master guide to hunt on his farm plus two other properties;
- **Professional hunter**, which requires two years of master guiding and/or two years of full apprenticeship in a safari company, giving hunting privileges on all hunting land where landowner permission is acquired; and
- **Professional hunter-big game**, which requires a PH license, passing an additional examination focusing on dangerous game; in the future a two-year big game apprenticeship is envisaged.

They must be lauded for this pioneering effort of which the governments and professional hunting associations in Sub-Saharan Africa should take notice. Mr. Grellmann and NAPHA's next step must be to move into the communal areas.

9.7.5.7 SCP, Tanzania

To the authors' knowledge, the Selous Conservation Program (SCP) has only ever sent youth off to the national Community-Based Conservation Training Centre, Likuyu SeKhamaganga, Tanzania (Baldus, *et al.*, 2003). Two courses are offered there, catering for people from rural areas with primary education:

- A village game scout training course, which focuses on practical fieldwork; and
- A community-based conservation training course for village leaders, natural resources committees and community-based organizations.

These tend to be one-month short courses. To the authors' knowledge, no youth from the hunting areas have ever been sent off for university training or to Mweka Wildlife College by either the donors or safari operators.

9.7.6 Getting the Economics Right

9.7.6.1 Revenue streams directly to communities

At present, most revenues derived from wildlife are collected by the state and then only a small percentage of this is passed on to the communities. This creates conflict and demotivation. There is a strong risk that the resources are still perceived as "open access", controlled by the state. It is better for the community enterprises to be paid revenues directly from the sustainable use of their natural resources and then be taxed on these revenues. This promotes fiscal clarity and accountability. Receiving revenue directly from the harvest of the resource should help develop a feeling of ownership of the resource as "common property" and thus stewardship over its security/survival.

ADMADE has a centralized revolving fund, which, as described, does not work (see Sections 9.5.2 and 9.6.2.2, ADMADE, Zambia). The Wildlife Division of the Tanzanian government collects revenue from hunting and, as described, passes on the "25% retention fund" to local government with little or nothing getting to the producer community (see Sections 9.5.3, Cullman Hurt Community

Wildlife Project, Tanzania, Section 9.6.3.6, SCP, Tanzania and Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa, SCP, Tanzania). CAMPFIRE is similar. A mid-term evaluation of CAMPFIRE in 1998 by USAID estimated that only half of the Rural District Councils (RDCs) shared revenues with the producer communities (e.g., wards and villages) (Hasler, 1999). The Cullman Hurt program keeps revenue and only allots it to communities once they have defined a project. In most cases, the communities are not given this money directly but through employment or the purchase of building materials, thus failing to learn fiscal responsibility. Funds from the *Tchuma Tchato* program in Mozambique go to the government, which used to pass the money on to the villages, but now has created another bureaucratic structure between the people and their revenue (Nimpuno, 2003).

Revenue goes directly to community structures in newer programs such as the Botswana Trust and the Namibian LIFE program. However, as is described below, there is a need for better accountability and transparency in terms of what happens to this money.

9.7.6.2 Stop taxing the full value of the community’s wildlife

The current retention of trophy fees by government as practiced in most CBNRM programs is akin to asking a farmer to pay the full value of his cow each time one is slaughtered. Under such circumstances, why would anyone want to keep cows or wildlife? The communities, as on private game ranches in Southern Africa, must not only be given land and resource tenure, but must also be allowed to keep the full revenue derived from their resources. In turn, like any company, the community-owned safari companies being suggested can pay income tax like any private sector operation. By taxing the community in this manner, hopefully, they will take ownership over the wildlife just as they do with their livestock.

Baldus, *et al.* (2004) and Baldus, Kaggi & Ngoti (2004) with regard to the WMA process in Tanzania sum up the problem very clearly,

“The communities must be allowed to keep all the income from and all the fees from photographic tourism and tourism (overseas hunting) and resident hunting on their land. Why should a farmer be allowed to keep all the cash from selling a cow, but if he sells a buffalo, for which he has been given user rights, he has to share the proceeds with the Government. Instead of benefit sharing the WMA should pay taxes so that the Government gets its appropriate share too...If the wildlife remains a public good it will soon be exterminated outside National Parks and Game Reserves”,

and the national parks and game reserves will be next on the hit list!

9.7.6.3 Accountability, transparency and the creation of capitalist structures within communal systems

“Corruption and nepotism seem to be a danger in all Southern African (CBNRM) case studies where benefits have started flowing, and the fear of this might be the underlying reason for much of the intra-community conflict observed in the sub-region” (Roe, *et al.*, 2000).

For many reasons, corruption and nepotism are pervasive across Sub-Saharan Africa from CBNRM to business and governance (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, the Big Man and “Cosmetic Democracy”). The lack of good governance and accountability (e.g., outside auditing) results in little incentive to pass on economic benefits from wildlife to the rural poor (LWAG/DFID, 2002), at the level of national government, local government and even at the level of community-based institutions.

Misappropriation of funds at all levels in Africa is a problem; Westerners commonly call this corruption. In the case of Africans, misappropriating funds might be considered taking care of the extended family or the right of the “chief

and his entourage" to take the majority of the benefits. There is thus a conflict of cultures. In the purest sense, CBNRM is a form of communism in which there should be equity in sharing. Stagnating and/or declining per capita GDPs exasperate these actions.

Roe, *et al.* (2000) conclude that CBNRM

"has the effect of shifting the locus of conflict from external to internal. Communities, previously unified in conflict against a common 'enemy' in the form of the state conservation authority are now divided internally over access to power and benefits".

The reality of most of these programs, as in Russian communism, is that a few political elites (government, safari/tourism operators and NGOs), in the name of the community expropriate most of the benefits from conservation, while the majority continues to live in abject poverty with little or no opportunity for advanced education and where individual entrepreneurship (e.g. traditional hunters, fishermen, sawyers, charcoal makers, honey, thatch grass and medicinal collectors) is suppressed in the name of conservation. Ironically, it is the West, their donors and NGOs, though they fought against the idea of communism and helped to bring about the fall of the Iron Curtain, who are the strongest supporters of this communist ideology. We know that Russian communism failed and if we are not careful, CBNRM could be heading down this same road, where local communities, but especially individuals, become disenchanted because of seeing few benefits. The real question that then arises is how to structure these CBNRM institutions and what kinds of checks and balances to put into place so that they behave more like a capitalist than a communist structure?

In America today, there are examples of worker-owned companies, in which each worker has a share in the company and receives a percentage of annual profits. CBNRM might be considered as a local community owning a factory without

walls in which the product is a trophy and/or an experience. Other products from these natural areas that allow for individual entrepreneurialism are timber, charcoal, fish, thatch grass, honey, other wild foods and medicines. The African Advisory Board (AAB) (AAB, 1999) “Community Guidelines” recommend following the most advanced Botswana Model, where a community trust is created, with elected representatives from each village sitting on a board of directors that is the key decision-making body – basically a community-owned business. As has been discussed, there is no reason why a community could not choose a traditional management structure over a trust. Regardless of traditional versus modern management structure, corruption is still a problem just as it is in the West. As with any business being run for shareholders worldwide, the African Advisory Board recommends external auditing in CBNRM programs, with the results being made public to the community in order to keep everyone honest. Likewise, as discussed, a lack of trained personnel to deal with managing both the trust and the natural resources is a major shortcoming to be overcome.

Beyond this, such structures and the communities they represent must be allowed to go through various growing pains, experience and deal with corruption, learning fiscal responsibility and accountability to their constituency. This will all be part of the “growing-up phase” of CBNRM as rural African communities are brought from subsistence into cash economies. Most importantly, the governments need to let their control over wildlife go, becoming facilitators, providing decision support and monitoring the results.

The following are illustrative of what is believed to be an endemic problem in CBNRM programs in Sub-Saharan Africa.

Missing Money, Okavango Community Trust, Botswana

At the end of 2003, the two students studying nature conservation at the Tshwane University of Technology returned to the Okavango Community Trust that controls hunting/tourism blocks [Ngamiland (NG) 22 and 23]. Wilderness Safaris, an eco-tourism venture, has generated US\$ 400,000/year for the community over the last five years, amounting to US\$ 2 million. A white trust manager and a trust board, whose head is illiterate, controlled this income. On arriving, the two students and a new white manager found the bank account empty. An external audit is being conducted to determine how this money was spent and/or absconded (*Mangurunga, pers. comm.*). This example is typical throughout community programs in Africa and demonstrates the crying need for external auditing and reporting systems as the basis of any such endeavor.

Boggs (2004, *In: Fabricius, et al., 2004*) notes corruption and the lack of accountability in the Sankuyo community of Botswana.

Missing Money, ADMADE

As noted under Section 9.6.2.2, ADMADE, Zambia, approximately US\$ 1 million in the government controlled “revolving fund” was unaccounted for, and what money made it down to the community level was often enjoyed by a few, mainly those living in the chief’s village.

9.7.6.4 CBNRM will not create a “middleclass” in rural Africa

CBNRM “benefit-based models are based on an incomplete understanding of the economics of community conservation and of the nature of wildlife benefits. Over the long term, they may neither lead to community welfare improvement nor contribute to wildlife conservation. Benefit distribution is a necessary, but in

itself may not be a sufficient condition for communities to engage in wildlife conservation. Whether or not communities have economic incentives to conserve wildlife, and whether or not they are economically better off in the presence of wildlife, goes far beyond ensuring that a proportion of wildlife revenues are returned to them as broad development or social infrastructure benefit (e.g., schools, boreholes and clinics)....benefit-based approaches to community conservation are based on the economic rationale that although wildlife has a high economic value, local communities - who are often already economically marginalized - receive little of this value, and therefore have little incentive to conserve wildlife because they do not economically gain from doing so. Benefit-based approaches require that wildlife conservation simultaneously generates national benefits (which will justify wildlife conservation overall), government revenues (which will provide funds to distribute to communities) and community benefit...This requires a redistribution of wildlife benefits, which are currently balanced in favor of the people who live outside wildlife areas (tour and safari operators, government bureaucrats, national treasuries) and often outside wildlife-rich countries (NGOs, rich tourists and sport hunters). If wildlife has little or no value to local communities, there is no reason why they should conserve it" (Emerton, 1998a).

While many people support the concept of people benefiting from wildlife, very few people have looked closely at quantitative figures. CBNRM, unfortunately, has been heavily politicized in the international arena such as at CITES (see Chapter 10) and CBD, where Western animal rights and sustainable use groups fight ideological battles, in many cases without knowing the reality on the ground. In some cases, the hunting fraternity sweeps the dust under the rug and in other cases, it is spread for all to see by the animal rights groups. Neither case, placing CBNRM on a platform to be aggrandized or trying to turn it into a pariah, will help CBNRM evolve where it counts – on the ground. Very often, the total benefits are quoted instead of what really counts: household benefits. Sachedina (2006) provides an excellent analysis in the Tarangire ecosystem, where common property benefits only and the lack of benefits at the household level fails to change attitudes of the population; wildlife and conservation being seen as a

threat to land tenure and livelihoods. We need to be honest about CBNRM and what it can really hope to accomplish economically, culturally and spiritually for rural Africans, because ultimately they will decide on the future of wildlife and they must make CBNRM evolve into a sustainable process. First of all, CBNRM as currently practiced, mainly based on safari hunting, offers limited prospects for individual employment.

Meanwhile, on the ground, people are living with wildlife and are making daily choices as to whether they should continue co-existing with wildlife, regardless of the above ideological battles. We need to realize what reality is for these people and what it is going to take for them to continue living with wildlife in the long-term.

The relationship between human population densities and the abundance of resources determines the potential and viability of CBNRM programs. Less densely populated areas where the Big 5 [lion, elephant, leopard, buffalo, rhino (currently not hunted except on private ranches in South Africa, and then mainly the white rhino)]²⁶³ exist can make the difference between financial returns which are less than US\$ 1/ha without these species to as much as US\$ 5/ha which can be realized by the community²⁶⁴ when they are part of the hunting quota (IUCN/SASUSG, 1997).

²⁶³ In 2004, CITES allocated five black rhino each as hunting quotas to South Africa and Namibia (see Chapter 10)

²⁶⁴ The gross/ha accruing to the community, safari operator and government is much higher. If the community obtains a minimum of 10% of the gross (does not separate out income on private and state lands meaning percentage to community likely much higher) (Khumalo, 2005), the above amounts would increase from US\$ 10/ha without the Big 5 to US\$ 50/ha/yr with the Big 5 as a gross value for the entire industry. Similarly, Child (1995) found that the gross value of wildlife on game ranches was US\$ 10.70-11.83/ha/yr (few game ranches offer the Big 5) compared to US\$ 4.24/ha/yr for cattle, while the net value was US\$ 3.53-4.48/ha/yr for wildlife and a negative US\$ -1.42/ha/yr for cattle on game ranches in Zimbabwe.

As things stand today, in most CBNRM programs, unless the human population relative to the natural resource base is low, the one-dimensional benefit-based approach alone from “off-farm” assets such as wildlife - normally hunting revenue and sometimes tourism revenue - will not significantly improve the lives of the rural poor at the household level. Jones and Murphree (2004 *In: Child, B.*, 2004a) conclude that where the resource to demand ratio is low (e.g., scarce resources in relation to human population size), CBNRM initiatives promising the delivery of direct economic benefits are doomed, the configuration of benefits needing to be based on other values (e.g., cultural, spiritual, etc.) and/or access to more diverse resources found in the area (e.g., traditional hunting/bushmeat, fish, honey, timber, charcoal, wild medicines). Such benefits can contribute, along with agriculture, to household production schemes and can be a catalyst to development in addition to “common property benefits” from hunting such as schools, clinics, roads and boreholes. In fact, as currently practiced, it is doubtful in most cases that CBNRM will allow the majority in rural Africa to join the ranks of the middleclass. Only in Botswana, where the human population relative to the resource base is low, do household level benefits appear to be relatively substantial (Table, 9.7) and even by Western standards they are low. In most cases, even where the potential income/household is relatively high, these benefits usually go to common property development, households seeing little or no direct benefits.

As currently practiced, it is even doubtful that the common property benefits of schools (better education), clinics (better health) and boreholes (safe drinking water) from CBNRM can help make sure that children are healthy and well educated and able to compete in a global society. As discussed in Chapter 5, Section 5.4, HUNGER LINKED TO POVERTY, if a large percentage of children are mentally stunted from undernourishment/malnourishment because their families are either too poor to buy appropriate food and/or have been cut off from

accessing the diverse array of resources they need as a result of exclusionist policies of parks and protected areas, they will not be able to take advantage of even these common property benefits. Rural Africans are losing all around!

Table 9.7: Household level income from various CBNRM programs in the 1990s and early 2000s

Program	Country	Period	Number of Households	US\$/Household/Year	Major Activity	Extracted From
CAMPFIRE	ZIMBABWE	Average 1989-1999	≈95,000	18.60 Gross	Safari Hunting	Bond, 2001a
CAMPFIRE	ZIMBABWE	Average Median 1989-1999	≈95,000	6.02 Gross	Safari Hunting	Bond, 2001a
CAMPFIRE	ZIMBABWE	1989-1996	>100,000	4.5-13.4 Gross	Safari Hunting	Bond, 2001b <i>In:</i> Fabricius, 2004; Turner, 2004 <i>In:</i> Fabricius, <i>et al.</i> , 2004
CAMPFIRE	ZIMBABWE	Average		<5 Gross, <2.25, Actual	Safari Hunting	Hasler, 1999 <i>In:</i> Fabricius, <i>et al.</i> , 2001
ADMADE	ZAMBIA	1991	≈1,000 Munyama dzi only	17 Gross	Safari Hunting	DeGeorges, 1992a
LIRD	ZAMBIA	1990s	≈10,000	22-37 Gross	Safari Hunting	Child, B., 2004b <i>In:</i> Fabricius, <i>et al.</i> , 2004
Selous Conservation Program (SCP)	Tanzania	1990s-Present	≈16,500	20.60 Gross 15.84-16.12 Actual controlled by community	Safari Hunting	Hahn & Kaggi, 2001; Siege, 2001b <i>all In:</i> Baldus, <i>et al.</i> , 2001; Kibonde, <i>pers. comm.</i>
Cullman Hurt Community Wildlife Project	Tanzania	1990s	?	14.50-120 Gross	Safari Hunting	Clarke, 2001

Table 9.7 (Cont.): Household level income from various CBNRM programs in the 1990s and early 2000s

PROGRAM	COUNTRY	Period	Number of Households	US\$/Household/Year	Major Activity	Extracted From
<i>Tchuma Tchato</i>	Mozambique	1990s	≈1,863	5.90-9.39 Gross	Safari Hunting	Murphree, 1995; Nimpuno, 2003; Johnson, 2004 <i>In: Fabricius, et al., 2004</i>
Sankuyu Community Ngamiland (ND) Area ND 34	Botswana	2001	≈100	1,190	Safari Hunting	Peake, 2001
Sankuyu Community Ngamiland Area ND 34	Botswana	2000	(340 residents) ≈50 Households	4,700 Gross	Safari Hunting	Boggs, 2000 Boggs, 2000 <i>In: Fabricius, et al., 2001</i>
Sankuyu Community Ngamiland Area ND 34	Botswana	1996-2000	(350 residents) ≈22 Households	4,450 To 9,577 Gross	Safari Hunting	Boggs, 2004 <i>In: Fabricius, et al., 2004</i> Turner, 2004 <i>In: Fabricius, et al., 2004</i>
Khwai, Ngamiland Area ND18	Botswana	2000-2002	(360 residents) ≈35-50 Households	4,536-6480 Gross	Safari Hunting	Hitchcock, 2003a/11/16.; Boggs, 2004 <i>In: Fabricius, et al., 2004</i>
Okavango Community Trust, ND 22 & 23	Botswana	2000-2004	≈300-500	800-1,333 Gross	Eco-Tourism & Safaris	Mangurunga, <i>pers. comm.</i>
/Xai/Xai Tlhabolo Trust	Botswana	2002	≈39	872 Gross	Safari Hunting	Hitchcock, 2003c; 2003d

Table 9.7 (Cont.): Household level income from various CBNRM programs in the 1990s and early 2000s

Program	Country	Period	Number of Households	US\$/ Household / Year	Major Activity	Extracted From
Xaxaba, Part of Kopano Mokoro CBO, ND 32	Botswana	2000	≈15	1,667 Gross	?	Madzwamuse & Fabricius, 2004 <i>In: Fabricius, et al.</i> , 2004
Nyae Nyae Conservancy	Eastern Bushmanland, Namibia	1997- 2002	≈400	79 Gross 1998 to 2002 196 Gross in 2003	Safari Hunting	Weaver & Skyer, 2003; Thoma, 2003b
Torra Conservancy	Northwest Namibia	2002	≈120	853 Gross 363 Net for Household/ Community Projects	Safari Hunting and Lodge	Jones & Murphree, 2004 <i>In: Child, B.</i> 2004a
Makuleke Community	South Africa	2001	≈1,200- 3,333 (10,000- 20,000 people)	2,500 vs. 1,200 households: 123-256 Gross	Safari Hunting Stopped in Late 1990s in Favor of Eco-Tourism	Child, Castley, Knight, Gordon, Daitz, Johnson, Boonzaaier, Collinson, Davies, Grossman, Holden, Kiss & Fernhead., 2004 <i>In: Child, B.</i> , 2004a
				46-96 Gross		RSA Community Organizations, 2005
				27-41 Gross in 2000/2001 for 2,500 households		Mahoney & van Zyl, 2001
				35- 92/household/year for 2,500- 3,333 households		Harvey, 2006

Table 9.7 (Cont.): Household level income from various CBNRM programs in the 1990s and early 2000s

Program	Country	Period	Number of Households	US\$/Household /Year	Major Activity	Extracted From
Richtersveld Community	South Africa	2001	1,200	<50 Gross	Lease Fees Park	Magome & Fabricius, 2004 <i>In: Fabricius, et al., 2004</i>
Comoé-Leraba Game Reserve	Burkina Faso	2004	≈2,000-2,857	7-10 Gross	Safari Hunting	Principal Author
IIngwesi Lodge & Group Ranch	Kenya	1997	≈450	111 Gross	Eco-Tourism	Powys, <i>pers. comm.</i>

Note: Gross indicates total benefits divided among households. Often benefits never reach household, used for common property benefits and/or to run community organization (e.g., conservancy, trust, Section 21 company, association, etc.).

Prepared by principal author

On the other hand, it is also doubtful that “common property benefits”, which should be the responsibility of government, such as education, health care and clean water, will change people’s attitudes towards wildlife. Whether you hunt or not, your children still get to attend school, your wife still gets to use the grinding mill and your entire family can go to the clinic.

“A growing recognition that the provision of social infrastructure is not in itself a sufficient condition either to financially benefit land holders or to offset the economic costs that wildlife incurs to them (Emerton, 1998b *In: Barrow, et al., 2000*) has led to a shift in emphasis to building the capacity of landowners to develop their own wildlife based sources of income” (Barrow, *et al.*, 2000).

Thus, as currently practiced, most CBNRM programs are based on the creation of exclusion zones in which individuals and households are often poorer as a result of CBNRM because of having to forego access to the diverse array of off-farm resources from these natural systems that were a key to survival and in today’s world can be a major source of income for entrepreneurial individuals from the community. CBNRM generally ignores these opportunity costs (Emerton, 1998a) in favor of a very narrow source of benefits (e.g., eco-tourism, safari hunting) that generally benefits the community at a higher level (e.g., social infrastructure), but

places the above-mentioned entrepreneurs at a major disadvantage, often turning them into poachers. Jones and Murphree (2004, *In: Child, B., 2004a*) state that the structure of government bureaucracies, donor interests/biases (e.g., creating preservation areas) and NGO foci (e.g., biodiversity) tends to separate agricultural and natural resource issues, rather than seeing the two integrally linked, as do rural communities, as components of a livelihood system derived from a common biophysical resource.

Recent research shows that the net distribution of direct and indirect costs and benefits is highly skewed, with the rural poor receiving a very small share of benefits, while paying the lion's share of the opportunity costs of the set aside land. Poor peoples denied access to wildlife resources is often associated with a corresponding decline in access to forest resources, resulting in increased stress, fewer livelihood diversification opportunities and increased vulnerability. They found that enterprise development allowing benefit flows to individual entrepreneurs within the community could be a more effective mechanism for enterprise success than a community held equity stake (LWAG/DFID, 2002). Ideally, possibly through a community tax on the quantity of resource harvested, a percentage of net profits would accrue to the community for the purpose of developing common property benefits. This would be similar to local property taxes in the developed world that can be used to provide basic social services to the community.

What does this mean? Economic benefits from a “one dimensional benefit approach” (Emerton, 1998a), such as hunting and tourism, can play a role in changing rural attitudes towards wildlife, but must be integrated into other more abstract issues if they are to be of value. These attitudes are: 1) cultivating a feeling of ownership over the resource by rural communities, 2) integrating traditional resource users such as hunters (both auto-consumption and bushmeat),

wood cutters, fishermen, thatch grass collectors, honey collectors, collectors of animals and plants for the aquarium trade, etc. into the formal management of these resources, legalizing their access and helping them to maintain sustainable off-takes, 3) recognizing that rural Africans' religious, ancestral and spiritual ties to natural resources are different from those of Westerners, but that they can nonetheless play an important role in encouraging conservation and 4) being honest that until the majority of the gross turnover goes directly to the rural communities, even if they have to pay taxes, and not to the middlemen (e.g., governments, tourism and safari operators, or NGOs in the case of donor money) CBNRM has no chance of being sustainable and most importantly of changing attitudes! LWAG/DFID (2002) identify the failure of the majority of the wildlife-dependent poor to capture a fair share of the economic and livelihood benefits from wildlife compared to government and the private sector as a major constraint to CBNRM.

Emerton (1998a) explains that a major mistake is being made by the proponents of CBNRM in assuming that broad-based common property benefits are what communities want and need and that these benefits will convince people to conserve wildlife and its habitat without regard for the needs of individuals and their families to secure livelihoods and income from many of these wildlife conservation areas. She believes that a sufficient portion of benefit from wildlife must be captured as financial benefits - such as income, consumption goods and employment - which are received by all landholders in wildlife areas to a level, which exceeds the costs borne as a result of wildlife. In areas with a low resource to human population base, this may be difficult to achieve and such areas may ultimately give way to other land uses.

CAMPFIRE, Zimbabwe

Based on 1993 statistics, it was estimated that 70 wards in 12 districts were involved in CAMPFIRE, reaching 68,800 households or 550,000 people, which comprises 5.5% of Zimbabwe's national population (Child, 1995). Although, between 1989 and 1999, CAMPFIRE brought in US\$ 15,856,128 (Bond 2001a), which is from 7 - 8.4% (see 9.5.1, CAMPFIRE, Zimbabwe) to 10% of the gross turnover (Khumalo, 2005) only about 49.7% went to rural communities (Bond, 2001a):

- 49.70% to communities;
- 21.15% reinvested in wildlife management;
- 8.56% paid as the rural district council (RDC) levy;
- 1.90% invested in capital development projects and the RDC levy to support the CAMPFIRE Association; and
- 18.70% not allocated but retained by the RDC for the general account

After splitting this 49.7% between about 95,000 heads of households by 1999 (Bond, 2001a), it becomes relatively insignificant at that level (Table 9.8). As discussed, much of this money may not have gone directly to the households, but into common property benefits.

Hasler (1999 *In: Fabricius, et al., 2001*) estimates that the average maximum household benefit, including shared benefits, was SZW 100/household/year or less than US\$ 5/household/year. From the data in Table 9.8, this would appear to be a median income. The actual household benefit was <US\$ 2.25 (ZD\$ 45/year) (Hasler, 1999 *In: Fabricius, et al., 2001*), which also appears low compared to averages in Table 9.8.

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Table 9.8: Gross household benefits, CAMPFIRE, Zimbabwe (US\$)

	YEAR											
YEAR	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Average
Average Benefit Per Household US\$	41.33	16.52	11.62	15.87	17.01	20.35	18.54	16.99	14.80	13.65	17.49	18.60
Median Benefit Per Household US\$	19.60	6.11	5.82	5.74	4.65	2.95	5.05	4.9	3.49	2.16	5.78	6.02

Note: \$ZW/US\$/Year: 1.63/1989, 2.47/1990, 3.75/1991, 5.11/1992, 6.53/1993, 8.21/1994, 8.73/1995, 10.03/1996, 12.44/1997, 24.78/1999,
38.34/1999

ExtractedFrom: Bond (2001a) with permission, WWF

Sibanda (2004, *In: Fabricius, et al., 2004*) estimates that in 1996, farmers tended to earn much more from other activities than from CAMPFIRE. In the Nyaminyami CAMPFIRE area, the average farmer earned US\$ 34.90 (ZD\$ 350) from small stock, a goat selling for US\$ 9.97 (ZD\$ 100), while in the same year, the mean household cash income from CAMPFIRE was US\$ 5.48 (ZD\$ 55) (Sibanda, 2004, *In: Fabricius, et al., 2004*).

With the average per capita income at US\$ 460/year²⁶⁵ (BBC, 2002), the only way that CAMPFIRE can make a serious impact is through pooling the income in a given ward to provide “common property” benefits such as grinding mills, boreholes, schools, clinics, road improvements etc. In most cases, the rural population is too large for income from CAMPFIRE to make a difference at a household level. Many politicians and critics of CAMPFIRE support the use of this income for common property programs as opposed to insignificant individual household dividends (Duffy, 2000). Murombedzi (2003 *In: Adams & Mulligan*) states that nowhere in CAMPFIRE has wildlife come to represent a viable mechanism for household accumulation, though it is seen as beneficial to the extent that it subsidizes local authorities (RDCs). Only in two wards, Mahenye and Masoka, are benefits per household comparable to household incomes in semi-arid communal lands with the wildlife revenues being invested in agricultural infrastructure and equipment, which in turn have the potential to improve individual household quantitative accumulation – it is stretching the tape quite a bit to call this a success.

CAMPFIRE benefits in cash and kind (community infrastructure) at household levels are clearly related to these ratios (resource/human population) and are highest where human population densities are low and wildlife resources high.

²⁶⁵ This likely reflects a disproportional level of income made by city dwellers, the actual rural incomes being much lower. Regardless, the CAMPFIRE household income is insignificant, if it ever gets to the household.

Significant income appears to happen in wards where population density is less than 20 people/km² (IUCN/SASUSG, 1997; Murphree, 1997). This implies that at much beyond this density, habitat for wildlife is significantly reduced in communal areas, even if they abut against a core protected area. In essence, people are creating a human fence, as described by Thomson (2003), where wildlife will not go. Since hunting is not allowed in the core parks, the communal lands provide little economic benefit as there is little game to harvest and/or it and other resources are harvested clandestinely since legal access in these core areas is not part of the current “game plan”. It is interesting that the above figure is close to the 15.4 people/km² Thomson (2003) to 15.6 people/km² (Hoare & du Toit, 1999 *In:* Magome & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004) beyond which females and young elephant move out of an area, which in turn would eventually draw bulls away (see Chapter 10, Section 10.4.5, Does CITES Help Southern African Elephant Conservation?). Trophy hunting of bull elephants brings in 60% of CAMPFIRE’s income. Thus, as human population densities reach a critical number, the major source of income is lost.

In Zimbabwe, the majority of plains game (antelope) hunting was on private land (until massive land invasions beginning in 2,000): 85-90% on private game ranches and 10-15% on conservancies. Conservancies legally join together a number of contiguous private farms with common policies and practices and no internal fencing. Most big game hunting is on state and communal lands (Carney & DeGeorges, 2000). Bond, *et al.* (2004 *In:* Child, B. 2004a) estimate that hunting on private land in Zimbabwe accounts for only 20-30% of total revenue earned from hunting, the rest coming from state and communal lands. Still, plains game from the private ranches is critical to the safari industry since it is not readily available in the communal and many of the state areas. What this implies, and what most people do not want to admit, is that CAMPFIRE is not changing individual attitudes towards wildlife. While the average person may not have the

means to hunt buffalo, elephant, lion and leopard, any plains game coming out of the game reserves/parks, which the CAMPFIRE areas surround, tends to be poached and eaten (Steyn & Mundawu, *pers. comm.*),²⁶⁶ and one might ask why not if the core protected areas are maintained.

Sibanda (2004 *In: Fabricius, et al.*, 2004) states that in the CAMPFIRE areas of those interviewed, 46% had received no benefits from CAMPFIRE, only 10% thought CAMPFIRE was about sharing benefits from natural resources, 53% thought it was just about conservation of natural resources, while 18% knew nothing about CAMPFIRE.

The two school teachers from Chiredzi, who studied nature conservation at the Tshwane University of Technology, South Africa, and are among the most educated people in their community, have no idea what CAMPFIRE has accomplished in their area, while, on the other hand, being well aware of what various church groups have accomplished. This demonstrates that CAMPFIRE is badly in need of a public relations campaign and/or has accomplished little or nothing in this particular area. More importantly, since the average person has no idea what, if anything, CAMPFIRE is doing in their area, attitudes towards wildlife cannot be expected to dramatically change (Steyn & Mundawu, *pers. comm.*).

CAMPFIRE has shown that the

“state and its local level institutions that include Rural District Councils (RDCs) are not interested in sharing benefits, including sharing revenue. Their concern is to keep as much revenue as possible for their own bureaucratic emolument” (Murombedzi, 1992 *In: Dzingirai*, 2004).

²⁶⁶Simon Steyn and Joseph Mundawu, School Teachers from the Chiredzi Communal Area, and Project Noah Scholarship Students, Dept. of Nature Conservation, Tshwane University of Technology, South Africa.

Locals in Sengwe, part of the Chiredzi RDC

“think CAMPFIRE is a fraud: ‘They promised us money and motorcars, which they said, would ply the villages. To date we are stuck here in Sengwe. There are no buses. We have no motorcars or anything that resembles them, other than these homemade sandals from worn out vehicle tires. Do not tell us anything about Campfire’” (Dzingirai, 2004).

Roe, *et al.* (2000) state,

“The Southern Africa report queries whether CWM (CBNRM) does in fact have an impact on environmental awareness of local communities and cites research by Murombedzi (1999 *In: Roe, et al., 2000*) and others in Zimbabwe as evidence for this: ‘People at Masoka in the Dande communal lands invite newcomers to immigrate into their area in the hope that this will stimulate infrastructure and transport provision, knowing that the increase in population will be to the detriment of wildlife’. The people at Sankuyo (Botswana) still, after two years of a very lucrative CWM, believe that wildlife and the responsibility to manage it belongs to the state (Boggs, 2000 *In: Roe, et al., 2000*), while communities at Dwesa do not seem to be concerned about the obvious negative trends in the ecological status of mussel beds that they harvest (Timmermans, 1999 *In: Roe, et al., 2000*)”.

In addition, it may very well be that, as in many rural areas of the developing world, allowing controlled access to wildlife and other resources by the community may be more important in getting them to “buy into” wildlife conservation compared to “common property” benefits, which are not readily seen as tied to wildlife conservation. Thus, allowing local resource users as community representatives to legally harvest excess wildlife coming out of the “core conservation area”, whether officially or by default, may be one of the most important contributions to conservation that is being undertaken in the Chiredzi area. This allows desperately poor people access to much needed protein. As noted (Steyn and Mundawu, *pers. comm.*), this practice is already happening, as

any plains game coming out of the Gonarezhou National Park is killed and eaten, but with little or no monitoring to observe the effects. The next step should be monitoring this off-take and the formal integration of traditional hunting into the management of wildlife in the area, including the park/reserve surrounded by the communal area. These two students have some interesting challenges facing them on their return. Roe, *et al.* (2000) argue that

“illegal or unsustainable use of wildlife and its subsequent decline is a result of the lack of rights and responsibilities of local communities for wildlife. If wildlife conservation is perceived to be of little value to communities because of the limited, or indirect, benefits they receive from it then they will continue to use it illegally rather than to conserve it”,

although in the above case one could argue that up until 2000, by respecting the boundaries of the park and by only harvesting the overflow, they were practicing good conservation, even if illegal.

Murombedzi (2003 *In: Adams & Mulligan*) concludes that CAMPFIRE and its revenue are “carrots” that actually constitute a constraint to accumulation at the level of households, since income at a household level is insignificant, while access to resources in the natural areas and expansion of agricultural land are forbidden because of land use planning restrictions, and the tsetse fly associated with wildlife restricts livestock. However, Murombedzi (1999 *In: Roe, et al.*, 2000) also argues that

“most CAMPFIRE wards invest their CAMPFIRE revenues not to improve wildlife management and therefore increase wildlife revenues, but rather to improve agricultural productivity in ways that are incompatible with wildlife. Agricultural extension services in CAMPFIRE areas continue to be geared towards encouraging the expansion of arable agriculture, rather than realigning land use to favor wildlife production”.

Reinvesting back into and expanding agriculture could result in habitat encroachment on wildlife areas and/or in increasing conflict between farmers and problem animals, in both cases resulting in declines in wildlife.

Since many of the CAMPFIRE areas are over-crowded communal areas, until the 2000 land reform, the major areas available for expansion would have been in the wildlife areas that they border, which would have been out-of-bounds, based on CAMPFIRE agreements. Unless drastic changes are made, where communities take ownership over wildlife and many natural areas while gaining the majority of the value from the sustainable use of wildlife and other resources, many of the parks and protected areas such as the invaded Gonarezhou National Park may be in jeopardy.

ADMADE, ZAMBIA

If one takes the income from wildlife that actually reaches the head of household, it is very little. The following is based on 1991 revenue from the Luangwa Valley (Table 9.9). Estimates are made only for the Munyamadzi Corridor, for which human population estimates exist for the period over which the economic data was provided.

The average of US\$ 17/household/year that may not actually go directly to the household, will likely not change the attitudes of rural people. ZAWA (1999) is concerned that

“both the industry and the local community have seen a relatively static level of income from the safari industry in recent years. There is justified concern that these levels are not sufficient to motivate and support communities to effectively protect wildlife throughout the more than 150,000 km² of Game Management Areas (GMAs). As a result the resource base is vulnerable to

degradation and decline, thus reducing Zambia's ability to compete in the industry. Any other means of protecting wildlife in these Game Management Areas without direct support and involvement of local communities are probably unaffordable and unsustainable...In recent years both clients and industry stakeholders have expressed disappointment and growing concern over the declining quality of safari products in many parts of Zambia. This paper will show these concerns are real, represent serious threats to the future of this industry, and require strategic policy changes on wildlife use if these threats are to be overcome".

Table 9.9: Luangwa Valley Game Management Areas (GMAs) 1991 revenue retained by communities from concession fees – ADMADE program

GMA	Class Hunting Block	35% Community Kwacha	40% Management Kwacha	Total Kwacha
Munyamadzi (2 Hunting Blocks)	A	1,705,536	1,949,185	3,654,721
Lumimba (2 Hunting Blocks)	A	719,427	822,203	1,541,630
Luano	B	295,603	337,832	633,435
West Petauke	C	325,476	371,973	697,449
Chisomo	B	334,624	382,427	717,051
Refunsa	C	339,434	387,925	727,359
Chiwa-Chifunda	B	380,415	434,760	815,175
Fulasa	B	173,120	197,851	370,971
Total Kwacha		4,273,635	4,884,156	9,157,791
Total US\$		42,736	48,842	91,578
Population in Munyamadzi (Marks, 1990; DeGeorges, 1992a; Marks, <i>pers. comm.</i>)		6-8,000		
Estimated Heads of Household Munyamadzi		≈1,000		
Gross US\$/Household Munyamadzi only			17	
Note: In 1991 K100/US\$. [(1,705,536 K) (\$US/100 K)]/1,000 Households = US\$ 17				
(1) Lupande GMA not listed – part of LIRD program				
Source: DeGeorges (1992a)				

Like in most CBNRM programs, benefits tend to go towards “common property” benefits. As with CAMPFIRE, this money can best be used in community projects such as grinding mills, schools, clinics, etc. If a buffalo can generate Kwacha 4,000 (US\$ 40) for a traditional hunter from smoked meat sold on the Mpika Plateau (Marks, 1990), why should he stop hunting for a once a year US\$ 17 benefit that goes to the community and not the household, when he will likely hunt a number of animals throughout the year and may hunt for cultural and spiritual reasons as much as for monetary rewards. The traditional hunter is an entrepreneur turned into a poacher by communistic CBNRM programs driven by the West. Marx should be laughing in his grave! As a result, there has been limited buy-in by local communities as indicated by observations made by overseas hunters in ADMADE areas (Table 9.10).

Table 9.10: Summary of client perceptions from confidential questionnaire by 71 overseas hunters in ADMADE communal areas in 1998

Positive perceptions of safari hunting experience (%, sample = 71 clients)

Animal Abundance	Trophy Quality	Hunting Area	Professional Hunter	Hunting Camp	
39%	32%	37%	90%	85%	

Negative perception of safari hunting experience (%, same sample)

Land use activities:

Fishermen Disturbance	Bush Fires	Snares Found	Poaching Activity	Other Licensed Hunters	Tree Cutting	Village Encroachment
15%	17%	32%	39%	21%	25%	35%

Safari products:

Too few Animals	Poor Trophy Quality	Poor Camp	Poor Vehicle	High Fees	
13%	6%	3%	0%	23%	

Source: ZAWA (1999), U.S. Agency for International Development funded, public domain + permission, ZAWA.

This indicates that only about 33% of the clients were impressed with the trophy quality and abundance of game, while major conflicts existed with various land

uses that interfere with the normal exclusivity of safari hunting. Additionally, while on average only 6% of the GMAs have been cleared for settlement and farming, the area suitable for safari hunting is shrinking to 18% of the average GMA (ZAWA, 1999). This indicates that a combination of various resource extractions (e.g., traditional hunting, legal resident and non-resident hunting that overlap and compete with safari hunting, fishing, tree cutting, etc.) are either reducing the amount of game and/or pushing it into the least disturbed areas within the hunting block. One must ask if the development of stakeholder management plans could reduce these apparent conflicts?

The ZAWA (1999) conclusion that snaring is down due to collaborative efforts by local communities seems to be in conflict with observations by overseas hunters and the general decline in the status of GMAs to produce quality trophies (see Section 9.6.1.1, Zambia). It is furthermore in conflict with observations by Marks, who works closely with and monitors activities of traditional hunters, who provide records of how the hunting is done, at what distance from the village hunting takes place and how much effort is put in as relative indices of wildlife abundance (Marks, 2005 *In:* Lyman & Child, 2005). It is concluded that with regard to land use, disturbances from increasing human population pressures

“on the remaining hunting areas, resolving this problem is perhaps the greatest challenge the industry faces” (ZAWA, 1999).

LIRDp, Zambia

The next-door Luangwa Integrated Resources Development Program (LIRDp) targeted between 45,000 (Child & Clayton, 2002) and 50,000 (Child, B., 2004b *In:* Fabricius, *et al.*, 2004) people living in the Lupande GMA, Luangwa Valley. Prior to the creation of village action committees (VAGs) in the mid-1990s, as in ADMADE, there was mistrust by local people for the chief and the lack of

transparency in accounting for finances (Child & Clayton 2002). As in ADMADE, this devolution was initially resisted by the local chiefs. There are regular elections to the VAGs, a bank account, six-monthly audits and a high level of community participation (Child, B., 2004b *In: Fabricius, et al., 2004*).

Each VAG receives 80% of the revenue generated from the GMA (Child, B., 2004b *In: Fabricius, et al., 2004*). The remainder of the income goes to (Child & Clayton, 2002) (Section 9.8.5.2, LIRDP):

- Area development committees (ADC)²⁶⁷ 4%;
- Chiefs 6% (later they received an additional +/-2% from contingency funds); and
- Contingency 10% (reserved to employ ADC executive secretaries).

Village Area Groups (VAGs) on average allocate income as follows: 40% for common property benefits (schools, clinics, teachers' homes and wells), 10% to employ community game scouts, 40% for individual members (Child & Clayton, 2002; Child, B., 2004b *In: Fabricius, et al., 2004*) and 10% for VAG administration (Child & Clayton, 2002). Based primarily on overseas tourist hunting (sport hunting) in two concessions and some hippo culling, US\$ 220,000 is generated annually from which 20,500 adults received US\$ 5.37/person/year (Child, B., 2004b *In: Fabricius, et al., 2004*). Turner (2004 *In: Fabricius, et al., 2004*) estimates that 10,000 households receive US\$ 37.50/year gross, based on US\$ 220,000 direct revenue from leasing hunting concessions plus wage employment of US\$ 150,000. If one only looks at direct income such as wages, this may or may not be equally distributed throughout the community. If wages are discounted, the US\$ 22 gross/household/year is obtained. A single snared

²⁶⁷ "Each chief's area has an Area Development Committee (ADC) comprising between three and ten VAGs" (Child & Clayton, 2002).

impala was valued at US\$ 9.63 (Lewis & Phiri, 1998 *In:* Magome & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004), so, as noted above, with buffalo worth US\$ 40, why should individuals and/or households give up traditional hunting, the income from CBNRM in Zambia being insignificant to their livelihoods.

Cullman Hurt Community Wildlife Project, Tanzania

If cash is to be a practical option, the amount of revenue relative to the number of beneficiaries must be such that each share is a significant contribution to the recipients' pockets. If allocations for 2001 were to be given in cash to villages under the Cullman Hurt Community Wildlife Project, individual shares would have the following range (Clarke, 2001):

- Makao's allocation is \$3,377, its population 1,400; therefore shares per person would be \$2.41/year; and
- The most favorable ratio would be at Ukumbi Kakoko: allocation \$3,376, population 276 and cash per person \$12.23/year.

This would likely amount to between US\$ 14.50-120/household/year. Under these circumstances, community projects that address villagers' chief concerns (e.g., schools, clinics, grinding mills, boreholes) and problems seem a better proposition than cash shares for the foreseeable future (Clarke, 2001).

Tchuma Tchato, Mozambique

There are 11 communities or "villages" in the area with 1,863 families/households or 8,086 people living in the 2,500 km² area with a density of 3.2 persons/ km² (Murphree, 1995). Moçambique Safaris employs 15 persons in the field, who earn the equivalent of about US\$ 525 a month (assume this means US\$

35/person/month though not spelled out). Between 1996 and 1999, communities in Bawa received between US\$ 11,000 and US\$ 15,000/year from the revenues of the tourism operator in the area. In 2001, approximately US\$ 57,000 was paid to the government for trophies and license fees, of which 34.5% or US\$ 17,500 was paid to the communities (Nimpuno, 2003). Johnson (2004 *In: Fabricius, et al.*, 2004) estimates this income to be US\$ 12,000 in 1996 from safari concession fees. If the money was distributed by household, this would have amounted to between US\$ 5.90-9.39/household. To date there has been no distribution of income at the household level, though some people have argued for this (Nimpuno, 2003). Similar to other programs, money is used primarily for “common property” benefits, with grinding mills, schools, community shops and improving roads/transport to gain access to the market being priorities, among others (Nimpuno, 2003). As noted, the government conservation agents at the local level diverted much of this money for their own use (Johnson, 2004 *In: Fabricius, et al.*, 2004)

Makuleke Community, South Africa

To date, ordinary citizens have seen no material benefits from the contractual park. The collection of wild plant resources remains problematic and traditional hunting is forbidden (Reid & Turner, 2004 *In: Fabricius, et al.*, 2004). A gross income from safari hunting for the community of US\$ 50,000 translated to US\$ 10/household in 2001 (Magome & Fabricius, 2004 *In: Fabricius, et al.*, 2004). Child, *et al.* (2004 *In: Child, B., 2004a*) estimate that the Makuleke community currently earns about Rand 2 million (US\$ 308,000)/year from trophy hunting and luxury lodges are being built in this contractual park with benefits accruing to the community. RSA Community Organizations (2005) give the figure of Rand 3 million (US\$ 461,538) over four years generated from hunting for the community or US\$ 115,385/year gross. With 1,200 households (10,000 people) (DeGeorges,

1999a), depending on the figure used, this amounts to about US\$ 96-257 gross/head of household/year. If one assumes 15,000 beneficiaries or about 2,500 households as per Mahoney and van Zyl (2001), then income ranges from US\$ 46-123 gross/household/year depending on the figure used. Harvey (2006) uses a figure of 20,000 beneficiaries, at six to eight people/household. Based on the above information, this would amount to between 2,500 and 3,333 households, resulting in the same range of benefits for the 2,500 households to a low of US\$ 35-92/household/year. Agriculture and grazing livestock are not permitted.

Mahoney and van Zyl (2001) estimate that hunting revenue in 2000 earned US\$ 4.5 (Rand 35)/person/year. Anticipated revenue from hunting in 2001 was US\$ 101,912 (Rand 800,000) or US\$ 7 (Rand 53)/person/year. Assuming an average household size of six persons, this amounted to a household income of US\$ 26.75 and 41 (Rand 210 and 320) for 2000 and 2001 respectively. The CPA elected not to distribute the income, but to use it for community projects.

It is believed that as part of a signed agreement with Wilderness Safaris to build lodges, trophy hunting has been stopped (Mokono, *pers. comm.*). According to Chief Makuleke, Wilderness Safaris is anti-hunting (Harvey, 2006). It is unclear exactly how much income is being generated, but according to Mokono (*pers. comm.*) income at the level of household is very low.

Botswana Community Trust Program

Botswana may be one of the few places where the human population relative to the resource base is low, allowing for considerable benefits to local communities. The Botswana Wildlife Management Association (BWMA) has been able to provide some data as has anthropologist Robert K. Hitchcock. A key here is that even with relatively high ratios of resources to human populations and thus high

gross household benefits, little money appears as cash dividends at the household level (Boggs, 2004; Turner, 2004 all *In: Fabricius, et al., 2004*).

In Sankuyu, a community falling within Ngamiland block NG 34 of the Okavango Delta, the current annual revenues to the trust are about Pula 700,000, (US\$ 119,000), to be shared between about 100 households, (US\$ 1,190 per household) all from hunting (Peake, 2001). Boggs (2000) estimates an average income/year to the Sankuyu community of US\$ 174,167/year over a three year period from 1996-1998 for 340 villagers and US\$ 220,280/year averaging over a five year period from 1996-1998 (Boogs, 2004 *In: Fabricius, et al., 2004*) for 350 villagers.

Boggs (2000 *In: Fabricius, et al., 2001*) puts the value from wages, lease agreements, hunting quotas and levies at Pula 935,000 (US\$ 233,000) or US\$ 4,700/year/household for 50 households. However, going directly into Boggs (2000), US\$ 522,500/three years (Pula 2,090,000/three years) from 1996-1998 was made by 340 villagers, which amounts to an average of US\$ 174,167/year. If there were six to seven people/household, 50 families would be an accurate estimate or US\$ 3,843/household/year in benefits. Boggs (2004 *In: Fabricius, et al., 2004*) estimates direct financial benefits to 350 residents as US\$ 1,101,400 over a five-year period from 1996-2000 or an average of US\$ 220,280/year. Assuming 50 households benefiting, this amounts to US\$ 4,450/household/year. However, Turner (2004 *In: Fabricius, et al., 2004*) referring to Boggs (2004 *In: Fabricius, et al., 2004*), gives an estimate of 23 households, which would give one an estimate of US\$ 9,577/household/year. If the average income is about Pula 6,000 (US\$ 1,020)/head of household per year (Mangurunga, *pers. comm.*), they are significantly increasing their annual income by this additional revenue if it is distributed at the household level, a big question?

Boggs (2004 *In: Fabricius, et al.*, 2004) estimates that the Khwai Community Trust in the 1,815 km² NG 18 made revenue from selling hunting quotas at US\$ 240,000, US\$ 120,000 and US\$ 320,000, respectively in 2000, 2001 and 2002. Hitchcock (2001) places the February 2000 auction as selling the wildlife quota for Pula 1.6 million (US\$ 272,000). Hitchcock (*pers. comm.*) gives a population of 360 residents in this trust also having NG 19 of only 180 km².²⁶⁸ This amounts to an average of US\$ 630 gross/person/year over the three years. Assuming 35-50 households depending on the size of the average family, this amounts to US\$ 4,536-6,480 gross/household/year.

The Okavango Community Trust operating Ngamiland blocks (NG) 22 and 23 has opted out of hunting for the moment, but is considering putting one block out on tender for hunting in 2004. They currently net Pula 1.6 million (US\$ 400,000)/year from leasing these blocks to the eco-tourism company Wilderness Safaris that has a reputation for being anti-hunting.²⁶⁹ The trust consists of five villages with about 600 people/village totaling 300-500 families depending on the size of the families. Income from eco-tourism amounts to US\$ 800-1,333/family/year though up until now distribution to heads of households has not been practiced (Mangurunga, *pers. comm.*). In fact, as discussed in Section 9.7.6.3, Accountability, transparency and the creation of capitalist structures within communal systems, all of the income over the last five years appears to have been misappropriated - a nice way of saying stolen.

In exchange for the subleasing of some of the wildlife quota from the Controlled Hunting Areas (CHAs), the /Xai/Xai Tlhabolo Trust was promised to make as

²⁶⁸ Photographic area just below NG 18

²⁶⁹ Part of the agreement for Wilderness Safaris investing in lodges in the Makuleke community was the closure of hunting that had gone on for only a couple of years and consisted of a couple of elephant and buffalo/year

much as Pula 2,500,000 (US\$ 425,170) over two years (Hitchcock, 2003b).²⁷⁰ This would amount to US\$ 5,450/head of household/year for 39 households (Hitchcock, 2003c). It turns out that the safari operator, Bernard Horton (crossbow manufacturer), misled the community as a means of getting the hunting rights to their concession (Hitchcock, 2003b/11/16). A more realistic figure by 2002 from the safari operator was Pula 200,000 (US\$ 34,000 or US\$ 872/head of household) per year (Hitchcock, 2003d).

One of the problems with regards to work in the tourism industry is that often the San and other rural people obtain menial jobs as waiters, tent boys, etc. as opposed to company managers (Hitchcock, 2001). Education and work experience should slowly change this situation, where one day there will be local safari and tourism operators running community-owned or even individually owned businesses in the tourism sector.

LIFE, Namibia, Nyae Nyae Conservancy

Earnings by the Nyae Nyae Conservancy from 1997-2002 are contained in Table 9.11. It is estimated that there are 400 households in the Nyae Nyae Conservancy (Thoma, 2003b). Thus, average direct earnings, 100% from trophy hunting, from the Nyae Nyae Conservancy from 1998-2002 were about US\$ 48,415/year, which, if allocated at 65% to households (see Section 9.5.6, LIFE, Namibia, Nyae Nyae Conservancy, 35% operational and common property benefits), would provide about US\$ 79/household/year from 1998-2002. Additional income made by individuals is not equitably distributed, being biased towards a few households, as is employment by the conservancy, which would come out of the 35% portion of its direct earnings.

²⁷⁰ About Pula 5.88/US\$ in 2002(US\$ 0.17/Pula in Hitchcock, 2003c)

Table 9.11: Income earned by Nyae Nyae Conservancy and members, 1997-2002, Namibian dollars/US dollars

Income to:	1997 N\$/ US\$	1998 N\$/ US\$	1999 N\$/ US\$	2000 N\$/ US\$	2001 N\$/ US\$	2002 N\$/ US\$	TOTAL N\$/US\$
Conservancy	146,000/ 20,857	122,000/ 17,429	129,000/ 18,429	341,011/ 48,716	956,500/ 136,643	1,694,511 /242,073	
Conservancy plus Individuals	182,000/ 26,000	227,835/ 32,548	518,687/ 74,098	983,200/ 134,029	487,306/ 69,615	1,236,407 /176,630	3,635,435 /519,347
N\$ 7/US\$							

Extracted from: Berger (2003) with permission, WWF + financed by USAID public domain.

In 2003, the Nyae Nyae Conservancy of Eastern Bushmanland earned N\$ 845,697 in direct income, which is 100% from hunting (Weaver & Skyer, 2003), and if 65% were distributed to members, this would amount to N\$ 1,374 (US\$ 196)/head of household assuming 400 households (Thoma, 2003b). The conservancy made only two cash payments, 1998 and 1999, to households (Berger, 2003), though additional payments are anticipated in the Weaver and Skyer (2003) analysis. Weaver and Skyer (2005 *In: Osofsky, Cleaveland, Karesh, Kock, Nyhus, Starr & Yang, 2005*) estimate a per capita income of US\$ 91 (N\$ 636) in 2002 if one includes hunting concession payments, salaries from professional hunting, handcraft sales and the value of meat consumed, though this is believed to be a gross estimate and not what is actually going to individuals and ultimately, heads of households. The conservancy provided more than 50% of the per capita livelihood benefits to the Nyae Nyae residents during 2003 (Weaver & Skyer, 2003).

The conservancy is also a major provider of jobs in all four districts of Nyae Nyae and by May 2002 employed five on the management committee, eight on the game translocation boma construction crew, ten on the technical water team and one on crafts, as well as people employed by the trophy hunter (eight full time, five half time), ten community rangers and one senior field officer (Berger, 2003).

If one converts the people employed by the safari operator, this would be equivalent to 10.5 people earning N\$ 35,660/year in employment (Berger, 2003) or N\$ 3,396 (about US\$ 485)/year/person.

In comparison, employment of the workforce in tourism from 16-65 years old ranged from 3.6% in the Kunene region to less than 1% in the Caprivi region. Average annual wages of those who received direct employment from tourism were very low; N\$ 6,000/person/year (\approx US\$ 1,000-500/year depending on exchange rate) employed in the Caprivi to N\$ 9,000/person/year (US\$ 1,500-750/year depending on exchange rate) in the Kunene region. The N\$ 9,000 wage was slightly higher than the average household income of N\$ 8,000, allowing the few who gained employment from tourism to significantly improve their lives by combining this income with traditional sources such as crops, livestock, pensions and remittances. However, for the average household, the benefits were not found to be significant (Long, 2004).

Nyae Nyae's wildlife and tourism potential could increase annual benefits several fold if wildlife populations continue growing, government recognizes wildlife and tourism as the predominant land use in the Nyae Nyae Conservancy and Nyae Nyae can produce and sell high value roan and buffalo populations to markets within the disease-free commercial production areas of Namibia and/or South Africa (Weaver & Skyer, 2003).

If the conservancy can develop the capacity to manage and use funds in an accountable and transparent way, Nyae Nyae could be the third communal area conservancy in Namibia to become self-reliant (Torra was the first, Uibasen the second) (Berger, 2003). A major problem that must be addressed is that conservancies in Namibia are legally accountable upwards to government but not downwards to their constituents, conservancy members (Long, 2004).

However, to date, payouts made by the conservancy have not made a substantial difference in meeting the basic needs of the majority of people in Nyae Nyae, particularly in fulfilling the most urgent need for food (Wiessner & /AiceN!aici, 2002 *In:* Berger, 2003). The conclusions in this report are based on weight data showing that in August 2000, people weighed significantly less than in 1978, which suggests that their nutritional status had declined. Cash does not immediately translate into food production. Distribution of cash dividends, if any, provides only a short-term solution to meeting basic needs. Longer-term strategies for using funds to generate more income and/or encourage food production are needed (Berger, 2003).

Often this cash is misused. The insidious influence of Tsumkwe town, with an increasing number of shebeens (bars), means that some young people drown their frustration in alcohol and so further reduce their potential for making a livelihood. The incidence of tuberculosis (TB) and alcoholism has taken a toll on conservancy staff (Berger, 2003). Thoma (2003b) is even more critical:

“The 600 inhabitants in Tsumkwe village are enjoying the service of not less than 53 Shebeens (drinking places offering mostly home-made beer). If one includes the approx 1,800 San inhabitants of the Nyae Nyae Conservancy in one’s statistic, then about 45 people (children included) are served per Shebeen. Often the San are offered drinks ‘for free’ and therefore become easily dependent on Shebeen/shop owners. In addition, the Tsumkwe Lodge offers more ‘fancy’ drinks to people earning salaries. And of course, one can easily imagine that the earned salaries are almost spent immediately. Based on this fact one needs to pose the question if any serious development is possible under such circumstances?...Also, the local priest is involved in buying crafts from the San but paying in kind (food or old clothes), which, of course does not educate the San in understanding the ins and outs of the cash economy. Often the San sell the food and clothes to be able to buy alcohol.

In my opinion the people drink because they are bored and try to forget their poverty, which indicates that the conservancy has not yet made a remarkable positive impact on the common San's life. I would like to stress that in my view the San are not alcoholics. If they would have the appropriate assistance in earning money from the conservancy they probably would invest it in income generating activities (own shop, craft production, etc), which would improve their lives, which again would be a reason to cut down on their drinking habits" (Thoma, 2003b).

Is it not also possible that they are caught between their traditional lifestyles and the Western world epitomized by the vices and materialism of Tsumkwe, thrown out of one world (hunter-gatherer), while being ill-prepared (lacking access to tertiary education) to cope with the new world (Western global) that confronts them? As will be presented in Chapter 11 (Section 11.11.6, Eco-genocide in Southeastern Cameroon [Division of Boumba-et-Ngoko], the Forest People and the "Dobi Dobi", More Parks and Protected Areas), one sees the same problem among the Baka Pygmies, dispossessed of their forests by parks and hunting blocks.

SCP, Tanzania

The number of people living in villages around the Selous Game Reserve (SGR) and benefiting from the Selous Conservation Program (SCP) is taken from the 1998 census and is therefore only an approximate figure (Kaggi, 2002):

- Total number of people 100,000;
- Total households 16,500;
- Number of participating villages is 57 out of 90 potential villages;
- Total "income from wildlife" is US\$ 41,327/year;
- Each village would get US\$ 725; and
- Each household would get US\$ 2.50/year.

There are four sources of the above income (Hahn & Kaggi, 2001 *In: Baldus, et al.*, 2001; Kaggi, 2002):

- Wildlife meat selling in respective villages
- Resident hunters from urban areas
- Voluntary contributions from hunting block owners operating trophy hunting
- Concession fee from photographic tour operator.

For social reasons, the bushmeat is sold to villagers at below market price. Additionally, some income by individuals occurs through logging and fishing in the pilot WMAs that generates fees paid into this fund (Baldus, *et al.*, 2003).

This “income from wildlife”, as described above, is from a meat quota given to pilot WMAs outside of the SGR, managed by communities (Hahn & Kaggi, 2001 *In: Baldus, et al.*, 2001). Village quotas are normally given by the Wildlife Division and hunted by village game scouts, villages being empowered to determine monthly harvests (Ngowe, 2004). This would appear to disallow hunting for cultural purposes such as by traditional hunters and/or by individuals who may have traditionally supported their families through the bushmeat trade.

In 1999/2000, this “income from wildlife” amounted to US\$ 46,001 (Hahn & Kaggi, 2001 *In: Baldus, et al.*, 2001) or US\$ 2.79/household. Of this, 56% was used by the villages for management and protection of the communities’ wildlife areas, 16% for village development and 28% kept in financial reserves savings. Though the income is very little, it is regarded by villagers, who are very poor with no assistance from government, to be very important. The meat hunting quota is the only sure source of meat protein, as sleeping sickness linked to the tsetse fly vector does not permit livestock of any consequence. The income is

mainly spent on community “common property” activities, schools, dispensaries, clean water, etc. Households do not see this money.

There is also the approximately US\$ 220,000/year from the “Selous 50% retention fund” destined for rural communities (see Section, 9.5.7, Selous Conservation Program (SCP), Tanzania). Like in CAMPFIRE, this income is mostly used for common property development (e.g., schools, clinics, boreholes, roads, etc.) (Hahn & Kaggi, 2001 *In: Baldus, et al., 2001*; Kibonde, *pers. comm.*).

Thus, this money does not go to heads of households.

Likewise, the 25% retention scheme, discussed in Section 9.5.3, Cullman Hurt Community Wildlife Project, Tanzania, ends up in the hands of local government – district councils - and rarely gets to the community, let alone individual heads of households (Hahn & Kaggi, 2001; Siege, 2001b both *In: Baldus, et al., 2001*). Between the 1992/1993 and 1999/2000 hunting seasons, this averaged US\$ 74,000/year (Hahn & Kaggi, 2001 *In: Baldus, et al., 2001*).

Therefore, in theory, this amounts to a total of US\$ 340,001²⁷¹/16,500 households in 2001 or US\$ 20.61/household, though the community only gets its hands directly on US\$ 15.84 - 16.12/household,²⁷² meaning that about 22% of the income from the SGR destined for communities and/or generated outside of the Selous Game Reserve (SGR) in community areas is not directly controlled by the communities. Like most of the CBNRM programs, even the US\$ 15.84-16.12/household money never really reaches the households.

Similarly, if equitably distributed, Igoe & Croucher (2006) estimate as currently managed that 45,000 people in the Burunge WMA of Southern Maasailand would

²⁷¹ US\$ 46,001 + US\$ 220,000 + US\$ 74,000

²⁷² (US\$ 41,327 + US\$ 220,000)/16,500 = 15.84 and (US\$ 46,001 + US\$ 220,000)/16,500 = 16.12

earn US\$ 5.20/person/year, or about US\$ 31/household per year, but in reality most of this income goes to common property benefits and not to households.

Therefore, household livelihoods do not see individual benefits and continue to “poach” natural resources to feed their families and pay school fees, as evidenced by the US\$ 750,000/year spent in anti-poaching out of the US\$ 2 million/year budget of the Selous Game Reserve (SGR) (Kibonde, *pers. comm.*) (see Section, 9.5.7, Selous Conservation Program, Tanzania). In the Selous,

“...as the villages still had not received formal land title, they did not have the authority to harvest the economically valuable resources of wildlife and timber on their lands. These are being used by outsiders – tourist hunters (safari operators) and pit sawyers who are sanctioned by the state. Most villagers depend on subsistence agriculture for their subsistence and cash needs, and in this context the village wildlands can impose negative impacts on the village. The incentives to conserve are not high enough compared with the costs, and there is not a strong motivation for collective action for the sustainable management of wildlife. The impacts on human/wildlife relations have to date been limited. The balance of costs and benefits has yet to tilt in the villagers' favor. Promoting collective action by rural communities can be difficult especially where community cohesion is weak. Socioeconomic status and political influence are two important divisions which can hamper fuller community participation at the level of the village grass-roots” (Gillingham, 1998 *In: Barrow, et al., 2000*).

If the “rules of the conservation game” were correct, little of the antipoaching money would be needed, since the local communities would be the “eyes and ears” of the Selous warden and his staff. In “their WMAs” community members would be policed by “effective community game guards”, respected by the resource users since they would be there not to stop the resource users but to collaborate with them to more effectively manage the resources as a means of improving rural livelihoods (households) and the prospects of their respective

entrepreneurs. A key problem with the 43 hunting and four eco-tourism blocks in the Selous is that for this to work, most of these hunting blocks and the wealth derived from them need to be operated by community-owned hunting/tourism companies in collaboration with SGR management or at least joint ventures with 50/50 net profit sharing.

This is easier said than done, but if ten to 15 years down the line this is not the goal, then the question is will the SGR survive the next 50 years and the projected doubling of human populations in Tanzania from 36.1 million in 2001 to 74 million by 2050 (PRB, 2004)? The SGR makes up 5% of Tanzania's territory, while 327,000 km² making up 30% of the territory is in some form of protected areas (national parks, game reserves, Ngorongoro Conservation Area (NCA), forest reserves, game controlled areas and not counting Open Areas with wildlife) (Maliti, 2003) or 374,494 km² (39.85% of territory) as defined by the IUCN (see Chapter 11, Section 11.10.6.3, Few success stories with the 10% factor). For these conservation areas to survive, the majority of benefits coming from these areas will need to go to peripheral communities and they must have a major role in the management and extraction of resources so that benefits significantly reach household levels. Otherwise, Tanzanians, who by 2005 have been compressed into 60-70% of the country causing major resource environmental degradation, have only one way to go – into the parks and reserves of Tanzania. Repression through anti-poaching is like the little Dutch boy with his thumb in the dike, a short-term stopgap that is not sustainable. Only it is not water but poverty and a mass of humanity which will inundate Tanzania's and Sub-Saharan Africa's parks and protected areas unless communities take pride and ownership over these areas as they do over their gardens, fruit trees and livestock, and then, as we will see, this is only part of the solution, as there are just too many people given the resource base, which is the fundamental problem (see Chapter 11, Section 11.10.6, Eco-

Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers)!

The meager amounts shared with local communities in the Selous program are not unique. It is estimated that in communities living around protected areas such as around the Ikorongo/Grumeti Game Reserves and Inkomo Open Area of the Serengeti in western Tanzania

“individual benefit sharing from the government generates an indirect US\$ 2.50/household/year, while wildlife related direct costs (e.g., wildlife crop losses – up to 33% of households lose 25% of annual harvest valued at US\$ 0.5 million) are US\$ 155/household/ year for communities living on the boundaries of the restricted areas” (Roe & Jack, 2001) or a net loss of US\$ 152.5/household/year from wildlife.

9.7.6.5 Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders

Speaking of the virtual destruction of one of the most vibrant wildlife ranching systems in the world since 2000, a U.S. National Park employee and former advisor to the Botswanan government had the following to say:

“for years we bragged that the wildlife institutions in Zimbabwe were biologically and economically sound. The problem is that they were not politically or socially (racially) sound. The institutions failed because they did not have sufficient involvement and sharing of wealth with black Africans. It will not end with Zimbabwe. The president of Namibia has praised the land redistribution that has occurred in Zimbabwe, and he has hosted teams of Zimbabweans who briefed him on the procedures that were used in Zimbabwe. The horrendous rate of murders in South Africa suggests that the situation there is not sustainable” (Cacek, 2004).

The inequality that exists between Sub-Saharan Africa's safari industry, mostly run by expatriates and/or whites, can be summed up by a comparison given by Baldus and Cauldwell (2004) for areas around the Selous Game Reserve (SGR), Tanzania. The average person works for TZ\$ 600/day, the equivalent of US\$ 0.50-0.60/day. The average daily rate for overseas hunters is US\$ 1,500/day or the equivalent of about six years of local labor working seven days/week (Baldus & Cauldwell, 2004). Watkin (2003) warns of jealousy from uneven benefit sharing between partners as a threat to sustainability in the development of East African community ecotourism. Such inequalities make it difficult for local people to buy into conservation and can only be overcome with a combination of appropriate policies linked to land and resource tenure giving communities ownership over their resources, along with local people knowing the value of resources so that they can negotiate a rightful share of value from harvested resources. Though controversial, one has to ask if analysts such as Patel (1998 *In:* Hasler, 1999) are not too far off in concluding that many of the CBNRM and hunting programs keep rural communities marginalized while maintaining the old colonial ties between the safari operators and governments. As late as August 2005 in the new South Africa, rural black communities in a presentation to the Ministry of Environment and Tourism had the following to say concerning the safari industry,

“this industry is an ‘old boys club’ of white men who keep the clients and their networks to themselves for financial gain. The standards and requirements set for one to become a professional hunter, which you need before being registered as an outfitter, or before you can become the director of a hunting academy, are stacked against black individuals” (RSA Community Organizations, 2005).

One of the most difficult problems in CBNRM is obtaining accurate figures from any private sector operator on the cost of doing business, net profits and distribution of these profits. During the period the principal author worked for the

sport hunting organization Safari Club International, from 1995-2001, technical staff failed at getting safari operators to share details on cash flow in the safari industry. The following is gleaned from a proposal put together by the principal author in collaboration with Franz Wengert in a business plan to the Uganda Wildlife Authority (UWA) in early 2002. This was undertaken under the name of Uganda Windrose Safaris (UWS), a registered company for which the principal author is a shareholder, but which has never operated in Uganda, as the proposal was rejected. The major reasons for this rejection are highlighted in Chapter 11, Section 11.7.3.2, Eco-welfare Uganda, 2002. The proposal called for taking over the management of the Semliki, Bugungu, Karuma and Pian-Upe Game Reserves. The other key investor, Franz Wengert, is a retired millionaire of Wengert Windrose Safaris, Tanzania. These figures are extremely accurate as they are the hidden figures calculated by the principal author in collaboration with Franz Wengert as a means of developing a company. They are believed to be reflective of a typical safari operation over much of Sub-Saharan Africa and lay bare the realities of this very secretive industry. The start-up costs were estimated at:

<u>Item</u>	<u>Start-Up Costs (US\$)</u>
House/Compound	100,000
Equipment For Compound	10,000
Boat and Engine	15,000
Four Equipped Camps	60,000
Unimog Truck	25,000
Tractor	25,000
Vehicles	100,000
Office Equipment	10,000
Register Company	2,000
Consulting Fees	4,500
Other Start-Up Costs	5,000
Marketing	20,000
Subtotal	376,500

An additional **US\$ 50,000** would be reinvested each year thereafter. This is similar to the start-up costs of US\$ 322,000 given by Mayaka (2002) for hunting in Northern Cameroon and US\$ 350,000 in Tanzania (Hurt & Ravn, 2000 *In:*

Mayaka, 2002). One could of course start smaller and build up slowly. Because Wengert had an excellent client base, the idea was to initially use clients' money the first year or two to cover the start-up costs.

Most of the fees below were those used in Tanzania (prior to the new fee structure of 2007, where more income will go to government, see Section 9.6.3.6, SCP, Tanzania) and recommended for adoption to the UWA. This is based on a recommended quota among 34 species, the key 21 key species being:

Recommended Hunting Quota Number	Trophy Fees (Official/Company US\$)	Total Value + 20% Community Surcharge on Trophy Fee (US\$)
35 Buffalo	500/750	31,500
6 Lion	1,000/2,000	14,400
6 Leopard	1,000/2,000	14,400
15 Hippo	500/800	14,400
4 Greater Kudu	600/1,200	5,760
6 Lesser Kudu	750/1,400	10,080
12 Sitatunga	1,000/1,500	21,600
70 Uganda Kob	300/470	39,480
18 Bushbuck	200/400	8,640
14 Jackson Hartebeest	300/480	8,064
8 Zebra	250/450	4,320
24 Defassa Waterbuck	300/480	13,824
12 Bohor Reedbuck	150/300	4,320
9 Giant Forest Hog	750/1200	12,960
18 Bushpig	100/300	6,480
4 Oryx	600/1,000	4,800
12 Oribi	100/240	3,456
2 Roan	600/1,200	2,880
10 Topi	250/250	5,400
10 Crocodile	450/700	8,400
2 Giraffe	750/1,500	3,600
Subtotal	-	238,764
Other Species	-	48,888
Grand Total Trophy Fee Value	-	287,652
Source: Principal Author		

The two trophy fees are 1) what was recommended to government and then 2) what the client would be charged, the difference going as part of the gross profits to the company. Additionally, a 20% surcharge to the client on all trophy fees was proposed to be used for community development. These and the other minor species would be used to conduct:

CATEGORY OF HUNT	TOTAL VALUE, DAILY RATE (US\$)
20 Buffalo 7-day hunts @ US\$ 1,100/day	154,000
Five 21-Day Hunts @ US\$ 1,200/day	126,000
Ten 12-Day Mixed Bag Hunts, @ US\$ 1,200/day	144,000
200 Days non-Hunters @ US\$ 200/day	40,000
Total Daily Rate Value	464,000
Grand Total, Trophy Fees + Daily Rate	751,652
Other Charges To Client (Gun Licenses Dipping/Packing, Transport)	66,750
GRAND GRAND TOTAL FROM HUNTING CLIENTS (Trophy Fees + Daily Rates + Other Charges)	818,402
Source: Principal Author	

It should be noted that it is likely that not all of the annual trophy quota would be used, but this would affect government more than the safari company as it would make the majority of its income from the daily rate. The distribution of income is indicated in Table 9.12.

This is believed to be about as realistic as one can hope on how income is distributed. The percentage of net profits after recurring costs to the company are factored out is:

- 47% for the company
- 39% for the government, and
- 14 % for the communities

Table 9.12: Distribution of income from safari hunting with outside safari company managing hunting block

COSTS AND BENEFITS	US\$	% OF NET PROFITS
GROSS	818,402	
Government Portion of Trophy Fee	138,000	
Gun Licenses	6,000	
Dipping Packing and Export Fees	8,500	
Hunting Licenses	22,750	
Block Fees (4 Blocks)	20,000	
Professional Hunters Licenses (5)	10,000	
Work Permits (5)	2,500	
Company License	2,000	
NET INCOME TO GOVERNMENT (UWA)	209,750	39 (25.6% of Gross Turnover)
Remaining to Company	608,652	
RECURRING COSTS		
PH DAILY RATE US\$ 150/HUNTING DAY, 360 DAYS	54,000	
CAR RATE TO PH US\$ 70/HUNTING DAY, 300 DAYS	21,000	
PH TRAVEL DAY US\$ 40/TRAVEL DAY	2,800	
SALARY 2 NON HUNT PROF, US\$ 100/DAY	40,824	
Salary CEO	20,000	
COMPANY RUNNING COSTS (Elec., FUEL)	100,000	
MARKETING	20,000	
Dipping Packing Fees	14,500	
Subtotal	273,124	
Net To Company	335,528	
COMMUNITY BENEFITS		
GENERAL STAFF	15,000	
OFF SEASON ANTI-POACHING (4 Months)	15,000	
20% Of Total Trophy Fee (Govt. + Company)	47,942	
NET INCOME TO COMMUNITY	77,942	14 (9.5% of Gross Turnover, 5.9% if salaries discounted)
NET PROFIT TO COMPANY	257,586	47 (Gross Profit Margin 32%)
TOTAL NET PROFIT	545,278	

Source: Principal Author

The company's profit is after paying the owners their salaries and covering operational costs so in essence, this is "money in the bank" for the company's owners.

It was recommended that 25% of the government benefits be given to the rural communities, which would have resulted in company benefits remaining the same while net profits to other stakeholders would be:

- 29% for government; and
- 24% for the communities

The actual proposal showed only US\$ 27,000 going to the community from the 20% community surcharge on the trophy fee, so that only about 10% of the net profits would accrue to the rural communities, while the company's percentage would jump to about 50% of the net profits and the government's would remain at 40%. These are the kinds of games played by the private sector to maximize their profits. If the stakeholders are not clearly aware of the costs and the benefits and capable of negotiating an equitable share of the profits, a good capitalist will take advantage of them. Basically, most of the information provided in this section is a "black box" to everyone but the safari operator, giving him/her the comparative/competitive advantage in assuring that he/she obtains significant benefits from this venture.

The gross profit margin²⁷³ to the hypothetical company in Table 5.11 is estimated at 32%. Using data from Lamprey, Buhanga and Omoding (2003), the percentage of profit to a safari company after payment of government fees in the Ugalla East hunting block of western Tanzania in 1992 was 56%. This does not account for

²⁷³ (Net Profit To Company/Gross Profit) x 100 = 257,586/818,402 = 32%

company operational costs, marketing, paying PHs, etc. If the hypothetical company operational and marketing costs are added to the net profit shown in Table 9.12, a similar figure of 65% of the gross turnover is derived, indicating that the gross profit margin should be in the same ball park for the Ugalla block if operational costs are considered. With the data given by Lamprey, *et al.* (2003), running costs are not provided; therefore the gross profit margin cannot be determined.

Communities receive much less than the 25% net profits compared to the other two stakeholders as calculated by Mayaka (2002) for Cameroon, while the gross profit margin to the safari company is higher than the 20-25% gross profit margin suggested by Hurt and Ravn (2000 *In:* Mayaka, 2002), but not too different. De la Harpe, *et al.* (2004 *In:* Child, B., 2004a) give a rule of thumb recommendation for communities/landholders to negotiate 33% of the turnover (gross) from hunting and 10% of the turnover from tourism. In the case above, the community is receiving only 9.5% of the turnover and only 5.9% for community development if salaries are excluded (Table 9.11).²⁷⁴ Child, Castley *et al.* (2004 *In:* Child, B., 2004a) recommend that the producer community captures 33-40% of the outfitters turnover from safari hunting. However, Khumalo (2005) estimates that CAMPFIRE communities capture only 10% of the gross turnover from safari hunting, similar to that in Table 9.12, but does not separate out income from hunting on private and state lands versus CAMPFIRE areas that could significantly increase the actual gross profit margin to the community. In 2001, 9% of the turnover to the community could be calculated from both consumptive and non-consumptive tourism in the Kunene, Erongo and Caprivi regions (Long, 2004).²⁷⁵ Based on analysis of ADMADE data from 1992 (DeGeorges, 1992a), a gross profit margin to the safari operator is obtained of from 14-19% respectively

²⁷⁴ (US\$ 77,942/US\$ 818,402) x 100 = 9.5% of gross turnover to community

²⁷⁵ (US\$ 833,333 to communities/US\$ 9,416,666) x 100 = 9%

for Grade B²⁷⁶ and Grade A²⁷⁷ hunting blocks, while the community received on average 3.7-4.4% of the gross turnover of which 1.7-2.0% of this went directly for community development (see Section 9.5.2, ADMADE, Zambia and associated footnotes).

The above figures may vary as to the exact trophy fee. Some safari companies retain the government trophy fee in their advertisements while upping the daily rate to make their profit. It is a matter of marketing strategy (e.g., drawing people in with a relatively low daily rate and catching them on the trophy fee). The safari industry is very competitive and within a limited range, there is room for manipulating the price structure. Certainly, the price charged to the hunting client is not purely about trophy quality, which can be excellent on fenced game ranches. The top daily rates in Africa come from those countries in Africa (e.g., Tanzania, Botswana, Zambia, Cameroon, RCA) that can still provide the experience of “Wild Africa” to their clients: large free ranging areas, where one can as easily bump into a lion and elephant as a kudu and at night can listen to the lions roaring and the hyenas cackling.

It is believed that benefit distribution to stakeholders from tourism is similar. In the case of Maasai Mara, Kenya, what appears to be gross turnover to the surrounding communities from eco-tourism in 1988 amounts to only 1% to the Maasai and 10% to local government (Narok Council). Likewise, only 1% of gross turnover from the Amboseli National Park in 1990 went to the peripheral Maasai communities, amounting to US\$ 150,000 out of US\$ 15 million of wildlife revenues (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure

²⁷⁶ Gross profit margin from Grade B hunting block to safari operator = [(US\$ 145/day to safari operator after expenses x 168 days = 24,360)/US\$ 177,600 Gross Profits) x 100] = 14% gross profit margin to safari operator in ADMADE, Zambia.

²⁷⁷ Gross profit margin from Grade A hunting block to safari operator = [(US\$ 230/day to safari operator after expenses x 252 Days) = US\$ 57,960/US\$ 309,600 Gross Profit] x 100 = 19% gross profit margin to safari operator in ADMADE, Zambia.

and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya).

Anyway, it looks as if today, in 2007, the income from hunting and tourism to communities is skewed and, as shown, is insignificant. This becomes most evident at the household level.

Unfortunately, even where countries are Africanizing the safari industries, as discussed, most African safari operators do not come from or represent the communities, but come out of the already politically connected private sector or bureaucratic elite patronage system. Both use their connections to obtain safari concessions and exhibit a behavior no different from the expatriate safari operators in their relationship with rural communities and the sharing of wealth from their resources. In other words, to local communities they are as much foreign interlopers as a Frenchman or German safari operator exploiting the communities' resources; "white black men".

Magome and Fabricius (2004 *In: Fabricius, et al., 2004*) state that "if the bulk of benefits from biodiversity conservation accrue to outsiders (that is, someone else benefits from the efforts of local people), then other strategies need to be adopted to conserve the resource in question". As noted in Table 9.12, most of the jobs for Africans in the safari industry are low paying (skimmers, trackers, tent boys, cooks, etc.), amounting to US\$ 15,000/year distributed between 50 full and 50 part time employees, while five expatriate staff would split US\$ 135,824 plus profits. The disparity is evident.

A major problem with most CBNRM programs is that management contracts with communities have had little to do with management, wildlife monitoring or running the business. They are "laborers and landlords", which results in passive

participation and strong disincentives to work (Boggs, 2004 *In: Fabricius, et al.*, 2004), since community benefits are given for being “observers on the sidelines” rather than players on the field; a form of welfare where you are given money for waking up in the morning. Jones and Murphree (2004 *In: Child, B.*, 2004a) conclude that in most CBNRM areas of Botswana and Zambia, communities tend to be passive recipients of benefits from wildlife without engaging in active management.

The authors believe that this is an endemic problem across CBNRM in Sub-Saharan Africa and has much to do with the government’s unwillingness to give up control over power and potential wealth to communities from full land and resource devolution. In other words, there is little or no motivation by rural communities/resource users to accept or buy into Western ideas of conservation if both the economic (e.g., low benefits/household and/or little or no distribution to households, plus only menial labor jobs) and cultural benefits are negligible and they feel little or no ownership over the business or the resources that consequently become insignificant in their daily lives. Common property theory argues that rural communities and resource users must be empowered to make decisions, enforce rules and actively own resource-related businesses (Ostrom, 1990 *In: Boggs, 2004 In: Fabricius, et al.*, 2004). This is rarely the case to date.

Capitalism will not hand the communities their supper. In order for change to take place and for communities to take control, they must understand the costs and benefits to the industries operating on their lands, be they safari hunting, photo safaris, mining or logging companies.

Unfortunately, governments and the private sector are taking the “lion’s share” of the profits that should accrue to the rural communities. This is happening because of antiquated laws over land and resource tenure and ignorance on behalf of the

communities. As is discussed under the Dozo case study in Burkina Faso (Section 9.8.9.1, Management of the Comé-Leraba Game Reserve, southern Burkina Faso) and the White Mountain Apache case study (Section 9.9, WHITE MOUNTAIN APACHES, LESSONS TO BE LEARNED FROM AMERICA FOR AFRICAN CBNRM), at a minimum, the trophy fees should go to the community. The government's taking of the trophy fee is like taking the value of each cow on a man's land; why would he want to keep cows or, in this case, wildlife (see Section, 9.7.6.2, Stop taxing the full value of the community's wildlife)? The government should be happy with the hunting license, gun license and dipping/packing and company license fees, work permits, as well as annual company and personnel taxes. Block fees should go to the community to cover the costs of managing the area.

As community members become better trained, ideally, they should form a not-for-profit safari company and then the lion's share of the profit, including the daily rate and trophy fee, should go to the community or community shareholders (Table 9.13).

Bond, *et al.* (2004 *In: Child, B.* 2004a) call it a “village company”. They go on to explain that both trophy hunting and photographic tourism are luxury products with a high-income elasticity, meaning that they are sensitive to global economies and incomes and national/regional/global political instability. This implies that some diversity (e.g., catering for both overseas and local tourists and hunters, diversifying into adventure tourism, sport fishing and cultural tourism) can help a company weather hard times such as a global economic downturn, a locally strong currency as South Africa was experiencing in 2004/5 or threats from terrorism that discourage international travel. De la Harpe, *et al.* (2004 *In: Child, B.,* 2004a) argue that the commercialization of resources in protected areas, be it tourism or hunting, have minimal risks and tend to be self-controlling if “high-value goods” such as trophy hunting and luxury up-market tourism are the driving

economic engines, compared to high risk “low-value bulk commodities” such as mass tourism and game meat production.

Table 9.13: Distribution of income from safari hunting with community-owned safari company and trophy fees going to land owners

COSTS AND BENEFITS	US\$	% OF NET PROFITS
GROSS	818,402	
Gun Licenses	6,000	
Hunting Licenses	22,750	
Dipping Packing and Export Fees	8,500	
Block Fees (4 Blocks)	20,000	
Professional Hunters Licenses (5)	10,000	
Work Permits (5)	2,500	
Company License	2,000	
NET INCOME TO GOVERNMENT (UWA)	71,750	14
Remaining to Community Safari Company	746,652	
RECURRING COSTS		
PH DAILY RATE US\$ 150/HUNTING DAY, 360 DAYS	54,000	
CAR RATE TO PH US\$ 70/HUNTING DAY, 300 DAYS	21,000	
PH TRAVEL DAY US\$ 40/TRAVEL DAY	2,800	
SALARY 2 NON HUNT PROF, US\$ 100/DAY	40,824	
Salary CEO	20,000	
COMPANY RUNNING COSTS (Elec., Fuel)	100,000	
MARKETING	20,000	
GENERAL STAFF	15,000	
OFF SEASON ANTI-POACHING (4 Months)	15,000	
Dipping Packing Fees	14,500	
Subtotal	303,124	
Net to Company	443,528	
NET PROFIT TO COMMUNITY AFTER EXPENSES		
[Gross-(Government Fees + Recurring Costs)]	443,528	86
TOTAL NET PROFITS (UWA + COMMUNITY + SAFARI COMPANY)	515,278	100

Source: Principal Author

With a community-owned company plus keeping trophy fees, net profit distribution is radically changed:

- 14% of the profits after operational expenses go to government
- 86% goes to the community

The amount of US\$ 443,528 versus US\$ 77,942 is a 5.7-fold increase in income to the community.

If necessary, they can hire professional hunters until they get people from the community trained up. Unfortunately, unless human populations are low relative to the resource base, this still may not make a significant economic dent at the level of the household and still argues for allowing the community a diverse use of the resources from the hunting block as long as the off-take is controlled and sustainable based on land use planning (see Section 9.10, WHITE MOUNTAIN APACHES, LESSONS TO BE LEARNED FROM AMERICA FOR AFRICAN CBNRM). To be successful, this will also require conservation to fit into a larger plan to urbanize and industrialize the continent, taking pressure off the resource base, as discussed in a number of places throughout this book. This could be in addition to allowing controlled meat hunting, charcoal making, logging, fishing, honey/wild food, wild medicine, maybe some grazing of livestock, etc. to maximize household income.

To derive the above revenues means that well-trained people in marketing, safari operations and professional hunting from the communities will be required. Ideally, some community members will be trained at the tertiary (university) level in wildlife/habitat management as discussed in Section 9.7.5, Lack of Technical and Management Skills. To charge these prices, they must be able to meet certain standards of accommodation, transport, cuisine and overall experience. It will not

be easy, but Cacek (2004) gives ample examples of successful African safari operators to indicate that this change can and must happen if wildlife and safari hunting are to survive the 21st century intact. At a recent meeting between the principal author, John Jackson of Conservation Force and George Pangeti, current deputy director of the Zimbabwe Parks Board and former deputy director of Wildlife, who also serves as a technical consultant to Safari Club International, Pangeti (*pers. comm.*) stated that the overseas sport hunters had better get used to hunting with black professional hunters and safari operators – that is the wave of the future.

Later in this chapter, community run *chasse libre*/self-guided hunts in Burkina Faso are discussed as possible models (see Section, 9.8.9, *Gestion des Terroirs*, West Africa) (Figure 9.2). The sport hunter is guided by a traditional hunter. The income in *chasse libre* is much lower due to reduced daily rates and salaries since the communities are currently unsophisticated and are unable to provide the services of luxury safaris usually provided by expatriate white operators (Tables 9.14 and 9.15). If they undertook a joint venture with a “great white hunter”, he would keep the daily rate and thus their earnings would not be much different, possibly even less. On the other hand, in a *chasse libre* program, the community has little or no overhead, since the client furnishes/rents all materials from vehicle to camping gear to food, even salt – the lower daily rate is money in the bank for the community. This is a market niche with much potential, allowing communities to enter into a safari operation with minimal capital. In Burkina Faso, the communities make most of their money on the trophy fees. Thus, this mandates trophy fees going to communities, as a minimum, if *chasse libre* programs are to be economically viable.

Table 9.14: *Chasse libre* costs Burkina Faso, direct costs going to community and government

COST	CFA	US\$ or EURO	Jobs	CFA 14 DAY	US\$ 14 DAY	CFA 9 PLAINS	US\$ 9 PLAINS
				BUFFALO HUNT	BUFFALO HUNT	GAME HUNT	GAME HUNT
HUNTING LICENSE	120,000	185		120,000	185	120,000	185
TEMPORARY IMPORT PERMIT RIFLE AT EMBASSY IN WASH DC	120,000	185		120,000	185	120,000	185
CERTIFICATE D'ORIGINE	4,000	6		4,000	6	4,000	6
DAILY RATE BUFFALO, 40,000							
CFA/DAY/PERSON MINIMUM 14 DAYS	40,000	62		560,000	862		0
DAILY RATE PLAINS GAME, 40,000							
CFA/DAY/PERSON MINIMUM 10 DAYS	40,000	62			0	400,000	615
TROPHY FEE BUFFALO - ASSUME 1							
BUF/PERSON/HUNT	450,000	692		450,000	692		0
TROPHY FEE ROAN	300,000	462		300,000	462	300,000	462
TROPHY FEE HARTEBEEST	150,000	231			0		0
TROPHY FEE COB DU BUFFON	250,000	385			0		0
TROPHY FEE SING- SING WATERBUCK	240,000	369			0	240,000	369
TROPHY FEE WARTHOG	80,000	123			0		0
TROPHY FEE BUSHBUCK	250,000	385			0		0
COMMON PROPERTY BENEFIT FOR COMMUNITY ASSUME 2 TROPHIES PER HUNT				1,310,000	2,015	940,000	1,446
SUBTOTAL				1,554,000	2,391	1,184,000	1,822
PERCENTAGE OF ALL FEES TO COMMUNITY				84%	84%	79%	79%

Table 9.14 (Cont.): *Chasse libre* costs Burkina Faso, direct costs going to community and government

Table 9.15: Burkina Faso *chasse libre* costs to hunter other than direct safari costs

OTHER COSTS	CFA	US\$/EURO	14 Day Buffalo Hunt CFA	14 Day Buffalo Hunt CFA	10 Day Plains Game CFA	10 Day Plains Game US\$/EURO
COST OF 1-2 NIGHTS IN VILLAGE BEGINNING AND END OF HUNT			INCLUDED IN DAILY RATE FEE EXCEPT FOOD		0	0
TRANSLATOR 30000CFA/DAY ASSUME 2 DAYS BEGINNING AND END OF HUNT	30,000	46	120,000	185	120,000	185
VECHILE FUEL - ASSUME US\$ 250	162,500	250	162,500	250	162,500	250
HOTEL YIBI OUAGADOUGOU 30000 CFA/NIGHT ASSUME 2 NIGHTS COMING AND 2 NIGHTS GOING	30,000	46	120,000	185	120,000	185
FOOD 20000CFA/DAY MAX	20,000	31	280,000	431	180,000	277
SHIPMENT OF TROPHY ASSUME US\$ 500	325,000	500	325,000	500	325,000	500
PLANE TICKET ASSUME US\$ 1500	975,000	1,500	975,000	1,500	975,000	1,500
OTHER, SALT, BONUSES, ETC.	195,000	300	195,000	300	195,000	300
SUBTOTAL OTHER COSTS			2,947,500	4,535	2,572,500	3,958
GRAND TOTAL COST TO SPORT HUNTER			4,858,480	7,475	3,993,130	6,143
NOTE: Cost To Hunter Greatly Reduced If 2 People Hunt Together, Cut Out Translator, Vehicle Only Picks You Up And Drops You Off, Etc - These Are Maximum Costs. At time of this analysis, US\$ and Euro at the same exchange rate 650 CFA, in late 2005 exchange is Euro 650/CFA and about US\$ 550/CFA. Apples to Tables 9.14 and 9.15						
Source: Raw Data Provided By Jean Michel Pavé, World Bank, Abidjan, Cote d'Ivoire and Morgane Echappé in Burkina. Table constructed by principal author						

Thus a *chasse libre* hunter in 2005 paid US\$ 7,475 all inclusive, including plane ticket, vehicle rental, food, daily rates and trophy fees for a buffalo and a roan antelope on a 14-day buffalo hunt. The community earned US\$ 2,565 (34%) of the gross, including employment (more if the plane ticket is not counted) from this total in daily rates and employment, while the government earned US\$ 376 in various fees. An all-inclusive ten-day antelope hunt cost the hunter US\$ 6,143, assuming two trophies, a roan and sing-sing waterbuck. The community earned

US\$ 1,810 (33%) of the gross, including employment (more if the plane ticket is not counted), while US\$ 376 goes to the government.²⁷⁸

In addition, what a community gains from the *chasse libre* program, which does not happen under a joint venture with an outside safari operator, is the pride and dignity of running their own operation, which is not dissimilar to the White Mountain Apache hunting scheme.

As these communities become more sophisticated and offer more services (e.g., provide their own vehicle, food and camping gear), they can up their daily rates and salaries and start marketing to a higher paying clientele. For instance, the White Mountain Apaches offer their clients luxury lodges, food and ground transport, as well as the top elk trophies in North America and can thus afford to charge US\$ 15,000 dollars for about a five-day hunt. In addition, there is a three-year waiting period. Thus, quality of services and uniqueness of trophy/experience in a market-economy dictates how much one can charge (see Section 9.9, WHITE MOUNTAIN APACHES, LESSONS TO BE LEARNED FROM AMERICA FOR AFRICAN CBNRM). A major constraint will be overcoming the myth of the “great white hunter” that to this day is romanticized in hunting books in favor of the “great black hunter”. This attitudinal change will take time, but quality trophies and good experiences will change attitudes.

Chasse libre prices are indicative of just how far many African rural communities have to go to be able to maximize profits from wildlife based on improved marketing and services. However, uniqueness such as a bow hunter hunting with Bushmen or being guided by traditional Dozo hunters and 14 day classical foot

²⁷⁸ Note: This is based upon 2003 data. In 2007, a 14 day buffalo hunt will cost Euro 4,500 + 890 Euro in trophy fees if a buffalo and roan antelope are taken; Euro 5,390 in total (US\$ 7,258). A 10 day antelope hunt will cost Euro 3,500 + 830 Euro in trophy fees for a roan and waterbuck; Euro 4,330 in total (US\$ 5831). This does not include costs of airline, hotel before and after, tips, alcohol or trophy shipment (DeGeorges, 2007).

safaris with Pygmy hunters have the potential to be marketed as both a hunting and cultural experience for which the hunter should be willing to pay dearly. Currently, this is not the case.

Communities wishing to start their own business can cut down significantly on the start-up costs. Camps can be made inexpensively out of local materials with local labor. One of the nicest camps the principal author has seen was a camp that was virtually an “African village” belonging to the famous but late French safari operator, Jacques Guinn. There were no generators, only paraffin lamps and refrigerators. The woven mat compounds in Zambia and Burkina Faso’s Comé-Leraba Reserve hunting camps are other examples, though they must be rebuilt yearly. Another way of decreasing start-up expenses is by hiring professional hunters who come with their own vehicles, the reason for car rates in Tables 9.12 and 9.13 is to reimburse the professional hunter for wear and tear on his vehicle. Thus, the community safari company should be able to initially get by on one vehicle and slowly build up as net profits are reinvested into the safari operation. Finally, a compound need not cost US\$ 100,000 (cost estimated for a compound in Entebbe, which would have served as an office, living quarters, supply storage and garage), especially if built locally by the community. However, someone in an urban center will need access to the Internet to communicate with clients, handle inquiries on a daily basis and be available to help clients through customs.

Another option to avoid the reduced income from *chasse libre* is for a community to negotiate with a safari operator/mentor to joint venture with a built-in requirement for on-the-job training so that after ten to 15 years, the community can be running most of the operations themselves, gaining the benefit of an increased daily rate. In addition, to sending off selected community members for tertiary training in nature conservation, hotel management, catering, marketing, business, accounting, etc., be it in safari hunting and/or tourism, any joint venture

initiative that will surely be with an “outside of the community area” private sector partner, should consider the following within the contract:

- The majority of the employment goes to the community.
- Purchasing as much locally produced materials (e.g., vegetables) as possible.
- Community members will be trained in skill positions initially filled by outsiders through on-the-job training (professional hunters and guides, camp managers, cooks, drivers, etc.).
- Tertiary training scholarships will be provided for certain skill positions as noted, with general scholarships provided so that youth can fit into a global society, most likely in urban centers.
- A 15-20 year horizon should be provided for, in which the lodge or safari operation becomes community-owned.
- Some youth on returning from their studies and/or traditional hunters from the community will be apprenticed as professional hunters.
- Key people from the community will be trained in company management and exposed to the overseas market such as the SCI and Dallas Safari Club conventions. Developing links to the market place and overcoming dependency on a middleman may be the most important aspect of this learning experience. Without it, be it in wildlife, general tourism, timber, minerals, agricultural produce, etc. Sub-Saharan Africa will always be dependent upon the middleman who will take the majority of the profits.
- This also holds for adopting technologies of transformation, such as taxidermy, as a means of beneficiation (added value) from the resources. For instance in South Africa the added value of taxidermy is between US\$ 10-28 million/year (See Chapter 5, Section 5.12.7, Attaining Food Security through More Appropriate Land Use Options, Wildlife as a Land Use Option on Marginal Lands).
- Client lists will be gradually transferred over to the eventual community-owned company.

One problem with this, as summed up by Emerton and Mfunda (1999 *In: Roe & Jack, 2001*), is that

“private sector initiatives such as direct payment of fees for land use, the promotion of wildlife related markets, and the development of joint management projects do have the potential for increasing the local value of wildlife, although they do not compensate for opportunity costs. However, these initiatives may simply be replacing the existing top-down governmental model of

conservation, and unless they directly increase landowners' control over the management of their own resources, local communities will remain dependent on these external agencies”.

This comes back to the best option of communities starting their own companies. The “community-owned company” would hire white professional hunters to hunt and market, and to apprentice local community members in professional hunting, while taking them marketing in America and Europe. The community in the meantime would still retain ownership of the company and thus the majority of net profits as reflected in Table 9.13. In such cases, involving an older semi-retired safari operator/professional hunter as a “mentor” might be the way to go. This latter option permits the community to retain the lucrative daily rate! They could also use a booking agent, who will take about 15% of their daily rate, to find clients, but then must have the other skills and sophistications, many of which are lacking today, but which can be acquired through experience and on-the-job-training with a mentor. This same concept is being used to get subsistence farmers into commercial farming in South Africa (see Chapter 5, Section 5.12.6.1, South Africa, an emerging model in public private partnerships).

Once again, the community must clearly understand the costs and benefits and assure itself an equitable share of the net profits. Right now, this is not the case. Jones and Murphree (2004 *In: Child, B., 2004a*) describe this as an imbalance of power in negotiations between communities and the private sector, which has capital, knowledge of the industry and implementation expertise such as marketing, client rapport, camp development, etc. Unless the community is wide awake, the risk is that they will be taken advantage of by the private sector with regards to equity in revenue sharing or even in over-harvesting wildlife resources for short-term gain.

In certain cases, the use of tendering/auctioning has been tried to “force” the private sector to maximize its share of the profits (e.g., CAMPFIRE in Zimbabwe, Botswana Community Trust Program and ADMADE in Zambia). Better, however, is to clearly understand the bottom line net profits and to be prepared to sit down at the negotiating table with the safari operator of choice, someone a community feels comfortable with, in order to “cut a deal”. There are a number of instances where unscrupulous operators have overbid, giving a larger share of the profit to the other stakeholders than makes economic sense, in order to obtain a hunting area and then over-shoot the blocks to get their profit out. Regardless, the community will have to be trained in monitoring the wildlife and habitat in its hunting block, while monitoring the off-take to assure that its resources are not being abused and that wildlife utilization is sustainable both economically and ecologically. Once again, this spells out the crying need for tertiary education for selected members from the community to return and manage these businesses. There is also a need for a mentoring program.

All of this takes time and time is running out for Sub-Saharan Africa, its people and their wildlife.

9.7.7 Inappropriate or no Wildlife Monitoring to Assure Sustainability

“In the absence of reliable ecological data, cumulative experience of setting quotas over many years relying on a number of indicators (e.g., trophy quality) provide the basis for an adaptive management approach” (World Bank, 2005).

While “adaptive management” is believed to be the only hope for the long-term conservation of wildlife by getting added value for wildlife from international tourists and hunters, one of the shortcomings is the perceived failure of governments to maintain or establish long-term cost effective wildlife monitoring

programs to assure that the off-take is economically and ecologically sustainable, both in and out of CBNRM areas.

Most wildlife monitoring programs in Africa have been dominated by Western researchers and scientists without concern for cost, being propped up by donors, and with little or no understanding for the kind of biological and physical data needed to make decisions about hunting quotas and other interventions. Very often, expensive aerial surveys are employed with high standard errors, making the information useless for making management decisions. Techniques such as aerial “distance sampling” every third year (if money were available, which tends not to be the case unless a donor is funding the effort, and then this is not sustainable since in time the donor will tire and leave), with on-the-ground monitoring by professional hunters, rural communities and wildlife department officials are believed to be more cost effective, while providing useful information to make informed management decisions (DeGeorges & Reilly, 2002). It is highly questionable as to whether total numbers are needed for trophy hunting.

“It is clearly not feasible to accurately estimate populations for all hunting areas. It is doubtful that a truly scientific basis for setting quota will ever be developed in the complex-multi-species ecosystems in Africa. Instead the cumulative experience of setting quotas over many years that relies on several verifiable indicators (population estimates, trophy quality, age, off-take levels, etc.) that can demonstrate little or no significant detrimental impacts on the wildlife populations provides the bench mark that allows for the confidence of setting hunting quota through an adaptive management approach...Maintaining adequate trophy quality from a population over a period of time is sufficient evidence that the population is not being over-hunted” (Baldus & Cauldwell, 2004).

Thus, additional data, if money is available, may improve decision-making, but at a minimum, trophy quality trends over time should be mandatory for any trophy hunting program in Sub-Saharan Africa (von Brandis, 2004).

However, if in the future meat hunting is desired, having some ideas of total numbers for those species to be harvested for meat would be desirable. In addition, periodic population estimates of charismatic species such as lion, leopard and elephant may be needed to fight international political battles or to meet international requirements such as at CITES (see Chapter 10), where the animal rights groups attempt to use misinformation to shut down hunting, believing it to be immoral. Due to their cryptic nature and the cost if not impossibility of obtaining total counts, figures on national and regional lion and leopard populations will always be educated guesses based on best available data and put together by experts, not total counts, as seen in the latest attempt to describe lion populations in Sub-Saharan Africa (Chardonnet, 2002) (see Chapter 10, Section 10.8.2.1, Status of African lion, Vulnerable [VU A2abcd], Except Regional Population of West African). Indices such as nose pigmentation, teeth, facial markings, leg markings, size and mane development at harvest (Whitman, 2002; Whitman & Packer, 2006) as well as skull measurements (DeGeorges & Reilly, 2002), tooth aging (DeGeorges & Reilly, 2002; Cheater, Thesis in preparation) and carcass length and weight after harvest may be used to determine whether the lion is/was of a harvestable age (DeGeorges & Reilly, 2002). Similar indices could be developed and would apply to leopards.

Hulme and Taylor (2000 *In:* Lee & Kirkpatrick, 2000) explain that worldwide, wildlife biologists have yet to achieve the goal of knowing the total population size by species. They explain that aerial surveys, in addition to being expensive, are generally effective for large dark-bodied herbivores such as elephant, buffalo and sable, but inefficient for most smaller-bodied antelope in wooded savannas where sampling and observer biases are particularly problematic. They

recommend adapting wildlife monitoring to local conditions through the collection of indices as opposed to trying for total game counts. They state that 1) rural communities have in depth knowledge about wildlife, 2) census must be a means to an end, the establishment of a sustainable high-quality trophy off-take for the lucrative market, 3) the goal should not be trying to get total numbers but trends/indices (population increasing, stable or decreasing; trophy quality; hunter effort “catch-per-unit of effort” – how many days to harvest each key trophy; hunter success – did hunter succeed or not in getting key trophies; herd structure, size and movements, recruitment, degree and location of encroachment such as poaching, livestock, small farmers, etc.) while keeping a constant error, 4) methods that require highly accurate measurements, sophisticated technology and complicated analyses should be avoided and are likely not sustainable, 5) annual counts, random walks by game guards and fixed transects provide an index of population abundance, where accuracy is less important, but precision with a high level of repeatability with a constant error is critical and 6) observations per time as opposed to distance may be easier to measure unless a vehicle or GPS is employed. They found that when compared, in the same area, random walk sample counts and transect counts showed little or no difference. Further discussion on the issue of total counts is provided in Chapter 10, Section 10.7.2.2, “Enhancement as a requirement. Why it was inappropriate in 1993 and still is so in 2002”. This section deals with the fact that total elephant counts (e.g., population estimates with high standard deviations/errors) were required before allowing hunted trophies into the United States.

Hulme and Taylor (2000 *In:* Lee & Kirkpatrick, 2000) explain that while biologists tend to stratify and systematically count across ecological gradients to count game, local residents go directly to the areas where they know the game occurs. Game guards can be used to collect such information, along with sport and professional hunters. Parker (2004) is a strong proponent of using local knowledge to estimate wildlife status. Speaking of Jonathan Kingdon’s

compilation of data on East African fauna using traditional hunters, among others, Parker (2004) states

“living among the animals, they knew infinitely more about local distributions than did transient white research boffins”,

who would most likely have been expatriates in East Africa as opposed to Southern Africa. The wildlife biologist/anthropologist Marks has been using success rates versus time and distance from village by traditional hunters for years as indices of wildlife abundance in the Munyamadzi Corridor, Luangwa Valley, Zambia (Marks 1994; 1996).

Similarly, an analysis of wildlife monitoring in two hunting blocks, one of which was the Munymadzi Corridor of ADMADE indicates that

“measures of hunting effort, hunting success and trophy size for animals hunted by safari clients are also indicators used for assessing population trends and together with trends reflected from respondent interviews, are useful for helping set hunting quotas. The scientific merit of this approach was tested by comparing population sizes, estimated from an aerial counting survey, with relative population sizes as based on their relative quota sizes set by using these indirect indicators. The results will be presented elsewhere in detail but will show a high correspondence between estimated population size from aerial survey and predicted relative size differences as based on indirect measures...other indicators that ADMADE has identified useful for measuring to cross-compare. These between-year changes in 1) Safari client complaints over land use disturbances, poacher encounter rates taken from patrol data, snare encounter rates, and incidence of animal sightings” (ADMADE Foundation, 1999).

Currently, hunting quotas in most of Africa are guesstimates, “thumb sucks”, based on little or no biological data. Very often, they are based on desired economic outcomes for the year and not on good science or business – that is maintenance of the best trophy quality possible as a means of asking top prices for hunting safaris. In this case, good business requires good science to help maintain

trophy quality. The authors wish to make it clear that trophy hunting on its own will not be detrimental to wildlife, as the off-take tends to be between 2 and 5% of the annual population for a particular species. It can be argued that due to the low off-take from trophy hunting, well before there is any danger to a biological population, trophy quality and hunter success will significantly decrease, while hunting effort will increase and trophy hunters will likely go elsewhere and/or the cost of the hunt will have to be significantly reduced. However, cost-effective appropriate monitoring can help identify adverse impacts on a population prior to a crisis as occurred in 1997 when hunting success collapsed with the bongo in Southeastern Cameroon (see Chapter 11, Section 11.11.7.2, Closure of bongo hunting) or a population collapse occurs from factors such as uncontrolled poaching, predator/prey imbalances, drought, diseases, over-grazing from livestock competing for the same pasture and encroachment by farmers. In 2001, the Tshwane University of Technology (TUT), South Africa, and Safari Club International held a series of workshops across Africa, which dealt with the use of trophy quality monitoring and hunting effort as wildlife management tools. As with many short-courses, it is doubtful that these techniques were institutionalized. Newer collaborative programs between the TUT and Sub-Saharan governments (e.g., Mozambique and Zambia) in which government officials, as part of their masters and doctorates must institutionalize such processes, offer more hope! A masters thesis by von Brandis (2004) demonstrated that trophy quality trends could be monitored at a national level. Ultimately, these same techniques need to be applied at the level of a hunting block or blocks that share populations of wildlife – the level at which management must occur in establishing sustainable hunting quotas.

Fairhead and Leach (2003) see this monitoring as a means by which Western science and research, along with the state and NGOs, attempt to move in and control access to community resources by applying bureaucratic requirements and

hurdles through the application of the “precautionary principle” (see Section 9.2.1, Precautionary Principle; Studying Wildlife to Extinction). To some degree, this may be true, especially if sophisticated total counts are required. However, as the ratio of natural resources to human population decreases, increased pressure on the resource base and the modern desire to valorize resources in economic terms will increasingly require the application of Western intensive management systems. For this reason, it will be necessary to train youth from these rural areas in “appropriate and cost-effective monitoring”, planting them back into their communities as resource managers, as a means of minimizing external intrusion into their lives. For instance, in the case study below from southern Burkina Faso, ideally a number of youth from the rural area need to be chosen by the community and sent for tertiary training (see Section 9.8.9.1, Management of the Comé-Leraba Game Reserve, southern Burkina Faso). Shikar Safari Club has just awarded a scholarship beginning in the 2006 academic year to Yaya Ouattara, a youth from this area, to study for a diploma in nature conservation. (Also, see Section 9.7.5, Lack of Technical and Management Skills). This holds true regardless of the resource, be it wildlife, timber, fish, etc.

9.7.7.1 CAMPFIRE, Zimbabwe

The CAMPFIRE program has attempted to bring stakeholders (e.g., safari operators, rural communities, local government, NGOs) together to share data and through consensus establish annual quotas (WWF, 1997; WWF, 2000a; WWF, 2000b). This has occurred through WWF/Zimbabwe acting as a facilitator. Quotas in CAMPFIRE areas are set through a participatory approach, where key stakeholders (e.g., local community, safari operator, WWF, Department of Wildlife and National Parks) bring the above data trends to the table as a basis for decision-making (Figure 9.3). Careful quota setting has maintained the average elephant tusk quality at 40 pounds (Child, 2005 *In: Lyman & Child, 2005*). In 2001, the principal author held a short course in trophy quality and hunting effort

monitoring for the Zimbabwe's Department of National Parks and Wildlife Management (DNPWM) in collaboration with Norman Rigava, then of WWF/Zimbabwe, who has trained stakeholders in wildlife monitoring and quota setting. It is unclear as to whether any of this was institutionalized to deal with hunted game outside of the CAMPFIRE areas.

Quota Sheet 1996: Omay Communal Lands The proposed 1996 hunting and cropping quota for Omay Communal Land								
SPECIES	1995 Quota	Aerial Survey	Trophy Quality	Safari Operator	Community Poaching Information	1996 Quota	Comment	
Elephant Bulls	20	↑ ↔	↔ ↓	↔	↑	20	8 PAC	
Elephant Cows	6	↑ ↔		↔	↑	10	10 PAC	
Buffalo Bulls	110	↔	↔	↔	↑↑↑	110	10 PAC or cropping	
Buffalo Cows	40	↔		↔	↑↑↑	40		
LION	8			↓	↑	6		
LIONESS	2			↓	↑	2	PAC only	
HYAENA	8			↑		4		
CROCODILE	6		↔	↑	↔	10	Pop. seems to be increasing	
SABLE	8	↔ ?	↔	↔	↔	10		
BUSHBUCK	32	?	↔	↔	↔	32		
WATERBUCK	30			↓	↑	30		
IMPALA MALE	910	↑↑↑	↓	↓↑	↑↑↑	160	Trophy only	
Impala Female	790	↑↑↑			↑↑↑	40	Trophy only	

KEY TO TABLE								
↑ population increasing	↔ population stable	↓ population decreasing	? population changes unknown					

Source: WWF (2000b) with permission, WWF.

Figure 9.3: Example, triangulation of information in adaptively adjusting quotas in CAMPFIRE areas

9.7.7.2 ADMADE, Zambia

While Dale Lewis ran his center at Nyamaluma²⁷⁹, on the southern border of the Luangwa South National Park, he attempted to gather information from safari operators based on forms, which they filled out to capture observational data such as trophy quality and hunter success (NPWS, 1990).²⁸⁰ According to Lyons (2000),

“the safari hunting data forms record includes starting and ending dates of a hunt, license numbers, fees paid, species desired by the client before the hunt (used to determine hunting success), species actually killed, wounded animals, locations and dates of animals killed, evidence of snare wounds on animals (added 1999), trophy sizes (following SCI measurement conventions), sex, number of baits (for baited species such as lion), non-hunted trophy animals seen, disturbances to the hunt, poaching activity, client opinions of their hunt and Zambia. The safari hunting dataset is one of the most robust datasets for two reasons. Safari hunting datasets are generally complete, because there are typically only 10-25 hunts per season (per hunting block) and safari hunters are legally required to be accompanied by a scout when hunting”.

Lyons (2000) valued this data as a means of calculating various indices:

- **Trophy quality.** Assuming that animals grow larger with age, and safari hunters are generally selecting trophy animals in the same way from year to year, trophy size is a fairly direct and valid index of the age of the oldest males in the population. This is reason enough to use

²⁷⁹ In 1999, Nyamaluma changed its name to the African College for Community-Based Natural Resource Management (Lyons, 2000).

²⁸⁰ Ian Manning (2006) states that, “other than in the Bangweulu and parts of the Kafue and Barotse wetland system, it is scientifically and economically not feasible to set scientific quotas (total counts with wide confidence limits) in Zambia; rather a ‘good farmer’ harvesting approach is required, based on a set of agreed age and trophy standards, to be monitored at the end of each hunting season, and then adjusted for the next season”.

trophy size as an important indicator, as the success of safari hunting is dependent on trophy specimens. In addition, changes in age structure can reflect changes in abundance in the population as a whole (Lyons, 2000).

- **Hunting success.** Hunting success is the percentage of safari hunters seeking a particular species that successfully found and shot an animal. Before each hunt begins, the village scout accompanying the client is supposed to ask which animals will be sought. At the end of the hunt, the animals actually taken are compared with what was desired to calculate hunting success (Lyons, 2000).
- **Hunting effort.** Hunting effort is defined as the number of days it takes a safari client to find and shoot an animal. When hunting effort increases, it implies that animals are more difficult to find, presumably because there are fewer of them. Hence, hunting effort is therefore also intuitively a good indicator of population change. However like the other indicators, the validity of hunting effort as a proxy for population change requires controlling for or at least averaging out other factors which may affect hunting effort (Lyons, 2000) such as chance encounters.
- **Number of animals hunted.** The total number of animals, which have been legally hunted, is an indication of the off-take from hunting. By itself, the number of animals successfully hunted may not be very meaningful, as it depends on a variety of factors (such as the number of hunters who wanted an animal). However when evaluated with other indicators, the trend is more likely to be valid. The number of animals hunted is also important because it represents the sample size for hunting effort and trophy size, and helps determine the magnitude of any changes in the quota (Lyons, 2000).

Additional data analyzed is poaching/snare records from field patrol surveys, crop damage reports and wildlife population trend surveys. It is also unclear to what degree the GMAs/CRBs have continued with this monitoring process now that Dr. Lewis, as a driving force, is no longer with ADMADE. What is also unclear is to what degree ZAWA used this information to set annual quotas? ZAWA (1999) indicated that this process was beginning but acknowledged that there was a need for greater inclusivity, especially of safari operators, in determining annual hunting quotas. According to Lyons (2000), one-day quota setting meetings of key stakeholders (professional hunter, tracker, community resource board, unit staff, scouts, and NPWS biologist) were held annually in each GMA.

According to Lyons (2000), the relative weight of indicators during group discussions are in descending order of importance:

1. Opinion of the professional hunter – most important (justifiable only if safari operator has long-term and secure lease, otherwise open to abuse for short-term gains);
2. Opinions of the tracker and the scouts;
3. Opinions of others at the meeting (e.g., ex-poachers); and
4. Hunting statistics – least important.

This data appears to never have been institutionalized into the now Zambia Wildlife Authority (ZAWA) headquarters at Chilanga. In 2001, when the principal author offered a basic course in wildlife monitoring in an attempt to institutionalize this process nationally through ZAWA, headquarters had not one piece of Lewis's monitoring data (Kapamba, Simwanza & Zyamboe, *pers. comm.*). If it has not already happened, it is suggested that they recover this information as it could have provided useful trend analyses. According to

Simwanza (2005b), ZAWA has begun developing a Wildlife Monitoring Information System to analyze data collected from a:

- Safari hunting summary form used to verify hunting success;
- Safari hunting daily record form used to determine hunting effort; and
- Trophy measurement form - for monitoring trophy quality.

Quotas are set using this information plus aerial survey data, where available, and poaching levels. A quota setting manual has been developed and one trophy-monitoring workshop has been held, training 35 game scouts from five GMAs. Training workshops for local communities have been undertaken and they are now involved in quota setting, though no numbers were given as to how many communities. In 2007, Edward Phiri, from ZAWA and a master's candidate at the Department of Nature Conservation, Tshwane University of Technology, plans to undertake a thesis that will institutionalize appropriate wildlife monitoring as a basis of quota setting. This is a move in the right direction and it is hoped that the process will evolve. ZAWA is to be congratulated.

Requirement for 75% Quota Utilization

Concern has been raised that Zambia's policy of requiring a 75% (now 56% - see below) use of hunting quotas for each GMA may encourage safari operators to over-harvest game, producing inferior trophies that could harm the reputation of Zambia as a safari destination (ZAWA, 1999) unless:

- Quotas are set correctly;
- Illegal off-take of animals or unusual mortality from natural causes are factored in correctly;
- Quotas once set are not increased by pressures from user groups; and
- Management controls are rigorously enforced.

According to Manning (2006), ZAWA hunting quotas have been set

“...chiefly, by the needs of the lease agreement and the 2003 ZAWA financial budget so...”. Manning (2006) goes on to say “the effect on GMAs when 56% of a quota must be shot by operators must impact negatively on the resource, especially as the illegal offtake is massive and unquantified. Of serious concern is that the 56% minimum offtake would in reality account for 100% of the keystone species on quota: lion, leopard and buffalo”.

9.7.7.3 Botswana Community Trust Program

The Department of Wildlife and National Parks (DWNP) undertakes periodic aerial surveys. It is unclear what kinds of statistical results are obtained since so far the principal author has only seen numbers without standard errors/deviations. Debbie Peake of the Botswana Wildlife Management Association (BWMA), who has a taxidermy dipping and packing company, which ships all trophies coming out of the major hunting areas of the Okavango Delta and Chobe, measures all trophies coming from her operation and in the early 21st century was working on a master’s degree using this information. It is unclear to what degree the DWNP has bought into using this data, since traditionally there has been friction and lack of trust between the DWNP and BWMA. Likewise, BWMA hired a South African researcher, Christian Winterbach, to study lion populations in the Okavango Delta. His findings indicate that the lion population is at saturation within the delta at between 1,189 to 1,668 lions²⁸¹, where until closure 12 trophies/year were harvested, which is 1% or less of the population (Winterbach, 1999 *In: SCI Africa Office, 1999*) – also see Section 9.6.3.4, Botswana Community Trust Program. Due to saturation in the delta, forcing younger males out of the delta into livestock areas, over 100 lion are shot per year as problem animals (SCI Africa Office, 2000a), which places the total harvest/year at about 6-9% as opposed to Funston’s estimate of 5% for the entire country in Section

²⁸¹ Note: Winterbach, *et al.*, 2001 estimate a population of Okavango Delta lion of 1,178 – 1,698 in 1999 compared to from 1,189 – 1,668 in 1998.

9.6.3.4, Botswana Community Trust Program. Ironically, the Okavango Delta is about the only area with a serious lion monitoring program, but as can be seen due to national and international politics, lion hunting was closed, though it used to be a major revenue generator for rural communities (see Section 9.6.3.4, Botswana Community Trust Program). As a result of CITES 2004, where the lion was featured (see Chapter 10, Section 10.8, THERE'S AN AFRICAN LION JUST AROUND THE CORNER), monitoring of trophy hunted lion and lion populations will significantly improve in Botswana and elsewhere as the outcome of a series of workshops on the subcontinent in 2005/6.

9.7.7.4 Tanzania

The Wildlife Division, through their research branch, undertakes aerial surveys, employing antiquated techniques with large standard errors. This makes the use of this information of questionable value for key management decisions such as quota setting. In the mid-1990s, a grant from the U.S. Fish and Wildlife Service was implemented by safari operator/wildlife biologist Rolf Rohwer in the Selous Game Reserve (SGR) (Rohwer, 1995; 1996). The goal was to institutionalize the collection of baseline wildlife monitoring data by safari operators at a more cost-effective and appropriate level. This concept was rejected by the operators, fearing among others that geographically referenced data might show them hunting in areas outside of their licensed concession or at the wrong time of the day or otherwise in violation of game laws (Rohwer, *pers. comm.*). Since it was not a legal requirement by the Wildlife Division, it failed. With regards to wildlife monitoring, sustainable utilization of Tanzania's wildlife populations faces the following challenges in the future (SCI African Chapter, 1996):

1. Unrealistic subdivisions of hunting blocks and multiplication of quotas by the Wildlife Department for short-term economic gains, without appropriate biological and ecological data to substantiate these gains; and
2. Guesstimate hunting quotas with no scientific validity that could lead to unsustainable utilization, both economically and ecologically. Often hunting blocks have quotas for game not in their area, while in other instances quotas are believed to be too low, decreasing the economic sustainability of the hunting blocks.

The backbone of the safari industry in Tanzania is the lion, leopard and buffalo, responsible for 42% of the trophy fees on which the Wildlife Division makes the majority of its income from hunting. Buffalo are the most important species, contributing 22.1% of the trophy fees, which represents 13.3% of the total Wildlife Division income (Baldus & Cauldwell, 2004).

Aerial surveys, currently the primary means of monitoring wildlife, are not able to cover all hunting areas due to cost and are unable to provide data on these three key species (Baldus & Cauldwell, 2004), lion and leopard because of their cryptic nature and buffalo due to non-random clumped distribution of herds that often require total counts even from the air. Deriving scientific estimates of lion and leopard populations requires detailed studies over several years and is not feasible to accurately measure populations in the vast extensive hunting blocks of Tanzania and most of Africa. Trophy quality over time has been measured in the Selous Game Reserve (SGR) since 1999 and is recommended countrywide along with trends over time in animal abundance and hunting success (Baldus & Cauldwell, 2004). In Tanzania, an average of 20,500 hunting days sold to 1,370 clients results in the harvest of 7,500 animals/year, representing 60 species, which makes the monitoring of off-take an enormous task. Both the Planning and

Assessment for Wildlife Management (PAWM) project funded by USAID from 1990 to 1995 and GTZ (Broomhead, 1997 *In: Baldus & Cauldwell, 2004*) recommended computerization and collection of wildlife management data that was rejected by the Wildlife Division.

“The WD (Wildlife Division) has twice resisted attempts to computerize the system. It is doubtful that in the absence of proper records management an adaptive management approach can be practiced (d)...There is a tendency for outfitters to be allocated their required hunting quotas, and that quotas are increasingly raised regardless of the population status. Hence, quotas are not based on ecological indicators but rather economic interests of a few powerful players” (World Bank, 2005).

Currently, the Wildlife Division relies on qualitative recommendations from project managers and district game officers as well as safari operators/professional hunters, opening the system up to unjustifiable quotas for short-term economic gains. “Some people allege that the Wildlife Division is purely a financially driven organization...” (Baldus & Cauldwell, 2004). The net result is the unsustainable hunting of key species where age and quality has declined (e.g., lion, buffalo) (World Bank, 2005)

“in part due to the lack of an objective system for quota setting for hunting, and many hunting quotas are issued that allow unsustainable levels of hunting. Hunting also takes place ‘above’ quotas” (DPG, 2005).

Data also suggests a decline in numbers of lion and leopard being hunted/year and/or quotas that are too high based on hunting success (only one in five clients takes a lion trophy) and the fact that only about 40% and 60% respectively of the lion and leopard quota are utilized each year (Baldus & Cauldwell, 2004).

Combined with computerization of the system, Baldus & Cauldwell (2004) recommend the following:

- Available data from aerial and ground census;
- Standard questionnaires completed by wildlife scouts accompanying clients on hunts on animal abundance, sightings, hunter success, etc.;
- Trophy quality, possibly age for lion and leopards; and
- Village scout data in Wildlife Management Areas (WMAs).

The “*Revised Draft Policy and Management Plan for Tourist Hunting*” (Department of Wildlife 1995 *In: Baldus & Cauldwell, 2004*) laid out the foundation for monitoring that has never been implemented.

Also according to Kibonde (*pers. comm.*), the Selous Game Reserve (SGR) is initiating a wildlife monitoring program of its off-take. According to DPG (2005), a tourist hunting (sport hunting) database for the Selous began in 1988 with the addition of hunting trophy quality monitoring in 1998. “The database (without trophy monitoring) has been expanded for game reserves in northwestern Tanzania” (DPG, 2005). In the Selous, game guards with each vehicle record harvest information such as trophy quality along with a GPS location of the harvest. The Selous is divided into eight sectors with three to five personnel/sector with diplomas in wildlife management plus a warden in charge/sector. The staff makes a 100% quality control check on all trophies to verify the game scout’s data. Currently, a person is being trained in statistical analysis and a university professor from Tanzania has been contracted to train the wardens in data collection and analysis (Kibonde, *pers. comm.*). What is not clear, is to what degree such information is being used to establish quotas.

Tanzania Game Trackers/Wengert Windrose Safaris, a hunting company in Tanzania, and Dallas Safari Club, an American sport hunting club, are funding two masters students from the Wildlife Division's technical branch, Tanzania Wildlife Research Institute (TAWIRI), in collaboration with the Department of Nature Conservation, the Tshwane University of Technology (TUT), South Africa. The goal is to develop and institutionalize an integrated program involving both aerial and on-the-ground data collection on wildlife utilizations and populations in hunting blocks. Modern distance sampling techniques will be employed to increase the reliability of the data. So far, only the aerial survey portion of this agenda is being met, with a reluctance to be involved in a systematic collection of ground data (e.g., trophy quality, hunter success/effort, herd structure and size, recruitment, poaching, etc.). Once again, the analysis of such data may not be in the government's interest as it goes for short-term and short-sighted economic benefits.

In mid-2004, Tanzania passed a law making it illegal to shoot any lion under six years of age, an age limit based on work undertaken by researchers such as Craig Packer, that if followed should help maintain healthy lion populations, assuming that other off-takes [e.g., Problem Animal Control (PAC)] are insignificant in and around the hunting blocks. The next step is to hold a workshop to identify key field indices that professional hunters can use to identify mature lions. The Wildlife Division will require various information such as photos and will personally measure skulls and look at skins in determining if they are legal to export (Oelofse, *pers. comm.*). In 2006, a guide for professional and sport hunters was published as an aid in judging a lion's age (Whitman & Packer, 2006). This should set a precedent for other Sub-Saharan African countries where lion is one of the most valuable species for the safari industry.

Demonstrating the importance of monitoring, a November 6-21, 2004 lion survey of Moyowosi's Njingwe South hunting block may justify the above concerns. The area surveyed included Moyowosi Game Reserve's Njingwe South area ($2,870 \text{ km}^2$) in the southern part of the game reserve. Using the calling a station technique, based on the area sampled with lion calling stations (614 km^2) the Njingwe South lion population is estimated at 91 lion or about 3.3 lion/ 100 km^2

"significantly higher than the general lion density given for the Moyowosi/Kigosi Game Reserves and surrounding areas. Elsewhere in Tanzania an average lion density of 15 lion/ 100 km^2 has been suggested for the Serengeti-Ngorongoro-Tarangire region and 8.0 lion/ 100 km^2 in areas such as Mikumi National Park and Selous Game Reserve (SGR)...No adult male lion were recorded although seven female lion were at the calling stations. Most of the lion (70.0%) were younger than 4 years, and only 3 (15.0%) were younger than 12 years. The oldest males were estimated to be about 3.5-4 years old. Lion considered being adults comprised 35.0% of lion recorded" (Viljoen, 2004).

Since 2002, the quota has been three lion/hunting season (Viljoen, 2004). The annual hunting quota of three lion amounts to 3 % of the population and is likely sustainable.

Subdivision of Hunting and Quota Multiplication without Scientific Basis

In 1965, when Tanzania's wildlife population was higher than today, there were 47 hunting blocks. By 1997, the number increased to over 140 hunting blocks. Baldus and Cauldwell (2004) use the figure of 141 hunting blocks. At the same time, the number of hunting companies increased from nine in 1984 (Nshala, 1999) to 42 by 2004 (Table 9.16):

Table 9.16: Growth in hunting companies, Tanzania

YEAR	NUMBER	SOURCE
1984	9	Nshala (1999)
1988	21	Nshala (1999)
1995/96	42	TAHOA (2001)
1996/97	35 [33]	TAHOA (2001); Nshala (1999)
1998	35	TAHOA (2001)
1999	35	TAHOA (2001)
2000	39	TAHOA (2001)
2004	42	Baldus & Cauldwell (2004)

Prepared by principal author

“The first time this idea (sub-dividing hunting blocks) was raised was in a PAWM²⁸² (Planning and Assessment For Wildlife Management) Workshop in 1993. Expatriate Experts, participating in this workshop, believed that there were many hunting concessions that were under-utilized and that sub-dividing them would allow greater use of the resources and allow more hunting operators to enter into the business. It was also believed that this would break the monopoly of the large operators (about 6 large at the time), and drop the price of hunting (at the time the highest in Africa and still the case) helping Tanzania to be competitive in the market place.

The safari industry immediately called a meeting with the Department of Wildlife and explained that all of this was theoretical, and that Tanzania could not sustainably support such utilization pressures on its game.

Ultimately, many of the PHs and safari operators interviewed believe that one or two big operators pushed for the break-up of hunting blocks in order to get hold of prime areas, especially access to the unique Maasailand species (e.g., access unique species such as the Lake Natron area famous for its lesser kudu and gerenuk). .

This was also exasperated by the fact that the Department of Wildlife must be self-financing, behaving like a parastatal. The government’s viewpoint was that by breaking up the hunting blocks and increasing overall quotas for a given geographical area, more money would come into the government” (SCI African Chapter, 1996).

²⁸² PAWM was funded by USAID (Barrow, *et al.*, 2000)

It is also believed that the breaking of this monopoly by a few big safari operators through the subdivision of hunting blocks was undertaken as part of the indigenization process, to get more black Tanzanians involved in the safari industry (SCI Africa Office, 2001a). Still, after all of this, about 90% of the safari hunting revenue in the mid-1990s was still being generated by five to seven foreign owned companies (SCI African Chapter, 1996). Baldus and Cauldwell (2004) recognize three major consortiums of hunting companies under common ownership holding 36% of all hunting concessions:

- Gerard Pasanisi, Barlette Safaris and Tanganyika Wildlife Safaris owned by Gerard Pasanisi, a French Corsican and family with a total of 20 concessions controlling 35% of the concessions in the Selous plus concessions in Open Areas adjacent to the Selous Game Reserve (SGR). In addition said to have one of the largest eco-tourism companies in Africa if not the World;
- Tanzania Game Trackers (TGT) – Wengert Windrose Safaris (WWS) Group owned by Tommy Friedkin of Texas with 15 concessions; and
- Tanzania Big Game Safaris, Tandala Safaris and Tanzania Safaris and Hunting Group owned by Raul Ramoni with 16 concessions.

Subleasing

A major problem is that many of the indigenous companies do not have the marketing skills and as a result sublease to foreigners, often South Africans. Up to 70% of the safari companies leasing hunting concessions sublease in various ways, accounting for up to 40% of the industry's income. It is estimated that 30% of the gross turnover from hunting never enters the country, fees being collected offshore by the foreign professional hunters subleasing. This would amount to an annual loss of from US\$ 8-11 million/year of the US\$ 27-39 million/year gross turnover of Tanzania's safari hunting industry from subleasing (Baldus & Cauldwell, 2004). As discussed, most of the indigenous safari operators were/are a political/bureaucratic elite who extract the wealth out of their area with little or

nothing going to rural communities and in some cases, worse, through subleasing allow over-shooting of their areas by unscrupulous foreigners for short-term gain.

Larger companies that tend to charge high daily rates and offer exclusive high product experiences also tend to deliberately under-utilize their quotas, while smaller companies with a poor client base tend to sublease, thus losing direct income. These marginal operations will tend towards over-utilization of wildlife by pushing for higher quotas, with little or no biological data to justify increases, increased turnover being their only way of generating adequate returns on their investment. The small companies sublease at US\$ 600-700/day to wandering professional hunters, while the wandering professional hunter charges the client US\$ 1,500-1,800/day resulting in a loss of US\$ 800-1,200/day that must be made up, helping explain the loss of FOREX to Tanzania. Increasing quotas for short-term gain is the obvious remedy. It is also estimated that in some instances, entire concessions are subleased at values of up to 20x the rate (in excess of US\$ 130,000/year) leased from the Wildlife Division that is currently fixed at US\$ 7,500/block/year (Baldus & Cauldwell, 2004). Block and concession fees increased significantly in 2007, likely decreasing private sector profits and increasing government profits (see, Section 9.6.3.6, SCP, Tanzania). There is much to be made of being an absentee landlord in Tanzania's hunting industry, but is it sustainable?

Subdivision of Northern Maasailand Hunting Blocks

For instance, the Northern Maasailand hunting concessions were first subdivided from two to six hunting blocks (SCI African Chapter, 1996; Wengert, *pers comm.*). Wengert Windrose Safaris had its two hunting blocks in northern Maasailand, Lake Natron and Mto-Wa-Mbu subdivided between five companies, TGT (Tanzania Game Trackers), Robin Hurt, Wengert-Windrose, Intercon and TAWICO (Tanzania Wildlife Corporation – hunting company) (SCI African

Advisory Board, 1997). Quotas in Maasailand went from (Wengert, *pers. comm.* In: SCI African Chapter, 1996) (Table 9.17):

Table 9.17: Subdivision of Wengert-Windrose Northern Maasailand hunting blocks, from 2 to 5 early 1990s and multiplication of safari hunting quotas without biological data

	<u>Prior to Subdividing</u>	<u>After Subdividing</u>	<u>Increase</u>
Lesser Kudu	9	56	6.2 x
Gerenuk	9	60	6.7 x
Grants Gazelle	15	200	13.3 x

Source: DeGeorges In: SCI African Chapter (1996)

In addition to safari hunting quotas, quotas were given for game capture and game cropping. Resident hunters were also given quotas. This is resulting in a major drop in trophy quality because of too high a harvest rate (SCI African Advisory Board, 1997). There was no scientific basis for this level of increase in quotas. It appears to have been an economically based decision and while some increase may have been acceptable, certainly not to the extremes as noted above (Wengert, *pers. comm.* In: SCI African Chapter, 1996). Franz Wengert (*pers. comm.*) believes that some companies overshot their quotas and then arranged to have their quotas officially adjusted upwards after the season was over.

Subdivision of Southern Maasailand Hunting Blocks

Beginning in the 1950s, there were only two hunting blocks around the Tarangire National Park (TNP), Southern Maasailand (DeGeorges, 1999b):²⁸³

²⁸³ Interviews were held with contacts at the outpost, Arusha, with former and active professional hunters who have a thorough understanding of issues from having actively hunted the blocks around Tarangire; as far back as 20 years ago. These include: 1) safari operator George Angelides, 2) former PH and commercial farmer - Michael Smalling (brother Marshall), 3) former PH and well-known sculptor - Dave Schaefer and well-known PHs: Steve Attwell, Andre Roux, Andy Wilkinson and Nigel Thiesen.

- Maasai Open Area
- Maasai Game Control Area (GCA) – no resident hunters allowed

These areas had no permanent hunting camps. Mobile tented camps would obtain a quota and take up temporary residence while hunting with a client and then move on.

Beginning around 1988, the Wildlife Division started sub-dividing the hunting blocks with these two blocks being turned into eight hunting blocks. The Maasai control area was subdivided into Lolkisale, Loibor Siret, Simanjiro West and Simanjiro/Kitiengare. The Maasai Open Area was divided into the Naberera, Mkungrunero, Makuyuni and Kondoa. As in the Lake Natron area, when subdivided, the old quotas were given to each of the new blocks, resulting in quotas being multiplied by as many as four times or more for short-term economic gain with little or no biological data to justify these subdivisions or to determine if they were sustainable. Such subdivisions of hunting blocks are not unique to Tanzania, but are believed to have happened in a number of countries for similar short-term economic gains with little or no biological data to justify these actions. According to Ruchaud (*pers. comm.*),²⁸⁴ this happened to hunting blocks in the Northern Province of Cameroon (see Chapter 5, Section 5.9.3.4, Over-population and livestock, a threat to wildlife in northern Cameroon). In 2005, Zambia also subdivided a number of hunting blocks, it is hoped for the right reasons and with appropriate data. However, high level donor contacts within Zambia, indicate the subdivisions were not based on adequate scientific data, being primarily for short-term economic gains (Anon 2006, *pers. comm.*).²⁸⁵

²⁸⁴ Rene Ruchaud, 10 Rue du General, DeGaulle, 85150 Vaire, France, Tel: 33-51-33-7127

²⁸⁵ According to Ian Manning (2006), “The 2004 ZAWA quota report stated that some hunting blocks had been subdivided and the quotas increased as ‘each hunting block must meet the requirements in terms of the minimum number of classical and mini safaris depending on its status.’ It further states that because all classical and mini safaris require a buffalo, ‘This in

Subdivision of Moyowosi “Njingwe” South Hunting Block

The Moyowosi, Tanzania, is a Ramsar (International Convention on Wetlands or “The Ramsar Convention” signed in Ramsar, Iran) wetlands site created among other reasons to protect the endangered shoebill (whale-headed) stork (*Balaeniceps rex*). Aerial surveys by the Tanzania Wildlife Conservation Monitoring Unit/TWCM, renamed Tanzania Wildlife Research Institute (TAWIRI), were used at the political level to split the Moyowosi South hunting block in two in 2001.

“Species such as sable, roan and buffalo are not evenly distributed and in cutting the block one of the blocks would contain sable and roan, while the other would contain much of the buffalo. Lion are already pressured and plans existed by safari operators to reduce the quota. Now the quota will be doubled. Aerial surveys conducted in 1990/1994/1998/2000 show a stable or decreasing trend in most game and an increase in human encroachment. There was a misjudgment on the size of the hunting area, plus the actual accessible area is quite limited, as much of the block is swamp. Aerial censuses of wildlife have large confidence limits. There were an estimated 350,000 Tutsi Refugees heavily impacting the southern section of the block. Cattle in the hunting area were estimated at 29,771, lower limit 7,999 and upper limit 51,543 in the 2000 survey. During the same survey, the buffalo estimate was 8,132 with a lower limit of 187 and an upper limit of 16,077 making this data...useless for setting quotas. The aerial census reports put out by the Tanzania Wildlife Conservation Monitoring Unit state that buffalo in the 1970s were estimated to be about 20,000 (TAWIRI, 2001 *In:* DeGeorges, 2001a *In:* SCI Africa Office, 2001a). Safari operators noted that 20 years ago there were

practice entails that the minimum number of buffaloes for a prime hunting block should be 12 and a secondary block, 8. Thus quotas have been prepared and adjusted with this situation in mind.’ Clearly, quotas are therefore massaged to meet the safari package requirements of Prime or Secondary areas in order for ZAWA to exact the maximum income”. This occurred again in 2005 and 2006 with further subdivisions to meet ZAWA’s short-term economic goals (Manning, 2006). ZAWA lacks “...the necessary scientific, managerial and operational capacity, and (is) guided more by the necessities of income generation over biodiversity conservation...” (Manning, 2006).

buffalo herds of 6,000 animals. Today, if one sees herds of 600 you are lucky" (Oelofse, *pers. comm.* In: DeGeorges, 2001a In: SCI Africa Office, 2001a).

Since then the block has been reconstituted into one. This subdivision of hunting blocks is believed to be having a major negative impact on trophy quality and in combination with other factors (e.g., human encroachment, poaching) potentially on the economic and ecological viability of game populations over much of Tanzania's hunting areas.

As a sequel, in September 2004, TUT graduate student Harley (*pers. comm.*) flew with TAWIRI personnel to undertake aerial surveys using more precise distance sampling. The safari operator (Oelofse, *pers. comm.*) thought the cattle had been removed. Harley (*pers. comm.*) estimates that there are only 1,000 +/- 300 buffalo and 22,500 +/- 2,500 cattle in the Moyowosi South hunting block. The biggest herd of buffalo observed was about 400. Once again, communities see little or nothing economically from wildlife, but place great value in the livestock, which has both economic and cultural value to them. Unless things change, one must expect that in the long run buffalo numbers will continue to decline in the Moyowosi and cattle numbers will continue to increase. Repression by safari operators and/or government will only slow the change. Until local people have a vested economic and psychological stake in this and many other natural areas across the subcontinent, wildlife and these natural systems face a bleak future. Conservation as currently practiced is failing Africa and Africans.

40% Quota Utilization Requirement, Tanzania

Similar to Zambia, with no appropriate scientific data, another policy which is believed to be very dangerous to the sustainability of safari hunting is the requirement for 40% financial utilization of the quota, rather than a 40%

utilization of the trophy quota. This is the minimum required in order to retain hunting blocks by a safari operator. In theory, this gives the safari operator the ability to rest game whose trophy quality may be deteriorating, as long the government receives minimum guaranteed revenue. This is fine except that most quotas are not based on scientific data and are believed to often be too high. Many feel that this results in over-shooting hunting blocks as opposed to shelling hard-earned money out of one's pockets for quotas that are abnormally high and thus putting undue financial burdens on the private sector (SCI African Advisory Board, 1997). The increasing number of buffalo, wildebeest and zebra hunted each year could be a reflection of pressure put on safari operators to meet the 40% rule while faced with declining lion and leopard hunts (Baldus & Cauldwell, 2004).

9.7.7.5 Attempts at institutionalizing appropriate wildlife monitoring in other Sub-Saharan African countries

With little success, the Tshwane University of Technology, South Africa, has also been trying to initiate a wildlife-monitoring program with Cameroon to institutionalize this process in both the forest and savanna hunting areas.²⁸⁶ Emphasis will be placed on using professional hunters, game guards and eventually rural communities who are on the ground to record field observations such as trophy quality, hunter success/effort, herd size and structure, recruitment and disturbances/encroachment such as poaching, itinerant agriculture, etc. This cost-effective information will be used to establish hunting quotas and to take

²⁸⁶ TUT, at its own expense flew down masters candidate Georges Mouncharou, head of Cameroon's elephant program and conservator of the new head of the elephant program for the country and the new head of the Mbam and Djerem National Park and doctoral candidate Assan Gomse, head of the Benoué National Park. Draft thesis proposals were prepared but never followed up by the two candidates. For the moment, the Cameroon program is moribund. A November 2005 visit to Cameroon by a TUT staff member tried to push this initiative forward with little success.

other interventions in assuring the economic and biological viability of wildlife populations. To date little is happening.

TUT is also working with Mozambique with goals of this program taking off in 2005. WWF held a trophy quality-setting workshop for the government and hunting industry in 2005. To date (early 2008). In this case, it is difficult to determine whether the problem lies with the individual and/or complacency by the key stakeholders (e.g., government and the private sector). An M-Tech student from Zambia's ZAWA plans a pilot trophy quality/hunting effort and success monitoring program (Phiri, 2006).

What has been described above regarding Tanzania's wildlife monitoring can be alleged for most of the government hunting bodies on the subcontinent. Cameroon, Mozambique and Zambia to date have failed to initiate countrywide programs. There is still concern across the subcontinent about how committed governments and safari operators are to basing trophy hunting quotas on biological data to assure both long-term economic and ecological sustainability as opposed to meeting purely short-term economic goals. Assuring long-term tenure and security over hunting leases to the private sector could go a long way in helping to get a buy-in from them. With more and more wildlife departments becoming parastatals and having to be economically independent, there is a strong risk that short-term economic goals will prevail even within governments, resulting in a potential abuse of wildlife resources. As discussed, structural adjustment policies (SAPs) that result in a countrywide economic decline also tend to encourage unsustainable harvesting of resources by all stakeholders. The next few years will be telling.

Concern is raised that the shortage of data by the hunting industry will in the future lead to mistrust from the international community at forums such as

Convention on International Trade in Endangered Species (CITES), Convention on Biological Diversity (CBD), and among national bodies such as the U.S. Fish and Wildlife Service or the EU (Baldus & Cauldwell, 2004).

9.7.8 Lack of Adequate Alternative Livelihoods

Where the natural resource supply is high and human demand is low, the need for control is low. When the natural resources supply is low and the human demand is high, the need for control is high. Factors such as 1) natural human population increases, 2) uncontrolled immigration, sometimes by outsiders moving into the area to obtain benefits from the natural resources and from areas in internal and regional civil strife, or 3) an absence of non-rural livelihood alternatives all pose a serious threat to CBNRM.

Sub-Saharan Africa is the only region of the world where the annual growth of gross domestic product (GDP) per capita has been negative, at -1.0% between 1975 – 1999, compared to 6.0% for East Asia and the Pacific and 2.3% for South Asia (Roman, 2003). Failing national economies and the lack of opportunity in the cities is resulting in the “politics of despair” in which rural dwellers who emigrated to the city “paved with gold” find no opportunity and are thus forced to return to the rural areas, often “mining” the natural resources in trying to survive (e.g., itinerant agriculture, extensive pastoralism, charcoal making, illegal hardwood cutting, artisanal mining, honey collecting, poisoning waterholes for fish and poaching). Thus, national macro-economic health and CBNRM are integrally linked.

The *Tchuma Tchato* Project in Mozambique has had major problems with uncontrolled migration of people from neighbouring areas looking for new opportunities and benefits. This immigration is the result of deteriorating

conditions in their areas of origin and also of the project, as it offers some jobs and minimal benefits. Moreover, floods in 2001 as well as changed hydrological management practices at the Kariba and Cahora Bassa Dams provoked the inundation of fertile lands along the lake, forcing people to move to safer areas close to or on animal routes. In the district of Zumbo, nine cases were reported of people killed by animals, mainly by elephants and hippopotamuses. The real number is probably higher since most cases are not reported (Nimpuno, 2003). The safari operator has complained that this in-migration and settlement of people is interfering with buffalo migratory routes (Hougaard & Rouget, *pers. comm.*).

As an example, the 1994 Rwanda genocide, forced thousands of Tutsi across the border into northwestern Tanzania into refugee camps that placed tremendous pressure on forests for fuelwood and wildlife for food. The civil war in the DRC forced hundreds of thousands of internally displaced people (IDPs) into national parks cutting firewood and poaching to survive (see Chapter 13, Section 13.10.3.7, Impacts on biodiversity).

9.7.8.1 Politics of despair, Zambia

The following mini-case study demonstrates how a combination of 1) traditional beliefs of hunters and 2) a lack of opportunities in urban centers can push people back into rural areas, doing whatever it takes to survive, even if this means mining wildlife and other resources for short-term survival needs (DeGeorges, 1992a).

While the principal author was visiting the Munyamadzi GMA during an evaluation of ADMADE for the Zambian government and USAID in 1992, four poachers were brought into the camp by the village scouts. The ringleader was an old man in his 60s. His history might be considered as typical of many “poachers” who today transition back and forth between urban and rural areas. He started his life as a miner in the Copper Belt of Zambia. He claimed that as a miner he often “dreamed” of hunting, which might be interpreted as a dream summons from his ancestors. He

was involved in a mining accident and returned to his home in the vicinity of Mpika in order to rehabilitate. While there, an elephant got into a field and his uncle gave him a muzzleloader with which he killed the elephant. He reported this incident to the chief and was given the meat. After a month of recuperation, he returned to the mines. This was 1965.

In 1972, he stopped working in the mines after a number of near fatal accidents that caused him to fear for his life. He began hunting for the pot after that. He met a businessman near Ndola who had an elephant license and who hired him to go into the Machiya Fungulwe GMA to shoot his elephant. He did this twice, finding out how lucrative elephant hunting can be. He began purchasing his own elephant licenses from Lusaka and shooting elephant in order to sell the meat in Lusaka. He did this three times.

Then in, 1974, he joined a "Senegalese poaching ring" that smuggled ivory. He worked with them through 1986 when the Senegalese were thrown out of the country. He had been caught several times in the Munyamadzi GMA, as recently as January 1992. He claimed that if he was not in the bush for two to three months, his body stiffened and that he got the urge to hunt. If he could get a job like going with the scouts, it would make him happy and keep him busy. He explained that if put in jail for two years, he would likely return to poaching on his release. Three young boys apprenticing under him were urban poor:

- The 17 year-old said he didn't know what he was getting into and that he only went along because he had been told to do so;
- The 19 year-old had been poaching with the old man since 1987; and
- The 23 year-old had been poaching with the old man since 1991.

This is the first time any of these young men had been caught for poaching. The game scouts, who were interviewed throughout the evaluation, agreed that prison was not the solution. As a number of them said, "We have one of two choices, either shoot them or help them find viable long-term employment". This same

statement was echoed to the principal author while in the Fouta Djallon Mountains of Guinea-Conakry, with traditional Fulani *marabou* lion and leopard hunters.

9.7.8.2 “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”

“The alienation of indigenous peoples by conservation authorities has been reinforced by the sharp discontinuity that has developed between the social and economic situations inside and outside African nature reserves. Nature reserves (today 21st century) generally represent active economic centers with high income-generating potential based on sustainable land-use practices. In contrast indigenous people surrounding nature reserves generally have low income-generating potential, and are poorly educated...As population numbers increase and the demand for resources grows, the frequency and intensity of conflict between protected areas and local indigenous people will increase ”(Venter, Breen & Marais, 1994 *In: Fabricius, et al.*, 2001).

Southern Maasailand is another fine example where people, flocking back out of the urban centers, who undertake charcoal making, commercial bushmeat hunting and farming among others, are risking the future of wildlife in this area. This immigration, along with changing land use practices is threatening the entire Simanjiro/Tarangire Ecosystem of Southern Maasailand, Tanzania.

The following is extracted from DeGeorges (1999b). Interviews were held with former and active professional hunters who have a thorough understanding of issues from having actively hunted the blocks around Tarangire as far back as 20 years ago. These hunters include: 1) safari operator George Angelides (company sold in 2003), 2) former PH and commercial farmer - Michael Smalling (brother Marshall), 3) former PH and well-known sculptor - Dave Schaefer and 4) well-known PHs: Steve Attwell, Andre Roux, Andy Wilkinson and Nigel Thiesen. For many reasons, game populations are estimated by most people to be 10% of what they were ten to 15 years ago in this Southern Maasailand area. The decline

in game numbers and trophy quality includes: buffalo (*Syncerus caffer caffer*), lion (*Panthera leo leo*), leopard (*Panthera pardus pardus*), gerenuk (*Litocranius walleri*), lesser kudu (*Tragelaphus imberbis*), Cokes hartebeest (*Alcelaphus buselaphus cokei*), fringe-eared oryx (*Oryx gazelle callotis*), southern Grant's (*Gazella granti granti*) and Thomson's (*Gazella thomsoni thomsoni*) gazelles.

In the simplest terms, the 2,642 km² Tarangire National Park (TNP), gazetted in 1957, is a dry season grazing area for wildlife. In the past, it was also a dry season grazing area for the Maasai cattle, one reason why many Maasai are alienated from this park (see Chapter 3, Section 3.8.4, Land Compression and the Maasai of Kenya and Tanzania). It can be said to be an incomplete ecosystem. The rainy season dispersal area on the Maasailand outside of the Tarangire National Park (TNP) is critical to the wildlife populations in the park, similar to the Serengeti, Maasai Mara and Amboseli. Wildlife spends up to six months of the year in these dispersal areas (Kangwana & Ole Mako, 1998), drops and raises its young. Without these rainy season areas, the numbers and diversity of wildlife would be greatly diminished and dry season habitat would be degraded by game remaining year-round in the park (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya). It is estimated that 90% of the Tarangire Ecosystem grazing area is outside of the park. "Corridors" or migratory routes east of the park, going into game control and Open Areas, are being lost from human encroachment. Similarly, though believed to be less affected, human encroachment is also impacting the western migratory route. The net result is that game populations, both within the park and in the hunting areas to the east, have been greatly reduced.

Beginning in 1988, the two hunting blocks around the TNP, the Maasai Open Area and Maasai Game Control Area (GCA), were subdivided into eight hunting blocks, the quota increasing about four times (DeGeorges, 1999b) (see Section

9.7.7.4, Tanzania). Major reasons for game population declines and/or conflicts between humans and wildlife include the following, not necessarily in order of priority:

Agricultural/Pastoral Related

- Agriculture - Maasai selling off land within hunting blocks to commercial farmers
- Squatting by subsistence farmers;
- Over-grazing by Maasai cattle, goats and sheep – exceeding carrying capacity and competing with wildlife for food, water and space;
- Uncontrolled and unplanned placement of boreholes for livestock by religious groups, which are mismanaged and are resulting in desertification;
- Migratory routes northwest to Lake Manyara and east to Lolkisale/Simanjiro affected by human habitation/encroachment;
- Disease such as rinderpest has affected buffalo and greater kudu, while malignant catarrhal fever (MCF) has impacted cattle when they come in contact with wildebeest and wildlife carried tick-borne diseases; and
- Predation of livestock by lion and human attacks by buffalo (Kangwana & Ole Mako, 1998).

An increase in competition for land and resources in Tanzania has grave implications for both wildlife and people. In fact between 1967 and 1988, the human population of the Tarangire-Manyara ecosystem experienced a growth rate of 8.2%/year (Maliti, 2007) versus a national rate of 2.9% (see Section 9.6.1.2, Kifluku Farm, Laikipia, Kenya). Wildlife populations have experienced drastic declines while livestock populations have increased. Based upon aerial surveys by TAWIRI, wet season populations of the most numerous wildlife in the

Tarangire-Manyara ecosystem, wildebeest (*Connochaetes taurinus*) concentrated largely in the Simanjiro plains east of the park during this period, have declined from a high of 43,539 in 1988 to 5,257 in 2001, while cattle have increased during the same time frame from 53,828 to 240,842. This latter figure is ten times higher than the most abundant wildlife species in 2001, the zebra at a wet season population of 25,280 (41,073 in 1988) (Maliti, 2007). In addition,

“important corridor and dispersal areas east of Tarangire National Park, experienced almost complete clearance of woodland from 1995 as consequence of the expansion of smallholder cultivation, an expansion that has continued to the present day” (Maliti, 2007).

Farm plots increased from 1,051 in the wet season of 1988 to 49,114 during the wet season of 2001 in the Tarangire-Manyara ecosystem, largely in the Simanjiro plains (east of Tarangire National Park (TNP), impacting the migratory routes of wildlife, especially wildebeest (Maliti, 2007). Kwangwana and Ole Mako (1998) state that in the Loibor Serit area, 90% of the people interviewed in 1997 wanted the size of Tarangire National Park (TNP) reduced due to land hunger as described above. They argue, as this case study, demonstrates that

“efforts at benefit sharing cannot be seen as a replacement for initiatives to minimize the problems people incur in living with wildlife. People reported the same problems of living with wildlife in 1997 that they reported in 1992, and there was little evidence of a concerted effort to address these...Contrary to much current CC (community conservation) theory which posits that wildlife will be conserved to the extent that it provides ‘economic’ benefits, conservation in TNP appears to be dependent on a complex and dynamic interaction between cultural values, livelihood issues, human relationships and economic benefits...An increasing amount of land is being cultivated to the east of the Park, expanding the range of conflict between agriculture and wildlife. The single most important issue determining conservation possibilities in and around TNP is landuse”.

Even to the West of the park in 1999 the principal author observed village huts right up to the park entrance, something that did not exist in 1992 when he had last visited the area. With similar adverse impacts on wildlife populations, human encroachment has nearly eliminated wildlife corridors in the Ngorongoro Conservation Area (NCA) (Estes, Atwood & Estes, 2006).

Hunting Related

- Uncontrolled resident²⁸⁷ hunting, often commercial poaching for the bushmeat trade;
- Farm abuse: game cropping in the name of PAC animals for the bushmeat trade;
- Grass roots commercial poaching for bushmeat trade, even by Maasai, both in and outside the park;
- Revenge killing by Maasai out of anger from little or no benefit from wildlife that competes with their livestock for pasture and space;
- Unrealistic hunting quotas;
- Abuse of quotas by PHs;
- PHs hunting in someone else's block; and
- Unrealistic game cropping quotas by the Tanzania Wildlife Company (TAWICO).

Western (2005 *In:* Lyman & Child, 2005) sums up the feelings of the Maasai best.

“Maasai exclusion from any share in tourism, and the huge losses they suffered from wildlife, was fast eroding their traditional tolerance and making enemies where wildlife could least afford it.

²⁸⁷ In Tanzania, resident implies citizen hunters, usually from the cities, where in Zambia a resident hunter is a local from within a game management area, and a non-resident is a citizen usually from the city.

Wildlife had, in the words of the Maasai, become government cattle rather than their fallback reserve in droughts”.

Although based on his experiences around Amboseli, Kenya, it equally applies in Tanzania and much of the rural communities of Sub-Saharan Africa.

Other Human Activities

- Gemstone (tanzanite) mining and associated poaching; and
- Charcoal making resulting in habitat loss

In addition, a problem is presented by the drought affected migration pattern in recent times.

The feeling was that wildlife is competing with all of the above commercial activities. Professional hunter Andy Wilkinson²⁸⁸ from Zimbabwe coined the term “politics of despair”. There is no work in the urban areas, so people are coming back and making a living off of the natural resource base in any way they can. Most of the invaders into Southern Maasailand are non-Maasai such as Chaga, Warusha, Warangi and the Wapare (Mbarnoti, *pers. comm.*). This invasion is happening all over Maasailand.

Even the Maasai are turning to farming out of desperation. Lendii (2004) explains how Maasai women in Northern Maasailand, out of desperation, are clear cutting dry forests working for a month to obtain wages that sustain them for a week.

²⁸⁸ Andy Wilkinson, 6 Farnborough Close, P.O. Box Borrowdale, Harare, Zimbabwe, Professional Hunter working in Tanzania and RCA

As described in Chapter 3, pastoralists such as the Maasai and Barabaig, and hunter-gatherers including the Dorobo have been forced to survive on smaller and more confined areas each year. This is especially a problem in what is called the “northern tourism circuit;” the areas of Serengeti, Ngorongoro, Lake Manyara, Tarangire, Arusha and Kilimanjaro. Much of this region, including the protected areas, was once Maasailand (and grazed under nomadic herding practices) or customarily held by other local groups. With the formation of parks and other protected areas, many people were dispossessed of land and resources, including pasture and water, central to their livelihood and well being. These conditions have resulted in considerable human-wildlife conflicts. Keeping traditional migratory routes open between parks and protected areas, which tend to serve as dry season grazing areas, and rainy season dispersal areas, is believed critical to maintaining healthy wildlife and habitat in the parks. Wildlife buffer zones to maintain these corridors and dispersal areas in the form of Wildlife Management Areas (WMAs) with corresponding benefits to local people are considered critical (Shauri & Hitchcock, 1999). As noted, Igoe & Croucher (2001) found that to date in Southern Maasailand, WMAs that in theory should benefit local people, fail to do so miserably, further disenfranchising Maasai from their land and resources, and alienating them from so-called conservation. A key question that remains to be answered is if these “high altitude grasslands” can compete with agriculture, especially wheat, corn/maize needed to feed the ever-growing human populations of East Africa (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya), and the spread of commercial farms for seed-bean export (Maliti, 2007).

As for the young Maasai *morani*, they see no future for themselves as pastoralists. After Standard 7 (ages 13-15), the majority leave school (completion of Standard 14/Form 6 would be a high school degree) and work in the tanzanite mines.

Many young Maasai males, including those from Simanjiro, are leaving in hordes for the bright lights of the big cities such as Arusha and Dar es Salaam to find work as *askaris* (watchmen) (Mbarnoti, 2003; 2004; Lendii, 2004) (see Chapter 5. Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya). In both instances, they are poorly paid and most are unable to support a family. Being without an education and seeing little future in the subsistence wages most of them earn, they reinvest what little savings they have back into cattle, even though they know that there is little future in pastoralism. However, they see no alternative solution. Thus, as part of the urban poor, they continue to contribute to the degradation of Tanzania's rangelands. These young men are falling back on a support system, pastoralism, which, as currently practiced, is not sustainable in over-crowded Southern Maasailand (Mbarnoti, 2003). What is the future for these once proud people who feared neither humans nor beasts while wandering the plains of East Africa with their livestock, co-existing in relative harmony with wildlife? Plans are to turn this area into a wildlife management area (WMA) and to develop a land use management plan, which identifies and protects critical wildlife habitat.

However, safari operator Ridge Taylor (*pers. comm.*) is concerned that it may already be too late for a land use plan to conserve these WMAs. Due to administrative subdivision of the area, the hunting block of Loibor Siret will soon be divided in two by a hard top road that will accommodate access by small-scale farmers and poachers. This hunting block could soon become a "paper tiger" with little or no game. In addition, the Maasai already lost the Mukingonaro Game Control Area (GCA) to the Tarangire National Park. There is concern that the Maasai spear many animals, including lion in Loibor Siret, as a form of "revenge killings" because of fear that they may also lose this area to the park, if it is not already being lost to small-scale farmers. Mbarnoti (2004) explains that out of

anger for having been compressed into areas that can no longer sustain them, while given no viable option for a sustainable future, the Maasai are not only spearing wildlife, but also collaborating with poachers seen as

“allies in reducing the number of wildlife as livestock competitors, wildlife being seen as the cause for their loss of land by establishment of protected areas which do not benefit the Maasai. Pastoralists understand that laws are formed and practiced for the interest and benefit of the wildlife management authorities and not from a mutual relationship. They see the laws as biased and marginalizing them”.

In January 2007, lion following wildlife dispersing out of Tarangire National Park attacked the cattle boma in the village of Loibor Siret. This was reported to TANAPA game guards but no action was taken. After the second attack, the village poisoned 16 lions (Mbarnoti, *pers. comm.*). One can be sure this is happening daily, throughout Sub-Saharan Africa. Similarly, Holmern, Nyahongo & Roskaft (2007) found “revenge killings” of carnivores around Serengeti National Park strongly correlating with livestock depredation of livestock, and can be considered a poor response by government, and little or no benefits from trophy hunting reaching local people that might possibly change attitudes.

Thus, unless wildlife can compete with these other commercial activities and it is in the interest of the rural populations to conserve wildlife (e.g., obtaining full user rights both consumptive and non-consumptive in the form of WMAs), wildlife populations will continue to decline at the alarming rate we are seeing and the word going around, “Hunt Tanzania while you can”, may not be too far from the truth.

Since the mid-1980s, Tanzania National Parks (TANAPA), as part of the *Ujirani Mwema* (good neighborliness) program, has established a community conservation service. In collaboration with the African Wildlife Foundation

(AWF)'s Community Conservation Service Center (CCS) in Arusha, a community development program has also been established, based on sharing profits from tourism with the local community (Kangwana & Ole Mako, 1998). According to Barrow, *et al.* (2000), TANAPA has taken ownership of the CCS. However, one must question its effectiveness, given the information in this case study and the devious way in which AWF has dealt with Maasai communities in establishing WMAs (see Section 9.6.3.6, SCP, Tanzania). A major problem with TANAPA is that human activities such as settlement and cultivation, mainly in the surrounding Controlled Hunting Areas (CHAs), are administered by the Wildlife Division of the Ministry of Natural Resources and Tourism (MNRT).

“TANAPA operates in an institutional landscape that does not give it a strong mandate to work outside national parks, even though between 1992 and 1997, US\$ 93,800 was distributed to peripheral communities mainly for schools, health services and clean water” (Kangwana & Ole Mako, 1998).

There are also conflicts between safari operators and eco-tourism operators. Since these Game Control Areas (GCAs) and Open Areas are currently not Wildlife Management Areas (WMAs) where communities can benefit directly from hunting revenue through joint ventures with safari companies, photographic operators have moved in along the eastern borders of the park and made agreements with local communities to disallow hunting, even though the Wildlife Division has awarded hunting contracts to these companies (Taylor, *pers. comm.*). In 1990 and 1993, the communities took in US\$ 16,670 from eco-tourism, which though very little income per year, is 100% more than they get from hunting (Kangwana & Ole Mako, 1998).

Similarities between Southern Maasailand and Loliondo Game Control Area (GCA), Northern Maasailand

Nelson and Ole Makko (2005 *In: Lyman & Child, 2005*) demonstrate a similar conflict between different conservation philosophies in the Loliondo Game Control Area (GCA) of Tanzania, where the village government of Ololosokwan brings in about US\$ 55,000 annually from non-consumptive photographic tourism²⁸⁹ and is reluctant to devolve this authority to a higher level community based organization (CBO) as part of the WMA process that could deprive the village level institution and its 3,500 residents of both power and income. Additionally, there is a lack of trust in the Frankfurt Zoological Society, pushing the WMA process, since they are linked to the removal of Maasai in the creation of the bordering Serengeti National Park, as well as nearby Ngorongoro Conservation Area (NCA), and one can be sure that they are aware of the recent AWF attempts to remove people in creating Southern Maasailand WMAs .

This also appears to be linked to the government holding off on the rapid transformation of game control and Open Areas into WMAs (see 9.6.3.6, SCP, Tanzania). Since communities receive no benefits from hunting, they are leasing their lands across Maasailand to eco-tourism operators. This contravenes the Wildlife Division's Tourist Hunting Regulations of 2000, which do not allow eco-tourism activities in hunting blocks. This is seen as a power struggle between national and local governments versus rural communities over who benefits from natural resources. It is also an administrative conflict where hunting blocks cut across village lands as declared under the Local Government Act of 1982 and in which village councils can create bylaws to zone and manage their lands (Nelson,

²⁸⁹ In 2002, the village of Ololosokwan earned US\$ 64,287: US\$ 58,866 (92%) from tourism, US\$ 3,000 from hunting, US\$ 832 from district council funds and US\$ 1,586 from other. Although not a WMA, a member of the royal family from the United Arab Emirates, under the name of Orthello Corporation that has the Loliondo Game Control area, pays each of the six villages in this area an annual fee (Nelson & Makko, 2005 *In: Lyman & Child, 2005*).

2004; Nelson & Makko, 2005 *In: Lyman & Child, 2005*). While in the case of Taylor (*pers. comm.*), eco-tourism impacted his ability to hunt, Nelson (2004) and Nelson and Makko (2005 *In: Lyman & Child, 2005*) also demonstrate that hunting can negatively impact eco-tourism, since many eco-tourism groups avoid coming into areas during the peak-hunting season. In Botswana, safari operators are obliged to have both hunting and eco-tourism lodges. Similarly, in South Africa, dual activities are successfully carried out on both private (e.g., Zulu Nyala Lodge) and public (Pilanesberg and Madikwe Parks) lands. The real issue is not whether this dual use can be successfully undertaken, but who benefits and who controls land use!

9.7.8.3 Need for non-rural livelihood alternatives through industrialization

As demonstrated in Chapter 5 on agriculture and from the benefits/household ratios in most CBNRM schemes (see Section 9.5, SUCCESS OF CBNRM BASED ON CONSUMPTION AND COMMODITY PRODUCTION), the conservation community has to be honest with itself that rural Sub-Saharan Africa has exceeded its carrying capacity for providing a minimal quality of life for the average person. Even if communities obtain the majority of income from safari hunting or eco-tourism as suggested in Section 9.7.6.5, “Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders”, it would not significantly improve livelihoods for most people in rural Sub-Saharan Africa. Take CAMPFIRE as an example. Even if the US\$ 15 million earned over 11 years was tripled to US\$ 45 million, at the household level this would amount to an increase from an average of US\$ 18.60/household in gross revenue to about US\$ 46/household assuming household numbers are static at 95,000 (Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa), which we know is not the case as Africa’s population will more than double in 50 years (Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL

PRODUCTIVITY). In other words, human populations are completely out of balance with Sub-Saharan Africa's natural systems, if the majority of the populace is condemned to live subsistence lifestyles, eking out an existence as itinerant farmers and pastoralists or even trying to earn a living from wildlife. These ways of life are quickly disappearing, as pointed out in Chapter 5 on agriculture and Chapter 6 on boreholes and pastoralism.

We have to be honest with ourselves that CBNRM on its own will not work. Turning 10% or more of each Sub-Saharan Africa country into protected areas is a short-term solution destined to be engulfed by a wave of poverty. Given current rural populations, this creates more poverty as it continues to disenfranchise rural communities and compresses them into already over-populated areas that cannot sustain them, accelerating environmental degradation outside of the protected areas without giving them a viable and sustainable escape route other than into urban slums. This places rural Africans in a downward spiral economically and ecologically that forces them to encroach on and poach in the very natural areas the world wishes to conserve.

CBNRM and the creation of protected areas can be part of the solution only if the majority of the wealth from these areas goes to rural community-owned companies and they pay taxes like all companies, but even this on its own will fail! Such paradigm shifts must fit into a larger plan for the subcontinent, which among other things must relieve pressure on the rural resource base.

Yes, Africa has exceeded its carrying capacity to support people living traditional lifestyles, like it or not. If tomorrow, Europeans and Americans decided that instead of being mostly urban, the majority of the population should return to the soil, they would be faced with a similar problem: not enough land or other resources.

Hara (2004 *In: Fabricius, et al.*, 2004) explains how IMF/World Bank structural adjustment policies (SAPs) resulted in the collapse of local manufacturing industries and the shrinking of the manufacturing sector, forcing people to turn back to living directly off of the natural resource base in Malawi, especially the fisheries (see Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”). This placed undue pressure on the resource base and made the co-management of fisheries between government and the fisher community very difficult. Hara (2004 *In: Fabricius, et al.*, 2004) explains that the success of limiting access to a resource will depend on the general economy acting as a sink of excess labor. As long as employment in other economic sectors remains low and living directly off of natural resources (e.g., soil, wildlife, fisheries, forest and non-forest products) remains the main source of livelihoods, as opposed to transformed natural resources in industry and agro-industry, attempts to assure the sustainable use of resources will be difficult and co-management or sustainable management through devolution of authority to rural communities is unlikely to be successful. As discussed in Chapter 5 on agriculture, Sub-Saharan Africa is stuck in “Phase I”, where too many people are directly dependent on living directly from the soil and other resources. Given the population explosion of the 20th century and the fact that the current population is expected to more than double again by 2050, conservation, be it CBNRM or fortress conservation, is doomed to failure on its own.

What this means is that Africa must industrialize and urbanize and that these processes must be part and parcel of the “big picture” conservation and development plans. Like it or not, the romantic days of the Maasai *morani* walking fiercely across the African plains in his red robe and spear or the Bushmen stalking gemsbok and eland with their poisoned tipped arrows are on their way out. While a small portion of individuals within these cultures will be able to continue leading these traditional lifestyles, if they so choose, there is not enough land nor enough wildlife, pasture, soil, fish or timber for the vast majority

of Sub-Saharan Africans to sustainably live from as in the past; not without destroying the land, its resources, and eventually themselves, which is happening as we speak. The same happened in America. The principal author's mother had 11 brothers and sisters who grew up on a farm in the Appalachian Mountains of Maryland. One sibling was able to farm full time, two farmed part time and the remaining eight earned a living in a suburban environment. The principal author has over 33 first cousins and only one farms full time, the rest being doctors, lawyers, nurses, teachers, etc. Sub-Saharan Africa will have to go through this same evolution if its natural systems are to survive and its people are to have a viable future.

Most of the youth in Africa realize that the future in these rural areas is bleak. The young from all over Africa are “speaking with their feet”, heading to the big cities, many to the promised land, industrialized South Africa, which is being overwhelmed with illegal immigrants and an unimaginable level of crime since the “have-nots” are the majority and increasing in leaps and bounds (see Chapter 5, Section 5.7.5, Food Security and Urbanization in Sub-Saharan Africa and Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife, Impact Of Land Reform On Regional Economies). In September 2003, the principal author hosted the Senegalese national shooting team at his home, while they were in South Africa for the African Championships. Dakar is a Peninsula, so traffic bottlenecks as it enters the capital. It was explained that the problem of immigration from the rural areas is orders of magnitude greater than when the principal author was there in the mid-1970s until the late 1980s. Environmental conditions in the rural areas, as discussed in Chapters 5 and 6, have deteriorated and the youth are heading to the bright lights of the big city, no longer being prepared to tolerate groveling in soils, which no longer produce.

Similarly, the Maasai from Kenya are giving up traditional pastoralism for life in the cities as *askaris* or selling tanzanite; there is just not enough land for them all to have cattle. About four years ago on a trip to Tanzania, the principal author sat in a plane half full with illegal Tanzanian males being returned by South African immigration officials. The principal author experienced the same back in 1974 in El Salvador, the most populated country in the Americas, when a young worker at the fish culture station said,

“We have a saying. When the ship sinks the rats will swim, and I am getting the hell out of here. I am going to the ‘promised land’ - your country, where I can share a room with 5-10 people and make a US\$ 1.25 (today US\$ 5-7) an hour instead of a day. I will send money home and my family will be prosperous. The beautiful thing about your country (like South Africa) is if I get caught, America will give me a free plane ride home to visit my family. I will stay there for a few months on vacation and then return. I mean, what have I to lose”.

Europe faces similar uncontrolled immigration from its neighboring African continent due to failed economies and failed states in Sub-Saharan Africa.

South Africa wake-up! In a continuation of a letter from a Tshwane University graduate in nature conservation handpicked by CAMPFIRE and then residing in Chiredzi, Zimbabwe with a collapsed economy as a result of the radical land reform beginning in 2000 (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife) he wrote,

“Due to the situation I am in, I sometimes think of crossing the border to RSA, hoping that I may get employed as a laborer to sustain my life because I am currently in danger...I cannot hide my desperation to you because doing so is the same as killing myself” (Steyn, 2005).

Mr. Steyn is back at Tshwane University in 2007, studying for a B-Tech in nature conservation. His plans, for the moment, like many Zimbabweans, are to sneak his wife and child into South Africa and remain there until there is regime change!

One can be assured that there is a direct relationship between failed economies/states and declining wildlife numbers on the subcontinent.

While this rural-urban immigration probably needs to be encouraged, most of the youth are improperly trained to be easily absorbed into an urban environment. Additionally, the urban settings in Africa have neither the jobs nor the infrastructure (e.g., adequate homes, sewage, water, electricity, etc.) to provide a decent quality of life for these rural immigrants to Africa's big cities. That is why, as discussed under "politics of despair", many youth are returning to the rural areas, enough anyway to cause concern for the sustainable management of natural resources. They had hoped that the streets in the big cities would be paved with gold but they were not, at least not for the uneducated majority and in most cases even the educated minority! Many stay as hangers on, but many return to their rural homes and become part of the problem, mining the remainder of Africa's resources.

Africa, you have to stop allowing your raw products to be shipped overseas where the added value of transformation is obtained and the processed products are then shipped back and sold to you at higher prices than they were purchased. Africa, wake up! The foreign aid given to you is orders of magnitude below what you can get from urbanizing, industrializing and transforming your continent, as did Europe and America in the 20th century. It is your only hope for your economies, your people and your natural resources. This is discussed in greater detail in the chapters on foreign aid, structural adjustment (SAP) and the private sector, Chapters 11, 12 and 13, respectively.

Up until now, there are two main sets of resources that the West has wanted out of Africa, 1) minerals (petroleum, gold, cobalt, COLTAN, diamonds, bauxite, platinum, etc.) and 2) the experience of “Wild Africa” - the Big 5 (elephant, lion, leopard, rhino and buffalo) and the wide open empty spaces of the continent, either through hunting or eco-tourism. The minerals have tended to be taken out raw and the added value of transformation obtained in the industrialized world.

Even with tourism and safari hunting, because the vast majority of the companies are expatriate-owned and operated, a high percentage of the economic benefits from safari hunting remain “offshore”, never touching the soils of Africa. Africa’s parks and hunting blocks have become a playground for the Western elite who spend a couple weeks every few years to experience primeval Africa, escaping back to their air-conditioning, microwaves, computers and big-screen TVs, while the quality of life of most Africans goes nowhere but down.

While wildlife linked to CBNRM programs may be able to serve as a catalyst for development by providing healthy well-educated children, if the West wants to continue to experience “Wild Africa” and if the international conservation community as well as African states wish to see the biodiversity of the continent maintained, then the West will have to change its approach to dealing with Africa. Elimination of policies that negatively impact trade and the industrialization process in Sub-Saharan Africa such as IMF and World Bank structural adjustment policies (SAPs), as well as control of world commodity prices to the advantage of the West, agricultural subsidies, food and product dumping, protected markets, tariff controls and import quotas, etc. will become critical to the future of the continent, its people and their wildlife. Until the West’s approach to dealing with Africa is “win-win”, America and Europe, do not count on your grandchildren

seeing wild animals in Africa; though maybe they would in future be able to do so on an exotic game ranch/farm in Texas!

Most importantly, the West will have to agree to begin helping Africa to industrialize, to transform raw products in Africa, to pull people back into the urban centers and to begin creating an educated middleclass, even among the blue collar workers. Rural Africa cannot maintain its wildlife habitat, its biodiversity and its “wildness” unless the West helps it move in the same direction that it has evolved. Thus, conservation on its own fails and CBNRM as one aspect of conservation falls flat on its face. It must be part of a bigger plan for each country and fit into a bigger picture for the continent, linking into urbanization and industrialization, training in intensive natural resources management and empowerment of rural communities to sustainably manage their own resources along with concurrent benefits.

9.7.9 Donor and NGO Dependency Counter Productive to CBNRM

“There is growing evidence supported by this study that shows how some of the larger regional programs (such as the USAID - NRMP) may achieve results at a policy and national institutional level but tend not to be as successful at district and sub-district level. The larger programs with their rigid structures, annual work plans, semi-annual reports and log frames are not adaptable to community institutions and time scales” (IUCN/SASUSG, 1997).

In a number of cases, CBNRM projects have become too top heavy and donor dependent and tend to collapse when the donors pull out (Katerere & Chikoku, 2002 *In:* WSP, 2002). CAMPFIRE and ADMADE have suffered from donor dependency. Jones and Murphree (2004 *In:* Child, B., 2004a) state that very often, national associations, usually donor funded as in Namibia, Zimbabwe and Botswana, become another layer of bureaucracy on the CBNRM scene. They do

not necessarily represent the needed constituencies (e.g., producer communities) but are very good at absorbing much of the donor funding.

Where power lies with external agents such as governments, donors or NGOs, rural communities tend to be weak and unable to function on their own, taking away from the sustainability of such. To be effective, the role of NGOs, researchers and governments towards rural communities should be facilitative,

“invited rather than imposed, directed rather than directive and facilitative rather than manipulative” (Jones & Murphree, 2004 *In: Child, B.*, 2004a).

The conditions for donor driven community conservation are likely to be strong where donor experts and domestic constituents are strongly attached to them. Community conservation has been formulated and disseminated at numerous international meetings, applied widely and rapidly in Africa by NGOs and international aid donors such as USAID, often developed and implemented by particular “champions”, and reported on positively in television programs beamed around the world. In particular, Sub-Saharan Africa’s dependence on foreign aid and the expatriate consultants and experts this supports has made it the world region in which exogenous ideas about “what to do” hold the greatest influence. Conditions for the rapid transfer and acceptance of community conservation at the policy level in most Sub-Saharan African countries have been strong over the last decade (Adams & Hulme, 1998) (Table 9.18).

Table 9.18: Conditions in Sub-Saharan Africa supporting the development of CBNRM

Factor (a)	Summary of the Situation in Africa
1. Donor experts & domestic constituencies are attached to the narrative	1. Key donor countries (USA & UK) adopted a community conservation approach & this influenced their “experts” overseas. Conferences (Arlie 1993, Sunningdale 1996, Istanbul 1997) financed by official donors & NGOs helped to transmit the idea of community conservation. Large numbers of leisure-time conservationists in such countries learned to support the new narrative
2. When there is political, strategic or moral pressures on donors to act quickly.	2. Media accounts of the imminent extinction of the gorilla, African elephant & rhino prompted donors to act rapidly. Where states emerged from civil wars (Ethiopia, Uganda, Mozambique, Angola) there was an urgent need to save ‘the remnants’ of the conservation estate. Crises narratives (Roe 1995) allow foreign ‘techno-managerial elite’s to shape policy & action on the African environment.
3. When there has been little technical or socio-economic research locally	3. Despite the wealth of data on the zoology of charismatic species in Africa research on the ecology of Africa & on human-wildlife interaction remains in its infancy
4. When a recipient country relies heavily on expatriate experts for advice.	4. Many Africa countries were more reliant on foreign advisors in the early 1990s than they were at independence (Berg, 1993). This relates to specific advice on conservation & broader advice about the policy & institutional frameworks that countries should adopt.
5. When a recipient country relies heavily on foreign assistance	Sub-Saharan Africa is the most aid dependent region in the World. In 1990 foreign assistance, as a percent of GNP stood at 66% in Mozambique, 48% in Tanzania, 26% in Malawi, 18% in Uganda, 19% in Mali, 11% in Kenya, 14% in Zambia (World Bank, 1992, pp 256-7). The setting up of Global Environmental Fund (GEF) & specialist funds (e.g. USAID) post Rio has led to a flush of external funding for conservation projects in Africa. The idea of “Sustainable development” has also meant that international conservation NGOs have gained influence (and control) over some development funds.
6. When the recipient government is weak or authoritarian (or both)	Over the period 1960-1995 there have been frequent coups in African states. Where this has not occurred, then commonly, authoritarian regimes have held power (e.g., Kenya, Zaire, Malawi). Such regimes have been weak in terms of their ability to meet the needs of their people.
a. From Hoben (1995) b. Fascinatingly the country in Africa which has developed an indigenous model of community conservation, Zimbabwe, had an aid dependence (against GNP) of only 5 % in 1990 (World Bank, 1992, pp. 256-257).	
Note: Arlie, Berg, Sunningdale, Istanbul & World Bank not provided in References of Adams & Hulme (1998)	
Source: Adams & Hulme (1998) with permission, Institute for Development Policy and Management (IDPM), University of Manchester.	

Donors and their allied NGOs, which feed off the donor money, have tended to praise the success of CBNRM. This has been described as “project bias”, whereby successive evaluations of a region or program look repeatedly at the same projects and one another’s reports without properly questioning the nature of change on the ground. This leads to the narrowing of possible lessons that policy-makers and researchers can learn and constrains creativity and innovation (Adams & Hulme, 1998).

It might better be described as “not biting the hand that feeds you”, NGOs and consultants being notorious for telling the donor exactly what they want to hear in a bureaucratic environment where success is based on how much money one moves and not the actual outcome of a project. A positive evaluation that promotes a bureaucrat’s career can result in renewed or new contracts for the consultant, consulting firm or NGO undertaking the evaluation. A negative evaluation can result in the door being shut for future work with the donor.

Another major problem with donor driven CBNRM is that donor funding runs in three to five year cycles. Development in general has been hamstrung by such cycles, very often bringing to a screeching halt processes, which need a much longer duration to become “institutionalized” or to take root.

“Not uncommonly project designers are compromised by donor pressures for results and at the planning stage set objectives for 3 or 5 year projects that they know will take 10 or 20 years to achieve” (Adams & Hulme, 1998).

This, combined with a lack of adequate land and resource tenure, forces communities into short-term planning horizons for the use of wildlife and other resources that are part of long-term ecological processes (Jones & Murphree, 2004 *In: Child, B., 2004a*). Thus, the myth of CBNRM, as is the myth of “Wild Africa”, is perpetuated over and over again. Adams and Hulme (1998) go on to

say that the positive impacts of integrated conservation and development projects (ICDPs), another way of packaging CBNRM or community conservation,

“on local economies are typically transient and dependent on the maintenance of foreign aid flows”

(see Chapter 11), especially when much of the aid goes into supporting top-heavy umbrella associations as described above.

Murombedzi (2003 *In: Adams & Mulligan, 2003*) believes that CBNRM, as practiced today in Southern Africa’s former settler colonies (Namibia, South Africa, Zimbabwe, Zambia and Mozambique), is a convenient intervention that allows the state to extend its control over certain economically and financially valuable resources (wildlife), while appearing to empower “local communities” regarding control of “their resources”. It can even be argued that the governments and private sector tour and safari operators use CBNRM as a political ploy to maintain their economic dominance in Africa’s natural areas at the expense of rural communities, who gain a pittance of the actual value from these natural systems (see Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders). The principal author, once had a high level personality in CBNRM tell him, “leave the safari hunting for white Africans. It’s one of the few economic sectors they control, where a person with minimum education can find a career”. This is a form of “economic Apartheid”, where a few elites benefit to the disadvantage of the majority. Meanwhile, the West, which looks at CBNRM at a superficial ideological level, jumps on the bandwagon in full support and the myth goes on while rural Africans become poorer, habitat degrades and wildlife populations dwindle.

Thus, the local community also foregoes the majority of benefits derived from this exclusion, mostly in the form of revenue, since after governments and the

private sector take their shares, little is left for people at the local level. At the level of households, these benefits tend to be insignificant (LWAG/DFID, 2002; Murombedzi, 2003 *In: Adams & Mulligan 2003*), in many cases households losing more than they gain by giving up access to the conservation area and its resources (see Section 9.7.6, Getting the Economics Right).

Likewise, NGOs (both local and international), who make a good living off the donor handouts, which often drive these programs, tend to reflect and then impose Western attitudes and value systems of conservation on these rural constituencies. To a greater or lesser degree, these same critiques apply across most of the continent from Botswana to Tanzania to Cameroon. A key point that Murombedzi (2003 *In: Adams & Mulligan*) makes is that

“communities do not have the right to use wildlife, only the right to benefit from the use of wildlife by others”

with no attempt at identifying ways by which communities manage communal resources (e.g., grazing, wildlife, fisheries, etc.). As a result, Murombedzi found that most local people still see wildlife as belonging to national government and/or local government, depending on the program.

Murombedzi (2003 *In: Adams & Mulligan, 2003*) goes on to say that CBNRM disguises the real dilemma faced by the state, the contradictions of the dualistic nature of colonial property rights; large areas of privately owned white property on the best agricultural lands with large compressed black populations on per capita small over-crowded marginal agricultural lands, often in low rainfall areas.

This is compounded from pressures by IUCN to place 10% of each country's territory in parks and protected areas (see Chapter 11, Section 11.10.6 Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers), exclusion zones resulting in further compression and marginalization of rural Africans as currently practiced. Thus,

CBNRM provides property rights to rural communities assigned to them by colonial history, without questioning the legitimacy of or redressing the historical past, strengthening and reinforcing racial and class patterns of access to and use of natural resources. CBNRM tends to strengthen local government/traditional authority as redefined by colonial indirect rule (Murombedzi, 2003 *In: Adams & Mulligan, 2003*), that is chiefs and/or local governments often salaried by central government whose allegiances are to the bureaucracy and ruling party as opposed to their supposed constituency, the rural people living among wildlife (see Chapter 3, Section 3.1.4.1 Francophone colonial Africa, Indirect Rule).

CBNRM through foreign aided donor support thus places communities in a compromised “patronizing relationship” with governments, NGOs and mostly white safari and tourism operators, many of whom are remnants of the colonial past and to whom the community must forego its traditional rights of access to the area (Murombedzi, 2003 *In: Adams & Mulligan, 2003*) and their direct use of resources such as wildlife, honey, timber, fish, etc. This helps create the “myth of wild Africa”, free of people and their livestock, something very rare in Sub-Saharan Africa prior to the arrival of white people, where Africans had co-evolved with wildlife and were integral in maintaining the savanna landscape – as much a part of the savanna ecology as buffalo and elephant (see Chapter 1, Section 1.3, CO-EVOLUTION OF HUMANS AND WILDLIFE IN SUB-SAHARAN AFRICA). The historical reasons for the domination of the safari industry by whites originate in the appropriation of rights from local populations by the colonial state (Murombedzi, 2003 *In: Adams & Mulligan, 2003*) (see Chapter 3, Section 3.4, DEVELOPMENT OF AN ENVIRONMENTAL CONSCIENCE AND EXCLUSION OF AFRICANS FROM LEGALLY ACCESSING WILDLIFE). This appropriation of rights through the expropriation of natural resources and land still exists across the continent to this day. These expropriated areas and their wildlife then become the exclusive playgrounds of

wealthy, mostly European and American, clients. Protected areas are for everyone but the rural people living around and in some cases within them (e.g., game controlled areas in Tanzania, hunting blocks in Zambia, hunting blocks and national parks in general).

9.7.9.1 CAMPFIRE, Zimbabwe

Hasler (1999 *In: Roe & Jack, 2001*) argues that CAMPFIRE, rather than a true community empowerment program, has like ADMADE become highly politicized nationally and internationally. It suffers from political patronage, as is described in some detail in Chapter 11, which presents a hindrance to installing Western models of democracy in Africa.

“As a socio-political movement, there are a number of key loci of power and decision-making. At an international level, donor agencies, the United States Congress (influenced by the public and lobby groups), CITES and international wildlife lobby groups (see Chapter 10) all have an influence on CAMPFIRE. Nationally, policy and implementation decisions are central to the development of the program, since it is there that devolution decisions lie. The CAMPFIRE Collaborative Group²⁹⁰, designers and implementers of the program, act as an interface between communities and donors, policy makers and politicians, and they also command some power over outcomes, which may be in direct opposition to the government’s. Locally, Rural District Councils (RDCs) and District Administration also influence outcomes, and there are allegations of corruption and embezzlement of funds. Within communities, power is not diffuse, and often sits with leadership: elites, chiefs, democratically elected authorities such as the councilors or Village Development Committee members, or religious functionaries. Lines of patronage then, run from the local to the national level, with the ruling ZANU-PF government attempting to impose centralized control on remote villages and peoples” (Hasler, 1999 *In: Roe & Jack, 2001*).

²⁹⁰ CAMPFIRE Collaborative Group consists of CAMPFIRE Association representing rural district councils, Wildlife Department, Center For Applied Social Sciences (CASS) at University of Zimbabwe, WWF, African Resources Trust, Zimbabwe Trust.

Back in the late 1980s, as the Cold War began to wane, there was pressure from Jesse Helms and Pat Buchanan to shut down the U.S. Agency for International Development (USAID) as an instrument of the Cold War that had outlived its usefulness. USAID scrambled to show success stories from its interventions in developing world countries. There were few and/or none to be found, as development has never been the goal of Western donors (see Chapter 11 on foreign aid). They stumbled on to CAMPFIRE, saw that it was a success story, and quickly took ownership of it by throwing large sums of money into the program.

The intervention by USAID resulted in the CAMPFIRE Association of Rural District Councils (RDCs) (local government, not producer communities) becoming more dependent on U.S. foreign aid (American taxpayers' dollars) than money from wildlife. The CAMPFIRE Association seemed to spend more time playing international politics than meeting the direct needs of its constituency, the rural communities. The pro-sustainable use group CAMPFIRE Association has been a key player on the international stage at such forums as the Convention on International Trade in Endangered Species (CITES) and the Convention on Biological Diversity (CBD) by turning the international debate over sustainable use versus preservation into a community issue of empowerment and economic development for which the animal rights have little rebuttal other than to try and discredit such programs (Duffy, 2000). The CAMPFIRE Association does not really represent rural producer communities, nor does it really need them since it has lived off Western donor money, turning it into a top-heavy organization, like many NGOs feeding at the donor trough. Without USAID intervention, would the evolution to representation of producer communities have happened any quicker – today this is being talked about?

As USAID, after spending \$50 million over about 11 years (1989-2000) (Sparrow, *pers. comm.*), pulls out at the beginning of the 21st century, the CAMPFIRE Association will go through major withdrawal symptoms (e.g. streamlining its personnel) and may not survive, unless it can demonstrate to Rural District Councils (RDCs)/communities that it is providing them with a service and that they should spend some of their profits from wildlife to keep the CAMPFIRE Association going. Fabricius, *et al.* (2001) place the total amount of donor funding to CAMPFIRE at US\$ 44.1 million and also conclude that the program is over-bureaucratized at the district (RDCs – local government) and national (CAMPFIRE Association) levels, resulting in a failure to devolve meaningful rights of ownership to the ward and village levels. Barrow, *et al.* (2000) note in East Africa that heavy donor dependency and funding

“has resulted in high costs and high infrastructure dependent community conservation structures and programs. This perhaps was inevitable, given the nature of donor funded projects, but it means that conservation authorities must adapt these structures to the more modest financial resources available internally”.

Already CAMPFIRE appears to be in trouble, as its constituency, “Rural District Councils (RDCs)”, is refusing to provide CAMPFIRE with support funds since the association provides them no services (Sparrow, *pers. comm.*). Unfortunately, many of the services, which CAMPFIRE should be providing to its constituency, are being provided by other NGOs such as WWF (wildlife monitoring and quota setting) and ZIMTRUST (institutional development); both of whom had an important role to play initially, but who should slowly hand over much of these responsibilities to the CAMPFIRE Association. Unfortunately, by making themselves indispensable, they have lived off of USAID/donor funding and are reluctant to devolve these responsibilities to the CAMPFIRE Association, these roles being their *raisons d'être* while they feed at the donor trough. The CAMPFIRE Association planned further devolution to the village level until the

political turmoil of the early 2000s set this process backwards, likely for many years.

9.7.9.2 LIFE, Namibia, Nyae Nyae Conservancy

Habits born out of a legacy of marginalization have fostered a culture of dependency, which has resulted in expectations for outsiders to take the lead, which can contribute to passivity and reluctance to be proactive (Berger, 2003). Too often, donors, both at the local and national levels, have created dependency. This must be avoided at all costs.

9.8 THE WAY FORWARD – CONSERVATION BY THE PEOPLE – STAGE 4 EQUALS DEVOLUTION

The International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU) World Commission on Protected Areas (WCPA) and the WWF have recognized that (Beltran, 2000):

- “Protected areas will survive only if they are seen to be of value, in the widest sense, to the nation as a whole and to local people in particular.
- The rights of indigenous and other traditional peoples inhabiting protected areas must be respected by promoting and allowing full participation in co-management of resources and in a way that would not affect or undermine the objectives for the protected area as set out in its management plan.
- Knowledge, innovations and practices of indigenous and other traditional peoples have much to contribute to the management of protected areas.
- Governments and protected area managers should incorporate customary and indigenous tenure and resource use and control systems, as a means of enhancing biodiversity conservation”.

These objectives are laudable given the history of conservation in Sub-Saharan Africa. However, a key question must be asked, “Who developed the management plan”? Was it developed by expatriates and government bureaucrats and/or undertaken in collaboration with rural peripheral communities or communities living within these protected areas? What are the biases in developing the plan for utilization of the protected area? There is still a tendency to move people out of protected areas and to ignore their traditional resource uses and management systems to create exclusion zones. Too often, while “community participation” is spoken of, the rural communities, while they may have a say, take a back seat to other stakeholders and more “Sherwood Forests” are created instead of integrating the rural communities into the management of the protected area and more importantly management of its resources (see Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource).

Jones and Murphree (2004 *In:* Child, B., 2004a) conclude that policy and legislative changes

“do not go far enough in removing bureaucratic hurdles that increase transaction costs; they have not gone far enough in giving full management authority to resource users; they have not gone far enough in treating wildlife as a competitive form of land use; and they have not gone far enough in providing local residents with secure and exclusive rights over their land” and resources.

In simple terms, devolution of authority over wildlife and land to local communities to own, manage and benefit from it is far from having been achieved. The following case studies are trying to move in this direction – the ultimate step in empowerment and the only hope for Sub-Saharan Africa’s natural systems to survive the long-term.

9.8.1 Why Conservation by the People Makes Sense

In most of Africa, the state has limited resources to manage “national common property” as a means of conserving vulnerable species, critical and/or unique habitat. Giving the prevailing economic conditions in Africa, this implies that the park estate must necessarily be very small, concentrating state managerial resources (Murphree, 2001 *In: Baldus, et al.*, 2001).

Speaking of natural forest management, although this equally applies to wildlife, fisheries, pasture and other natural resources, Messer (2001) states,

“However, increasingly, it is being recognized that many indigenous forest management systems have been, and, fortunately, often still are, quite ingenious at contributing to preserve the natural environment whilst at the same time making a living out of that same resource base. What is at stake here is not so much the content but the process of policy formulation, the nature of political participation and the legitimate desire of forest users to manage the resources from which they derive part or all of their livelihoods. Needless to say, monitoring this type of ‘qualitative’ issue is not easy, and from the moment a decision is taken on devolving power to anybody, checks and balances should be envisaged to restrict their authority if necessary and to allow for complaints on the part of the local populations to be voiced and addressed”.

In other words, the role of government changes from one of conflict as a policeman to collaboration, setting the rules, monitoring to assure they are agreed on, making sure the community abides by any agreements and extension.

9.8.2 Guidelines for Success

The 1999 African Advisory Board²⁹¹ (AAB) developed “Community Guidelines”, which set the roles that each stakeholder has in CBNRM. Each country was asked to consider adapting the “Community Guidelines” to its own socio-economic and political realities. Based primarily on the Southern African experience, the AAB came to the conclusions that CBNRM must fulfill the following requirements in order to have “Conservation by the People:”

Similar to the above, Fabricius, *et al.* (2001, *In:* Fabricius, *et al.*, 2004) found that where resources have high unit value, such as mega-fauna, once the beneficiaries are relatively small (less than 100 households) or at densities less than 20 people/km² (IUCN/SASUSG, 1997; Murphree, 1997), the income/household from community-based wildlife management can be relatively high (see Section 9.7.6.4, CBNRM will not create a “middle class” in rural Africa, CAMPFIRE, Zimbabwe). This could also be argued for tropical lowland forests, if the rural community was allowed to obtain the majority of the benefits or even in certain coastal zones, if community-run SCUBA diving and sportfishing was developed. Unfortunately, as described, until now, the majority of the true value of these resources is taken up by outsiders. This must change.

The AAB (1999) determined that the role of government should be: 1) to insure that wildlife and biodiversity are available for future generations, 2) to insure that an appropriate wildlife policy exists, 3) to insure that appropriate monitoring and enforcement are in place, 4) serve as a watchdog, 5) create an enabling environment for community empowerment, 6) create an enabling environment for

²⁹¹ The AAB was a loose confederation of governments, rural communities, sport hunters, professional hunters and safari operators, conservation NGOs, researchers and academic institutions which met once a year to network, discuss common issues associated with the rural hunting areas of Africa and to workshop common problems, sharing group experiences in an attempt to find the way forward. It began in 1995 and ceased to exist at the end of 2001.

community and private sector joint ventures and 7) provide technical support and community capacity building.

COMMUNITY GUIDELINES

- Grass roots approach;
- Devolution of rights to landholders;
- Insure responsibility devolved to lowest level in society that can be performed adequately – household/village level/WARD;
- Trust/conservancy should consist of 200-250 households maximum in order to allow regular communication;
- Close link between production (wildlife) and benefits in order for community to realize importance of protecting wildlife;
- Security of tenure to resource user (i.e., safari operator and community);
- All benefits of wildlife go to landowners and they determine how they spend or disperse benefits;
- Community decides how to use quota (e.g., sell to safari operator, split setting aside portion for traditional hunter, photo tourism only, and/or combination);
- Incentives to invest – long-term tenure for safari operators – “joint venture partner;”
- Incentives to conserve wildlife – benefits destined for communities – go directly from joint venture partner to community;
- Right of community to independently select joint venture partner;
- Accountability – community held to certain responsibilities for right to benefit;
- Transparency – in distribution of benefits – external audit;
- Wildlife benefits to government from income tax of community and safari operator (i.e., same as other commercial businesses); and
- Hunting quotas and other management decision-making based on scientific approach – appropriate management data collected by safari operator/community.

Source: AAB (1999)

According to Schlager and Ostrom (1992), five basic rights are most relevant for the use of common resources. These are defined as follows:

- Access—the right to enter a defined physical area and enjoy non-subtractive benefits (for example, hike, canoe or sit in the sun);
- Withdrawal—the right to obtain resource units or products of a resource system (for example, catch fish or divert water);
- Management—the right to regulate internal use patterns and transform the resource by making improvements;

- Exclusion—the right to determine who will have access rights and withdrawal rights and how those rights may be transferred; and
- Alienation—the right to sell or lease management and exclusion rights.

An examination of CBNRM programs in eight countries indicates that success depends on meeting most of the following criteria (Child, 1995):

- Producers, managers and beneficiaries should be the same people;
- Producer communities should be small enough for all households to participate in the program;
- Bodies representing the community should be accountable to the community;
- Functions should be developed to the lowest level of social organization at which they can be performed properly;
- There must be a close link between production and benefits;
- Producer communities must be able to allocate their earnings as they wish;
- All marketing should be open and competitive;
- Wild resources should not be taxed more heavily than other resources;
- Communities should not over extend themselves;
- Government is the ultimate authority for wild resources;
- Developing community management skills and systems is vital; and
- CBNRM represents cooperation between local people and government.

Murphree (1998b *In: Fabricius, et al., 2001*) outlined the following principles necessary for success:

- Effective management of natural resources is best achieved by giving it focused value for those who live with them;
- Local people are the real managers of the environment, and they should derive benefits from natural resources that exceed cost;
- Differential inputs must result in different benefits;
- The size of the benefit should be proportional to the input or cost of looking after wildlife;
- There must be a positive correlation between quality of management and magnitude of benefit;

- Good management of resources should be rewarded by matching benefit;
- The structures which preside over the sharing of benefits should be the same institutions which are responsible for management of the resources;
- The unit of proprietorship should be as small as practicable, within ecological and socio-political constraints; and
- Small institutions increase the efficiency and willingness to take responsibility and decrease the likelihood for corruption. They enhance a sense of ‘collective identify’ and make it more practicable to enforce rules.

Ostrom (1990 *In: Fabricius, et al.*, 2001) laid out the following principles for long lasting communal institutions:

- **Clearly Defined Boundaries:** Individuals or households who have rights to use resources must be clearly defined, as must the boundaries of the resource itself;
- **Rules Governing Use Or Provision Of The Resource Must Be Appropriate To Local Conditions:** Rules for using the resource or providing it to resource users, such as restricting time, place, technology and how much can be used, must be appropriate to the resource itself, including availability;
- **Collective-Choice Arrangements:** Most individuals affected by the operational rules can participate in changing the rules;
- **Monitoring:** Monitors of the rules and the use of the resource are either resource users themselves or accountable to other users;
- **Graduated Sanctions:** Resource users who break the rules are likely to face various degrees of punishment, depending on the seriousness and context of the offence. Punishments are decided by the other resource users, by officials accountable to them, or by both;
- **Conflict Resolution Mechanisms:** Resource users and their officials have rapid access to low-cost local mechanisms to resolve conflicts among users or between users and officials;
- **Recognition Of Legitimacy:** Government supports, or at least does not challenge, the rights of the resource users to devise their own institutions; and
- **Nested Enterprises** (for Common Property Resources that are part of a larger system): Resource use or provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested institutions, where rights and responsibilities are clearly defined.

The IUCN/SASUSG (1997) outline a series of incentives they believe need to be initiated by the state, though in essence they are also policies that need to be recognized by the international community for CBNRM to be successful:

- The recognition of wildlife management, not merely as an acceptable form of land use, but rather as a preferred form of land use;
- Co-ordination amongst government agencies responsible for resources to ensure that conflicting agendas are not prejudicing the development of wildlife as a land use;
- The removal of market distortions which favor lower valued land uses (e.g. subsidies to the cattle industry) (see, Chapter 11, Section, 11.7.7.1 Lomé Convention and subsidized beef in Botswana);
- The streamlining of bureaucracy in permit issuance and project approval which acts as a disincentive to the development of the wildlife industry;
- Collaboration and co-operation with NGOs and the private sector in community development based on natural resources;
- The promotion of wildlife populations outside the SPAs (protected areas) through the translocation of breeding nuclei of selected species from SPAs to new initiatives at economical rates;
- The expenditure of government funds on research which will benefit the wildlife industry;
- The defense of wildlife producer communities rights in international treaties such as CITES (see Chapter 10);
- Effective management of natural resources is best achieved by giving the resource a focused value. To determine whether the benefit of managing a resource exceeds the cost, the resource must have a measurable value to the community;
- Differential inputs must result in differential benefits: those communities living with the resource and thus bearing a higher cost should receive higher benefits than those who do not bear the cost;
- There must be a positive correlation between the quality of management and the magnitude of derived benefits: an incentive for good management must reward greater investment in the resource with greater benefits;
- The unit of proprietorship (i.e., who decides ?) should be the same as the unit of production, management and benefit: the group which manages the resource should also form the local management institution; and
- The unit of proprietorship should be as small as practicable: smaller social groups are better at managing themselves and the resource than large anonymous institutions.

These ingredients for success from various groups and individuals are all similar and they all imply devolution to the producer community, which would be a village or group of villages and the user groups within these bodies.

9.8.2.1 Wildlife attributes for success

Roe, *et al.* (2000) identify the following attributes of wildlife for CBNRM to be successful. This could also apply to other natural resources (Roe, *et al.*, 2000):

- **Clear and defensible boundaries:** Wildlife assets are clearly demarcated and agreed on by users. Mobility of wildlife as a “fugitive” resource on which many CBNRM schemes are based is often questioned. Thus, the size of the area must be large enough to house entire resources and/or quotas between areas that share resources must be jointly determined and shared. A proper monitoring program will help define and clarify this issue (see Section, 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability);
- **Manageable scale:** “Wildlife areas need to be sufficiently large to warrant collective action, yet small enough, given the communication and transportation technology in use, that users can develop accurate knowledge of external boundaries and internal microenvironments;”
- **Relative scarcity:** There is little advantage in organizing in situations where wildlife assets are under-utilized and abundant, while the reverse trends, as over much of Sub-Saharan Africa in the 21st century, encourage organization;
- **Substantial value:** The greater the value of wildlife, the greater the chances of success. The danger is that with this high value, more powerful groups move in at the expense of communities;
- **Relative proximity to communities:** Wildlife needs to be close to the respective beneficiary community, but not so close that the costs outweigh the benefits, such as wildlife becoming problematic on a large scale (e.g., regular elephant raiding of fields or cattle killing by lions), “nor too far” which may lead to there being little interest in investing labor in its management;

- **Predictability and ease of monitoring:** “Reliable information” about the general condition of the wildlife assets must also be accessible at reasonable cost (see Section, 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability);
- **Seasonality in tune with livelihoods:** Wildlife utilization must dovetail with other livelihood strategies. Traditionally, many hunting seasons coincided with the end of the harvest/agricultural season, but many months into the calving season so that the next year’s crop of wildlife was assured of survival (see Chapter 2, Section 2.1.3, Controlling Access to Wildlife Through the Chief; Section 2.1.5, Mobility as a Means of Managing Natural Resources; Section 2.1.6, Hunting Guilds as a Means of Controlling Access to Wildlife; Section 2.2.2.4, Fishing seasons; Section 2.3.1, Land and Section 2.3.2, Pasture and Water); and
- **Ease of utilization:** Wildlife assets are more easily managed where the mechanics of protection and harvest are simple and affordable.

9.8.2.2 Community attributes for success

Roe, *et al.* (2000) identify the following attributes of communities and community institutions for success:

- **Ability to claim and secure tenure:** Security of land and resource tenure is one of the most critical requirements for success, especially from centralized governments to local communities, so that the latter may take advantage of the resources, while excluding outsiders (see Section 9.7.2.1, Devolution Through Policy Reform, Land and Resource Tenure);
- **Small-scale:** (referring to social not spatial scale): Effective community organization based on personal interaction necessary for group “cohesion” is only possible within relatively small groups;
- **Demand for, and dependence on, wildlife assets:** The greater the demand for wildlife and the more vital people’s livelihoods, the greater the chances of success.
- **Cultural significance of wildlife:** It is important to build on the ties (see Chapter 2) between local people and wildlife that still remain despite the attempts by colonialism and the last 40 years of independence to extinguish them. Stronger ties create a greater likelihood for success;

- **Stakeholder identification and group demarcation:** This refers to the ability to clearly identify and determine stakeholder groups [e.g., traditional groups (hunters, charcoal makers, sawyers, fishermen, honey collectors, traditional herbalists, pastoralists, etc.), government (game/parks departments) and private sector (safari and tour operators)] and negotiate their rights of access – when, where, how, what and how much, so as to minimize conflict;
- **Institutions built on existing tradition:** “Community institutions: social structures, rules, processes and arrangements, are the building blocks of community organization and collective action and so have a major influence on the efficacy of CWM (CBNRM)...Whether CWM (CBNRM) is best ‘housed’ in these old institutions or in new purpose-built institutions is another question. Traditional institutions often play an important role in managing wildlife, and their exclusion from some West and Central African CWM initiatives has undermined these initiatives. Many effective local institutions are highly informal, consisting of regularized practices of particular groups of people rather than a fixed set of rules; they are dynamic and flexible, which may be in contrast to introduced formal organizations. On the other hand traditional institutions are sometimes male-biased and relatively undemocratic, whilst novel institutions may offer groups previously marginalized from decision-making, including women and migrant people, the opportunity to have a say...Experience seems to show that the solution lies with new learning institutions built on solid old foundations”. (see Section 9.7.4, Ignoring Constraints in Institution Building and Section 9.7.4.2, Ignoring Cultural Constraints in Institution Building);
- **Representativeness and legitimacy:** “The distribution of decision-making rights over the wildlife assets needs to be seen as reasonably fair. Making institutions genuinely representative has proven tricky...Legitimacy in the eyes of the community may not stem from the accountability and transparency so much favored by some outsiders. Relatively unaccountable local leaders and procedures may have a firm base of support in some cases”. However, given the history of CBNRM and its failure with regards to financial management, an auditing system by outsiders is highly recommended (see Section 9.7.6.3, Accountability, transparency and the creation of capitalist structures within communal systems);

- **Adaptability and resilience:** The ability of institutions to deal with common problems and adjust local rules of wildlife use in response to changing circumstances is crucial to longevity of initiatives. This is especially true where because of increased human populations relative to the resource base, traditional extensive management systems (see Chapter 2) may need to be integrated into more intensive management systems based on monitoring and limited quotas (see Section 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability);
- **Effective rules, mutual obligations and sanctions:** “CWM (CBNRM) institutions need rules for their members to abide by. These appear to fall into two groups: 1. Use Rules: restricting time, place, technology or quantity of wildlife units, 2. Provision Rules: requiring labor, materials, and/or money. Such rules need to be appropriate and flexible enough for local conditions”. Rule systems depend on violators being sanctioned appropriate to the seriousness of the offence, either by their peers or by officials accountable to the group;
- **Balance between customary and statutory law:** “...statutory law cannot be overlooked. However, people in rural areas tend to be more familiar with customary rules, regulations and boundaries than with statutory law...Compared to statutory law, customary law is often speedy, binding, known to all, cheap and with flexible sanctions determined by the violator's ability to pay. However, community rules can also be quite severe and can be abused...When fundamental human rights are being violated, or when serious ecological destruction is threatened by community action then statutory law may sometimes be the only option;”
- **Negotiated goals:** CBNRM needs to be “negotiated” among stakeholder groups;
- **Conflict-resolution capability:** Conflict- or dispute-resolution mechanisms are essential both between stakeholders (e.g., government, community and private sector) and within stakeholder groups, especially the community institution linking traditional to modern values and management systems as described above, should serve this function for the community;
- **Equity in distribution of benefits and social justice:** CBNRM requires that community institutions have a system for the equitable distribution of benefits and that this be democratically determined, transparent and accountable;
- **Ability to negotiate with neighbors:** Communities should be able to negotiate with neighboring communities to resolve conflict over access to and use of resources, boundaries, etc.;

- **Political efficacy and space to build community-government relationships:** “Communities (often) lack the resources to tackle ecological issues at a regional scale, and in many places have lost their traditional ethos and institutions. Government agencies dealing with conservation lack the necessary micro-knowledge, on the spot human-power, or even the necessary mandate when other agencies over-rule them. Many state roles remain critical, such as resolution of disputes, which cannot be tackled at the local level; legal and administrative back-up of community efforts; channeling assistance from supporters; and acting as a buffer against exploitative outsiders...Stable community-government relationships are more likely where village institutional structures are strong. This is especially the case if these structures are well-established and the government institutions have come to terms with being confronted with a powerful local institution;”
- **Capacity for layered alliances:** To avoid exacerbating community divisions, “layered alliances” (Agarwal, 1997 *In: Roe, et al., 2000*) may be needed, such as central government retaining overall responsibility for the sustainable use of wildlife resources, monitoring, enforcement and internal activities of the conservancies (Jones, 1999b *In: Roe, et al., 2000*) though the long-term goal has to be to train individuals at the tertiary level and plant them back into these conservancies so that full devolution may take place. Within communal conservancies, certain resources may need to be managed by a group of conservancies over a larger space than an individual conservancy, while certain management activities will need to take place at lower levels than the conservancy, such as at the village, user group or even household level. The system must be flexible enough to allow these nested layers of decision-making, authority and resource use to develop over time (Jones, 1999b *In: Roe, et al., 2000*); and
- **Confidence to coordinate external institutions:** With time and individuals from the community receiving appropriate training and then experience representing the community, they will be capable of standing up to and negotiating with both the government and private sector to assure that both their rights of access are assured and that they can negotiate for a rightful share of benefits accrued from the sustainable exploitation and marketing of their resources.

9.8.2.3 Human capital, skills and knowledge

Roe, *et al.* (2000) identified the following as critical to the success of CBNRM:

- **Balance of 'scientific' and indigenous knowledge:** “Traditional ecological knowledge (TEK) and practices often comprise a complex and dynamic mix of old and new, theoretical and practical. Such knowledge incorporates information, attitudes, values and skills and derives its legitimacy and strength from being embedded in the cultural and political milieu of the community. However, for many years TEK has been largely ignored by conservation managers in favor of modern 'scientific' knowledge. Recently, however, TEK has been increasingly recognized as a valid component of resource management...CWM initiatives that build on a combination of TEK and 'scientific' knowledge can result in increased acceptance by both communities and conservationists and mutual understanding;”
- **Versatile leadership:** “Even where efforts are widely shared within a community, one or more charismatic, multi-faceted leaders usually play key roles as catalyst, conflict resolver, or link between community and outside world;” and
- **Numeracy and literacy:** Numeracy and literacy are important skills if communities are to enter meaningful negotiations with the private sector and other external agencies; for example, when agreeing hunting concessions, drawing up contracts for joint venture enterprises or supplying wildlife resources to a particular market.

As noted in Section 9.7.5, Lack of Technical and Management Skills, the authors do not believe that CBNRM goes far enough, if in reality there are aspirations that one day communities will stand on their own two feet. Workshops and short courses are not enough. Selected youth, the “bright lights” from the community, need to be identified and sent off for university training in a variety of skills, from wildlife and range management to business, marketing, accounting, while others need to be apprenticed as professional hunters and tour guides. Initially, until tertiary educational institutions improve in the rest of Africa, South Africa will serve as a key center for tertiary training. Exposure to South Africa/Southern Africa will provide an enlightening experience to youth from many rural areas of

just what the potential and value is of wildlife and other natural resources. With these skills, community-owned safari and tourism businesses will evolve, as described in Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders.

Unless the wildlife populations and natural beauty are exceptional, the chances are that the core business will be safari hunting that will serve as an “embryo of conservation”, allowing wildlife populations to build up, where other ventures such as eco-tourism may become viable. However, as discussed, the protected area must operate as a large corporation with many companies, providing income generating opportunities at the household level sustainably exploiting the myriad of resources traditionally taken from these natural systems: wildlife for trophies, wildlife for meat, fish, lumber, charcoal, thatch grass, honey, other wild foods and medicines, pasture, etc. (see Section, 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa). The management plan of the area will be developed by this educated group “planted” back into the community, which will take Western concepts of intensive management and monitoring and integrate this into traditional management systems and controls as discussed in Chapter 2.

Even with tertiary education, youth will only have the basic skills to begin learning. Running safari companies, marketing, dealing with clients and different cultures, etc. are skills learned in the field. Initially, teaming up these graduates with a “mentor” safari/tourism operator will be critical. As discussed above, ideally, it should be someone semi-retired or retired who can be hired on a salaried basis by the community over a five to 15 year or longer period who will “teach them how to fish” until they feel they have enough experience in putting in roads, in camp building, in judging trophies, in marketing overseas shows and in understanding the kinds of foods and hunting experiences desired by different

nationalities. One of the biggest shortcomings of rural communities, with regards to valorizing wildlife, is poor links to the marketplace must be overcome!

Without a combination of both tertiary and practical skills development, there will be no independence of rural communities from exploitative middlemen and CBNRM will be doomed to failure. Furthermore, as discussed, many of the skills training needed by rural Africans has nothing to do with CBNRM and resource management and marketing, but with taking the majority of the youth out of the rural areas into an urbanized global economy to relieve pressure on the overly stressed rural systems and their resources.

9.8.2.4 Physical capital

A major constraint for most communities and the returning students will be money to jump-start a company, purchasing a vehicle and basic equipment to supply a hunting/tourism camp. Nice camps can be built with local materials, but such items as beds, a refrigerator, freezer and cooking equipment must be purchased. There will also be costs in having someone with access to the Internet to be in regular contact with clients and prospective clients. Plans must exist to help these communities obtain low interest loans to start these businesses. This may not be easy as they usually have little or collateral (e.g., land, home, etc.) that can be used to secure a bank loan. Once again, tenure becomes a major issue. This is one area where donors and/or NGOs might play a role in helping to jump-start these enterprises, though there should be no handouts. Possibly a better option and beginning to happen with rural communities bordering the Kruger National Park (Brits, *pers. comm.*) is one where joint ventures are being undertaken with the private sector with 15 year leases that includes putting in the infrastructure such as lodges and fencing. The private sector provides various

levels of training at all skill levels with the idea that in 15 years the lodge/business is turned over to the community.

Since 2003, the World Bank has created the Grants Facility for Indigenous Peoples” available for nationally registered NGOs within a given country It supports:

- Innovative pilot projects that build on indigenous culture, identity, knowledge, natural resources, intellectual property and human rights, and/or institutions;
- Planning and preparation of development projects implemented by indigenous peoples, communities and organizations;
- Recommendations made by the UN Permanent Forum on Indigenous Issues on social and economic development areas; and
- Development of partnerships and alliances with other stakeholders, such as governments and international organizations, or between indigenous peoples and organizations.

Grants are given for US\$ 10-30,000, with the NGO having to demonstrate that it has 20% of the grant in cash or in kind and has a legally established bank account in its name. Detailed information on this program and applications should be sent to indigenouspeoples@worldbank.org. It should be clearly understood that even the amount of money required to apply for such a grant, while small by Western standards are large by Sub-Saharan African standards.

9.8.3 Devolution on Private Game Ranches, Southern Africa, Short-Term Success, Long-Term Failure?

CBNRM is not about private ownership, but the way in which governments empowered the private sector now needs to be undertaken at a community level.

However, as a precursor to CBNRM that demonstrates the importance of devolution as the basic tenet to successful wildlife management, one of the most successful examples of conservation has been on private game ranches and conservancies in South Africa, Namibia, Botswana and until recently in Zimbabwe, where wildlife is displacing livestock at a rapid pace. The landowner – in this case private individuals, as opposed to communities – has exclusive rights to determine how wildlife will be used, who he selects as partners and ultimately has exclusive rights to benefit from wildlife.

Major differences between CBNRM and commercial game ranches in Southern Africa are (ZAWA, 1999):

- Managed under single ownership, generally needing to support only one family and not 100s or 1,000s of families. In many cases (e.g., South Africa) they serve as weekend places, secondary incomes or even tax write-offs for wealthy professionals or businessmen living in the city);
- Outsiders (e.g., local communities) excluded so that conflicting land uses (e.g., agriculture, livestock, fishing, charcoal making, poaching, etc.) are virtually eliminated unless desired by the individual landowner;
- Game, a fugitive resource, tends to be fenced-in, especially in South Africa, but not so much in Namibia or Zimbabwe, and is thus more easily accounted for by the owner;
- Minimal government interference;
- Long-term tenure assured with vested incentive to reinvest profits back into ranch and into building up trophy quality of wildlife;
- Rancher owns wildlife as opposed to government in most communal areas with trophy fees and daily rates going to landowner who pays income taxes instead of directly to government;

- Game ranches on smaller areas ranging from 500-12,000 ha on average allowing for intensive management of species and habitat as opposed to vast extensive areas of safari hunting blocks in communal areas that can be 1,000s of km²; and
- No limits on how wildlife is marketed (e.g., in many communal areas certain species, such as leopard, lion and elephant, can only be taken on 14 or 21 day hunts depending on country, and more flexible seasons).

Countries with strong economies and commercialized wildlife sectors, such as South Africa and Namibia, show the highest proportion of increasing species populations (Cumming, 2004 *In: Child, B.*, 2004a). In South Africa, there is more wildlife today than at the turn of the century, the majority being on private land. In South Africa in 1999, there were an estimated 17 million ha consisting of 9,000 privately owned game ranches employing 63,000 people, while there were an estimated 7 million ha consisting of 19 national parks and 421 provincial parks/reserves. There was 2.5 times more game on private ranches versus public lands (African Advisory Board, 2000a); while in the rest of Africa wildlife and wildlife habitat are on the decline. By 2004, it is estimated that there were 9,000 privately owned ranches covering 17 million ha of land employing 70,000 people, including professional hunters (PHASA, 2004).

“In Zimbabwe, there were approximately 2.7 million ha of land under commercial wildlife production (nearly 7% of the country), an increase from about 35,000 ha in 1960. Of 4,000 commercial farmers, 1,200 were actively engaged in wildlife production, and several large conservancies (Save Valley, 326,000 ha, Chiredzi River, 80,000 ha and Bubianna, 127,000 ha) were beginning to appear as mechanisms for scaling up wildlife management. The amount of wildlife quadrupled in a 15-year period” (*Child, 2005 In: Lyman & Child, 2005*).

In Namibia, about 18–24% of commercial land is used for wildlife production properties, with over 400 registered commercial hunting properties. Between

1972 and 1992, wildlife on commercial land increased from 700,000 to nearly 1.2 million animals and is continuing to rise. There are 24 conservancies, double the number since 1988, covering close to 4 million ha (Child, 2005 *In: Lyman & Child, 2005*).

This shows us just how far CBNRM has to go.

As impressive as this may seem, the majority of these private farms and conservancies are in the hands of a white minority, wildlife being inaccessible to the majority of Southern Africans. In South Africa, many of these game ranches are weekend getaways for urban-based professionals for both personal and corporate entertainment, only a small percentage of them having to economically support the owner full time. In many cases, they serve as a tax write-off, though South African law is making this more difficult.

The question that continues to arise is the following,

“Is the current distribution of wildlife and associated land, both public and private, sustainable, when it is available to only a small fraction of South Africa’s/Southern Africa’s population”?

Many would argue that unless the economic and land tenure dynamics of Namibia and South Africa change, more “Zimbabwes” could be around the corner (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife). In both countries, game rancher/farmer associations, professional hunter associations and some professional hunting schools are developing black economic empowerment (BEE) schemes to make the wildlife industries more inclusive of the formerly disadvantaged. Proactive action oriented programs are needed now!

An additional threat to South Africa’s wildlife industries is an attempt to over-regulate from central government. The National Environmental Biodiversity Act of 2004 (RSA, 2004) and associated draft norms and standards of the hunting

industry (DEAT, 2006a) was developed by a “panel of experts” that did not involve the game ranchers nor the provincial nature conservation agencies (the line managers), game capture/translocation, sport or traditional hunters. Other than representation by the Professional Hunters Association of South Africa (PHASA), the panel members were mostly urbanites consisting of scientists, bureaucrats, union leaders and others whose lives are not directly tied to living from the resource, the draft hunting norms and standards reflecting this urban bias. The panel’s recommendations leading to the development of norms and standards for hunting could detract from the economic viability of the industry [e.g., with minor exceptions - no trophy hunting on national or provincial protected areas; no Problem Animal Control (PAC) by overseas trophy hunters; breeding for color variations may be out such as golden wildebeest, white and black springbok; making it difficult for ranchers to keep wildlife that is not found within its natural range limiting the diversity of product provided to client hunters; closure of hunting for captive bred lions and general restrictions on captive breeding] (DEAT, 2005a; 2005b; SA Wingshooters, 2005; DEAT, 2006b; Hoogkamer, *pers. comm.*). These policies must be discussed and implemented in collaboration with the game ranching and hunting industry.

The game ranching and hunting industry is concerned that there is a desire to impose biodiversity as a priority on their ranches, where they see ranching as first farming with biodiversity as a secondary spin-off. At worst, there is fear that lurking behind the scenes is the urban-based animal rights movement that wishes to see hunting closed. They argue, why can exotic species of livestock be placed on the land, but not wildlife, as long as the wildlife does not suffer? Certainly, few people in the game ranching industry would condone mixing of gene pools such as western roan with southern roan, the Lord Derby eland with the Cape eland, or the blue wildebeest with the black wildebeest, which produce reproductively viable offspring. This needs strict regulation. Why is unidirectional breeding, or “upgrading” by the livestock industry considered appropriate (Hammack, 2003),

but the same process to develop color variants of wildlife inappropriate? Where does “canned hunting end”. What about “put and take” kudu, rhino and the many other game bought and sold at game auctions even by provincial nature conservation officials. Should this be stopped? Care must be taken that this lucrative industry is not forced out of wildlife and back into cattle ranching that could result in a loss of biodiversity across the country (maintenance of natural habitat with regards to soils, vegetation, insects, small mammals, reptiles, amphibians, etc.).

In essence, this is what we are seeing all over Sub-Saharan Africa, where rural people are opting out of natural systems for man-made systems because of centralization of control, expropriation of benefits, tenure issues and over-regulation.

In addition, as implemented, the firearms act (SAP, 2000) is also discouraging overseas hunters as well as prospective local hunters, who are more important than the overseas hunters (see Chapter 5, Section 5.12.7, Attaining Food Security through More Appropriate Land Use Options, Wildlife as a Land Use Option on Marginal Lands), from supporting this important economic sector in South Africa. Combined, this legislation could shut down hunting and spell the end of game ranching in South Africa if improper regulations are adopted and/or improperly implemented. In addition, requirements such as training and belonging to various hunting organizations in order to obtain a firearms license may economically preclude many black South Africans from joining the hunting fraternity, keeping it an exclusive white hobby that in the long-term could be its downfall.

9.8.4 Devolution and CAMPFIRE, Zimbabwe

Legally, communities do not have appropriate authority. As noted, this has been granted to Rural District Councils (RDCs), which are large heterogeneous administrative units rather than production units. Producer communities come at

a lower level (e.g., ward and village). There is thus legal discrimination at this point in time between private farms (wildlife producer units) that control their own revenue and resources and communal producer units that do not. RDCs and district wildlife committees are regarded as remote and with skepticism by rural communities (Wels, 2000). LWAG/DFID (2002) note that through the 1990s, donors began to question the cost-effectiveness of programs like CAMPFIRE in which revenue was retained at the district rather than the village level.

In 2000, the CAMPFIRE Association, which represents local government (i.e. Rural District Councils [RDCs]), voted for devolution of appropriate authority to the level of the producer community. This is at the ward/village level. Wards make up about six to ten villages. Each village agrees on a geographical area of influence. The trophy fee from any animal killed within the area of influence of a given village would go directly to the “producer village”. Concession fees were to be divided, 20% would go to the RDC and the remainder would be divided among the villages. The safari operator would pay respective fees directly to the respective village or RDC. This would have been a major change in a number of ways: 1) “producer villages” would be recognized and would receive direct benefits, the amount determined by the level of protection provided to wildlife and thus its availability for trophy hunting, 2) thus it would be in the interest of each “producer community” to protect its wildlife and 3) the cash would flow directly to the producer community as opposed to the past difficulty of extracting its share from local government.

Chiredzi RDC was the first local government to implement this new process (Sithole, *pers. comm.*). Linked to this have been attempts to create village run trusts as in Botswana. All of this is theoretical as Rural District Councils (RDCs) have resisted this change (Sparrow, *pers. comm.*; Duffy, 2000) and it is doubtful that much will happen until the post-Mugabe era. Duffy (2000) argues that this

coercive conservation assists in the expansion of state control over rural areas. She believes that as a result of World Bank/IMF driven structural adjustment policies (SAPs) and declining revenue to both central government and Rural District Councils (RDCs), rather than devolve authority to the wards and villages, attempts will be made to re-centralize control over this income.

Murphree (1997) is even blunter about how far devolution might go and raises concerns over the future of CAMPFIRE:

“At the national level the economic performance of the (safari) industry has attracted the attention of the political elite and their private sector allies, who seek to appropriate a higher share of its value through patronage, shrewd negotiation or bureaucratic re-centralization. CAMPFIRE, which from its conceptualization had profound political implications, has through its relative successes now become a high-profile arena of political maneuvering with outcomes which will remain dynamic and dependant of the strength of its constituency”.

The constituency are the rural uneducated poor, who unless they have a champion in the form of national or international leadership will be taken advantage of until they themselves are sufficiently educated to be able to maneuver within the system and stand up for the rights of the greater good.

Murphree (1997) discusses the compartmentalization of natural resources in different ministries, the reason that up until now CAMPFIRE and most CBNRM programs have been mainly about wildlife and fisheries linked to hunting and tourism. Timber and mineral resources are other important sources of revenue over which communities will need to negotiate user rights if CBNRM evolves in Africa.

9.8.5 Devolution, ADMADE and LIRD, Zambia

9.8.5.1 ADMADE

In 2001, then President Frederick Chiluba closed hunting – reopening in 2003. While corruption was given as an excuse, the problem appeared to lie in a struggle over control of the presidency and political power of the country. It is believed that Chiluba closed hunting to get back at very powerful political individuals who were in the opposition party, including:

- Ben Mwila, possibly the richest man in the country and uncle to Chiluba;
- General Tembo; and
- Two senior politicians whose names were not forthcoming.

It is also alleged that closure of hunting was linked to punishing powerful elements within the Indian community who controlled hunting. The Indian community that originally helped put Chiluba in power backed a pressure group within the ruling party against Chiluba running for a third term.

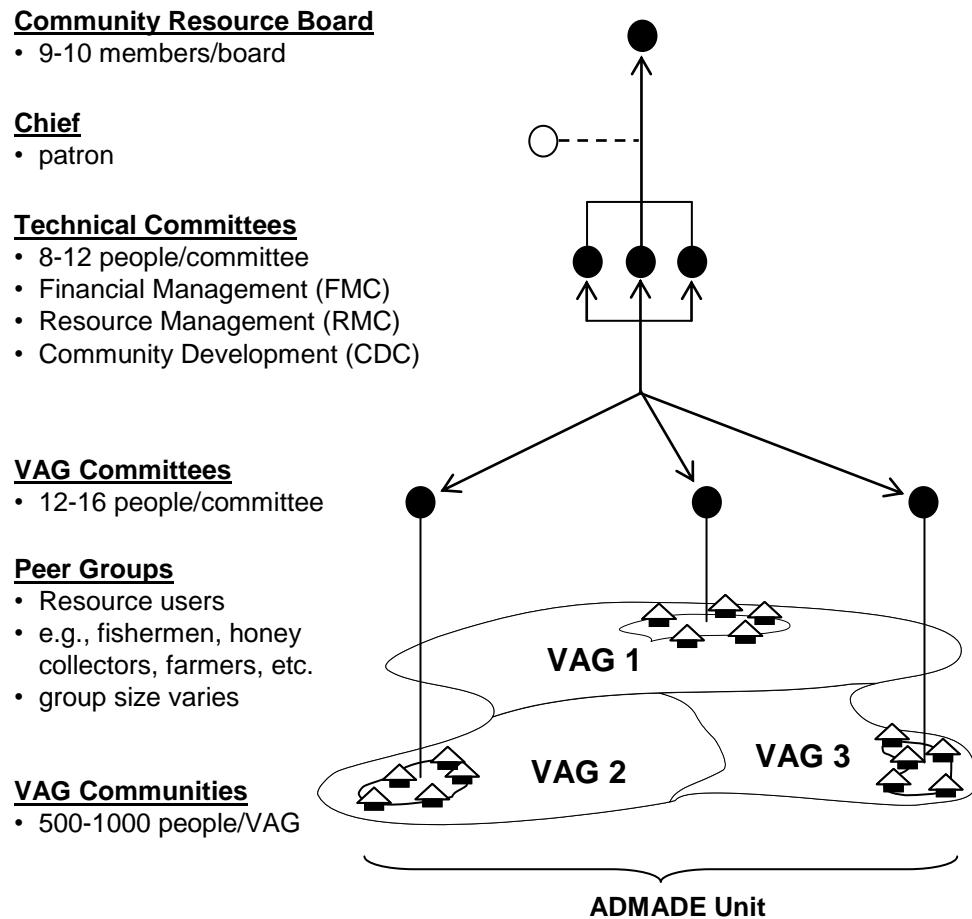
At least four of the 19 safari companies had high-level opposition politicians involved. Based on a confidential EU report, ZAWA's finances for 2001 were expected to be as follows (DeGeorges, 2001b; SCI Africa Office, 2001b):

<u>Source</u>	<u>Billions of Kwacha (K)/US\$</u>	<u>% Of Total Revenue</u>
Government	8.7/2,861,842	39.6
Non-Consumptive Tourism	3.0/986,842	13.6
Hunting	10.3/3,388,157	46.8
GRAND TOTAL	22/7,236,841	100
Kwacha 3,040/US\$ in 2001		
DeGeorges (2001b; DeGeorges In: SCI Africa Office, 2001b)		

With the closure of hunting, the deficit to ZAWA in the report was estimated at K 19 billion (US\$ 6,250,000) (Not sure how they came up with that figure – possibly from a combination of revenue loss plus declining government support). The government had reduced its contribution to ZAWA from K 8.7 billion (US\$ 2,861,842) to K 3 billion (US\$ 986,842) in 2001 (SCI Africa Office, 2001b). According to ZAWA (2002 *In:* de la Harpe, *et al.*, 2004 *In:* Child, 2004a), the proportion of the national budget allocated to wildlife dropped from 0.29% in 1966 to 0.10% in 2002. In 2001, salaries had not been paid for three months, staff being forced to live off of credit. Without support from the communities and safari operators, the cost of being in the field and employing staff to save the wildlife was estimated to rise to K 36.7 billion (US\$ 12,072,368). According to the confidential report, donors were losing confidence in Zambia due to the closure of hunting. This was a very interesting statement being made about donors representing countries with large animal rights movements who would be happy to see hunting closed (DeGeorges, 2001b; SCI Africa Office, 2001b). By comparison, in 2005 out of a gross income to ZAWA of Kwacha 44,124,000,000 (\approx US\$ 10 million) the amount of 13,771,000,000 (\approx US\$ 3.1 million/31%) came from hunting license and concession fees, \approx US\$ 2.3 million/23% from park income, \approx US\$ 2.5 million or 25% in donor grants, \approx US\$ 1 million/10% in government subsidies and \approx US\$ 992,954/9.9% from exchange rates and other income. Although pressure is being placed on ZAWA to give up more revenue from hunting to GMAs they cannot afford to until alternative sources of income are found (e.g., increased revenue from expanding non-consumptive tourism or restructuring of hunting fees) (Hamilton, *et al.*, 2007) (see Section 9.5.2, ADMADE, Zambia).

Transformation is taking place. The Wildlife Management Sub-Authority (WMSA) structures will be replaced with democratically elected Community Resource Boards (CRBs), whereby the chief holds a non-voting honorary position

(Lyons, 2002). Legislation in 1998 makes provision for CRBs (Jones & Murphree, 2004 *In: Child, B.*, 2004a). It appears that CRBs are linked to Village Area Groups (VAGs) (ADMADE Foundation, 1999; Lyons, 2000) as discussed under LIRD (see Section 9.8.5.2, LIRD) (Figure 9.4).



Source: Lyons (2000) with permission, Lyons.

Figure 9.4: ADMADE organizational structure for a single game management area (GMA)

These CRBs have been set up in most areas, but because of ZAWA's long restructuring, none have been legally registered. With no money from safari hunting in 2001 and 2002, the proof of how these CRBs and ZAWA will function has yet to be emerge, with revenue flows yet to come in. In addition, ADMADE is

now much more focused on supporting poverty and food security issues, which is showing positive results particularly in the Luangwa Valley (Lyons, 2002). Who will pick the hunting concessionaires? Will cash flow directly from the safari operator to the CRBs or still flow through the awkward, centralized and unaccountable revolving fund? According to Jones and Murphree (2004 *In: Child, B., 2004a*), the money still appears to flow through the centralized revolving fund, where in neighboring programs such as Botswana and Namibia, income from wildlife goes directly to the communities. The continuation of the revolving fund is implied in the ZAWA (2004) draft CBNRM document. Time will tell, but with the majority of rural communities poorly educated and organized, at this point in time it is not too hard to guess who will dominate among key actors. According to Simwanza (*pers. comm.*), who will undertake a masters thesis on the subject (Simwanza, 2007), CRBs in 2005/2006 are operational.

Haller (2004), speaking on CRBs around the Kafue, though it is likely the case throughout the country, states

“the formal wildlife regulation – before and also after the Zambian Wildlife Act of 1998 - requires a modern gun and one has to buy an expensive license that locals cannot afford (*ibid*). Even if they could afford to buy a license the transactions costs of getting to know where and how to get this document in the urban centers are too high. If local people get caught hunting or only in the possession of game meat, they are fined heavily: We were told of people who were sentenced 5 years of prison for only possessing game meat. Additionally, there are reports that locals were shot by game scouts, who are now monitoring the Lochinvar Park and the neighboring Game Management Area (GMA 11). Nevertheless, monitoring is far from being perfect, game scouts are badly paid, transport facilities are bad and the morale of staff is bad too. There are also complaints of local people claiming that the scouts are poaching themselves. So there is no trust whatsoever in the work of the state that shall control the CPR (Common Property Resource)...locals are ignorant of the existence of the CRBs and the money goes directly to accounts controlled by the chiefs or

staff of the chiefs. So the local population as well as the chiefs themselves view that the government is taking away the resource from them, which in their eyes once belonged to them. They therefore do not see the need to protect the animals. But even if money is invested in schools and clinics this gain cannot compensate from the loss they have and also will not exclude free riders from hunting and using these facilities...One part of the population, especially young men, continue hunting - or poaching as the term is used by officials AND locals - with dogs and self made guns in remote areas in the Kafue Flats, where they know that the scouts will not reach because of dangerous animals (crocodiles and hippos). The meat is then dried and sold locally to the people or to traders (male and female), who then sell it at the tarmac road or they travel to Lusaka in order to sell it there. Most of the people hunting want to get access to the resource before it is taken away by commercial hunters from the cities. Those have the money to buy the licenses and are well equipped with modern guns and pick up cars on which they carry deep freezers. Locals claim that these hunters also do pay the game scouts in order to shoot more animals than is issued on the licenses. There are also illegal hunters from town hunting themselves or hiring local hunters" (see Chapter 7, Section 7.9.9.4, Kafue, Zambia).

Child, McKean, *et al.* (2004 *In: Child, B., 2004a*) claim that financial systems are now sound and accountable and for the first time in at least a decade the allocation of hunting blocks

"has not been associated with intrigue, disputes have mostly been settled in court and contracts are clear and transparent".

It is hoped that this is true and remains the case. Inside sources (Anon 2005, *pers. comm.*)²⁹² explain that the system is still corrupt and based on patronage heavily linked to ZAWA's commercial services division, with the Indian community once again heavily controlling/influencing the allocation of hunting blocks and thus hunting in Zambia. Simwanza (*pers. comm.*) explains that in 2006, an external audit exists creating an aire of transparency with funds arriving in a timely

²⁹² Anonymous. Name withheld to protect the integrity of the informant.

manner at the level of the CRBs not being an issue. The problem now is transparency by the CRBs in what they are doing with the communities' income. When accounted for, most income is still used for common property benefits, and though it is increasing, it is still relatively meager at the household level.

At the same time, because ZAWA is a parastatal and no longer receives government funding, there is concern that ZAWA is in the process of extracting too much money from what should be community tourist income, resulting in a disincentive to communities to conserve their wildlife (Child, McKean, *et al.*, 2004 *In:* Child, B. 2004a). Faddy (*pers. comm.*) was concerned that neither the income from hunting nor eco-tourism would be enough to financially sustain ZAWA as a parastatal since the overall tourism industry of Zambia is just too small. De la Harpe, *et al.* (2004 *In:* Child, 2004a) believe that this illustrates the dangers of imposing financial self-financing too quickly on an agency with so much power.

A recent study by the Hamilton, *et al.* (2007) found that there were neither welfare gains nor losses associated with living in GMAs or participating in CRBs/VAGs for poor households, while non-poor households in GMAs would significantly be worse off if their community had not been declared as a GMA or they did not participate in CRBs/VAGs. This implies an inequitable distribution of benefits (elite capture) to the more politically connected and better off households in GMA village society.

9.8.5.2 LIRD^P

The next-door Luangwa Integrated Resources Development Program (LIRD^P) since the mid-1990s has attempted to devolve more authority down to the village level. In 1996, LIRD^P's review and policy committees (comprising senior civil servants) approved a new CBNRM policy for the project. The turnaround in the

community program and all later progress in the CBNRM program can be traced back to this four-page document (Child & Clayton, 2002). Village Area Groups (VAGs) were created of which there are 43, representing an average of 116-163 adults/VAG.

“VAGs were constituted at a scale that ensured the face-to-face participation necessary for grassroots democracy in largely illiterate communities (roughly 200 households)/VAG. The revenue distribution process became the driving mechanism” (Child & Clayton, 2002).

Each of the 43 VAGs committees consists of ten elected members that meet monthly. Child and Clayton (2002) believe that

“the probability of a community program being successful is linked strongly to scale, because operating at Village rather than Area level allows the harnessing of the power of participatory democracy and downward accountability”.

While it is important that elections are regular, there is regular accounting and reporting to the village, and while the chief plays a role, he is no longer the sole decision-maker. The latter issue is important since in recent times “chiefs” tend to be government employees with more allegiance to the bureaucracy than their people and as described in ADMADE (see Section 9.6.2.2, ADMADE, Zambia) have tended to use their power to expropriate income, quotas and other tools of power in order to retain power through client/patron relationships.

Money from the Lupande GMA was banked in a joint account with community and project signatories. The money was split: 1) 80% to VAGs, 4% to ADCs²⁹³,

²⁹³ Each of the six chiefs in the LIRD program has an area development committee (ADC), with three to ten VAGs/ADC providing a coordination role and oversight in wildlife management. Because of the chief being above auditing, the ADCs were less accountable and less transparent than the VAGs and were therefore also less capable of implementing projects and hence experienced more misappropriation of funds than VAGs (Child & Clayton, 2002)

3) 6% +/- 2% to chiefs and 3) 10% contingency (reserved to employ ADC executive secretaries) (see Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa, LIRD, Zambia). Revenue from the two hunting concessions in the GMA is divided equally between six areas, one for each traditional chief. The VAGs within the areas meet to determine how money is to be distributed between VAGs. Each VAG then determines what percentage of its income goes to projects (common property benefits), households (*tyolela*), VAG administration and wildlife management (Child & Clayton, 2002). Continued weaknesses of LIRD include (Child & Clayton, 2002):

- Administration of LIRD is expensive and heavily dependent on outside donor funding for expatriate and national staff, US\$ 2 and US\$ 4/person/year (45,000 people), but cheaper than many, at less than a quarter the cost of Namibia’s program in the Caprivi area. This funding has been significantly reduced in recent times.
- It appears that LIRD staff determines if VAGs fulfill predetermined requirements prior to releasing money – still a top-down process. What will happen when the LIRD project ends? Who will assess and continue demanding audits? Will this come from the VAGs themselves?
- While there have been some attitudinal changes, “poaching” in some villages is still an issue.
- As in ADMADE, there is little transparency in the awarding of hunting concessions, resulting in a major loss of revenue to rural communities (e.g., much of the quota allocated as meat to non-resident hunters for political favors). As a result, Zambia earns less than 10%/unit area compared to Zimbabwe, South Africa, Namibia and Botswana.

The dependency on project donor funding and outsiders controlling the flow of benefits puts into question the long-term sustainability of this program, unless

LIRD^P and similar CBNRM programs can be weaned off donor handouts and create their own transparent processes that members of the community can trust.

“Because this is so frustrating, many projects have by-passed inefficient government systems, setting themselves up as mini-bureaucracies but, usually, these have collapsed once the project has ended” (Mellors, 1988; Dalal-Clayton & Dent, 2001 both *In: Child & Clayton, 2002*).

The success or failure of what LIRD^P leaves behind can only be determined once LIRD^P ends - by an evaluation, maybe two years later!

9.8.6 Devolution and LIFE, Namibia

The concept of a bottom-up CBNRM program was further defined in the review of the Namibia CBNRM Living in a Finite Environment (LIFE) Project (USAID, 2001) with recommendations towards moving in the direction of truly empowering local communities – in this case community-based conservancies to make their own decisions. The following is an alternative structure or vision for the National CBNRM Program that (Figure 9.5):

- Places democratic grassroots representation center-stage as the legitimate lead organization;
- Insists on conservancy committees developing “democratic roots” into their constituencies;
- Maintains the invaluable Namibian Association of CBNRM Support Organizations (NASCO)²⁹⁴ Namibian Government (GRN)/ NGO coalition, but in a supporting rather than central role. (NACSO-coordination, NGOs-delivery); and

²⁹⁴ The Namibia Association of CBNRM Support Organizations is an umbrella association of 12 CBNRM service organizations (11 NGOs and the University of Namibia) providing services to communal area communities seeking to manage and utilize their natural resources in an equitable and sustainable manner. <http://www.nasco.org.na/introduction.htm>.

- Strengthens the ability of communities to work with the Ministry of Environment and Tourism (MET) and other agencies to fulfill the policy of supporting the rights of rural formerly disadvantaged Namibians.

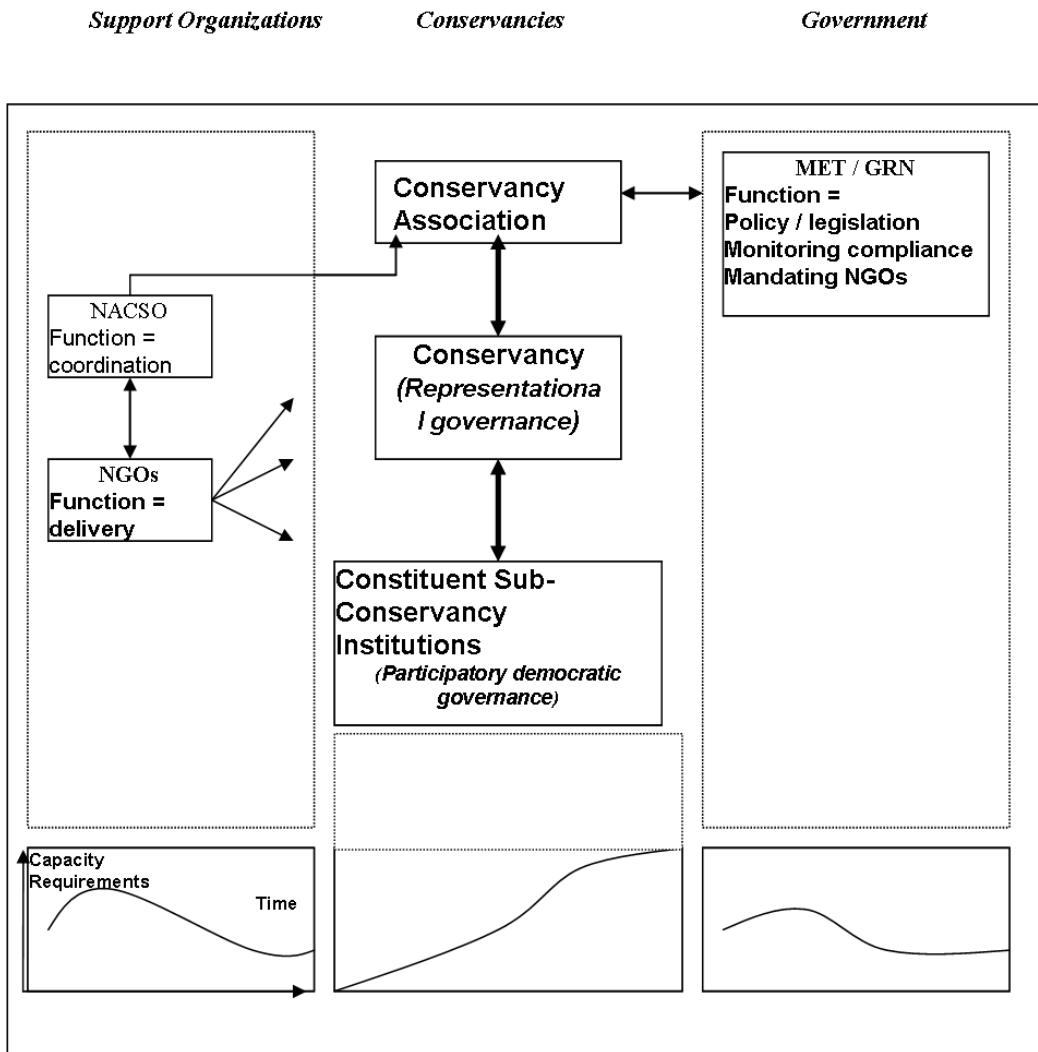


Figure 9.5: Evolution of empowerment and capacity in Namibian conservancies

With time, as conservancy capacity builds up, support and involvement from outside organizations should decrease as shown in the accompanying chart. A major emphasis is placed on creating a transparent and democratic environment within the conservancy system, something that is a weak link in most CBNRM

programs in Africa. In summary (USAID, 2001): 1) it needs to be based on sound, democratic participatory organization, 2) it needs to take advantage of the opportunities for commercial enterprise development to make money and achieve financial sustainability, 3) it needs to ensure sustainability, especially of the wildlife and resource base, 4) it needs to keep the social dimensions and dynamics clearly in view and monitor to insure equitable impacts and 5) the program needs to develop grassroots legitimacy and the democratic ability of its constituents to empower themselves. It is not sure what is meant by democratic in this sense, though it has probably been added as part of the Western donor political rhetoric. As noted in Section 9.7.4.2, Ignoring cultural constraints in institution building, LIFE, Namibia, Nyae Nyae Conservancy, the egalitarian society of the San people does not necessarily mean an easy transformation into democracy and other Western institutions. It would have been better to say that the majority of the people in the conservancy have a say in how their resources are used and managed and in how benefits are distributed. The LIFE-II evaluation also recommended the “opening of doors” to other stakeholders such as the private sector, which currently plays a key role in helping conservancies market their resources. Additionally, institutional strengthening is mentioned as a key need, with little mention of how this should take place.

9.8.7 Ilngwesi Lodge, Mukogodo Pilot Tourist Program, Kenya

The following information was provided by Gilfrid Powys (*pers. comm.*), a rancher in Laikipia, Kenya. Though on a local scale and not countrywide, this case study demonstrates that rural Africans can organize and successfully run exclusive facilities catering to high-paying overseas tourists.

9.8.7.1 Location

The IIngwesi Lodge in the IIngwesi Group Ranch is located on 60,728 ha (150,000 acres) east of the Mukogodo Escarpment at an elevation of 4,000 feet mean sea level (MSL) and is part of a group ranch owned by 450 families. It is on the northern boundary of the Lewa Wildlife Conservancy and the Borana Ranch (Gilfrid Powys, *pers. comm.*). According to Barrow, *et al.* (2000), this group ranch is on 8,600 ha with about 600 members, and provides important wet season habitat for giraffe and elephant coming from the 30,000 ha Lewa conservancy. Watkin (2003) estimates 400 households representing 3,000 people on 16,000 ha with 8,000 ha designated as a conservation area.

9.8.7.2 Illaikipiak Maasai

The people in this area are traditional hunter-gatherers, the Ndotobo-Maasai. *Ndotobo* means blacksmith in the Maasai language of Maa. They are survivors of intra-Maasai conflicts, raids and wars over-grazing range and water points. Their original name was the Illaikipiak Maasai. Their disintegration resulted in the assimilation of the remnants of the Illaikipiak Maasai by the Ilmookodo hunter-gatherer Cushitic group occupying the Mukogodo Forest. Today they are called the Illaikipiak-Ndotobo Maasai (Powys, *pers. comm.*). Culturally, they hunt, gather honey and wild fruits and have livestock. Barrow, *et al.* (2000) call them the IIngwesi.

9.8.7.3 IIngwesi Lodge funded by AWF through Laikipia Wildlife Forum

Money provided by the African Wildlife Foundation (AWF) through the Laikipia Wildlife Forum helped to construct the IIngwesi Lodge. This lodge is owned and operated by the IIngwesi Group Ranch. It has a decision-making board composed

of elders from the group ranch and two members of the Laikipia Wildlife Forum. Tourist safari hunting (if hunting ever re-opens in Kenya) and eco-tourism will generate income from this lodge and its environs. Wildlife from the private ranches of the Laikipia Wildlife Forum will be used to restock this area. Already, snaring has been virtually eliminated as the community begins to derive benefits from this lodge. According to Barrow, *et al.* (2000), the group ranch formed the *IIngwesi* Co. Ltd. and was given a grant by the Liz Claiborne Art Ortenberg Foundation, with the African Wildlife Foundation (AWF) and Kenya Wildlife Service (KWS), which was completed in December 1996.

It is important to note that though NGOs and government helped fund the start-up of this program, it appears to be entirely run through the Laikipia Wildlife Forum, which is composed of private entrepreneurs, Laikipia ranchers, who used entrepreneurial moneymaking skills to help this program become successful.

9.8.7.4 Benefits to local community

The lodge is rented at US\$ 250/night for the entire lodge. This is generating about US\$ 50,000/year for the community (in 1997), work benefits and most importantly restoring pride to these rural people in that they are beginning to feel secure over their futures (Powys, *pers. comm.*). Barrow, *et al.* (2000) confirm this annual income. If there are 450 families, this amounts to a gross of US\$ 111/household. According to Watkin (2003), they are earning about US\$ 38,000 (Ksh 3 million)/year of which 33% goes to employment, 33% to ecotourism operating expenses and 33% to community benefits including school improvements, scholarships, and provision of health facilities. Averbeck (2001) estimates profits of US\$ 21,000/year in which a board of trustees and members have so far used proceeds, as in most CBNRM projects, for common property benefits (e.g., dip tanks for cattle, renovation and building of schools, purchase of

vehicles, improvement of the communication system, roads, scholarships for students, funding of water projects). Everyone from the cook, guides, managers, etc. comes from the local community and this is considered one of the top rated lodges in Kenya. They also explain that it employs 26 people and that marketing and bookings take place in Nairobi. Other important factors often missing in CBNRM projects are:

- All expenditure is authorized by a general meeting of the group ranch members where a quorum needs to be present in order to make any decisions;
- Accounts are audited – creating an atmosphere of transparency and accountability missing in most CBNRM programs; and
- The sophisticated white entrepreneurial ranchers acted as “mentors” to the group ranch in everything from design of the lodge to training personnel to marketing

“The community is using money generated from the project for construction, school bursaries and has bought a vehicle to assist with security and transport of sick people to the nearest clinic. Future revenue will be distributed to individuals and some left over for social facilities.

Several lessons have been learnt. Grants can be used to 'kick start' important conservation projects that can have positive impacts on attitudes and the socio-economic well being of local communities. The interest, commitment and partnership with neighbors who have experience and expertise can also be indispensable. The role of the Lewa Conservancy was critical in this project. Finally, proper institutional set-ups at the local level, systems for marketing the tourism product, training of local people and proper financial procedures were all important ingredients in the success of this project. Attitudes in this community have changed and wildlife has once again become the 'second cattle' ” (Barrow, *et al.*, 2000).

Nyika (*pers. comm.*) is concerned that a major problem is looming. The Lewa Conservancy undertakes all marketing and booking for the lodge. The community is not being trained in marketing and management and thus has no idea of cost/benefits nor how profits are split since accounting is not transparent. These issues need to be addressed with exposure of key community members to the overseas market, as well as training in management and marketing. The Lewa Conservancy, an honorable operation, must slowly divest itself as a middleman.

9.8.8. Rwenzori Mountaineering Services (RMS), Mountain of the Moons, Uganda

This is one of the more successful community businesses in Africa. It is described in some detail in Chapter 11, Section 11.11.3, Rwenzori Mountains National Park - a success story of rural people managing a natural area, and then foreign aid and NGOs arrived.

9.8.9 Gestion des Terroirs, West Africa

When the principal author left West Africa in 1988, the approach to natural resource management by *les agents des eaux et forets*, the game guards of Francophone Africa, was one of repression against the rural communities and was failing. Today, their approach to conservation appears to be further ahead than in Southern Africa, the birthplace of CBNRM. Devolution is not 100%, but close. It still remains to be seen how much of this is donor driven and how much comes from the government truly believing in this process. If it can be made to work, local communities will be empowered to basically own, manage and obtain the majority of the benefits from the sustainable management of their natural resources. A major shortcoming of achieving this success is the lack of tertiary training of community members in various technical areas. Unfortunately, to

date, the World Bank money managed by the government for this process has not deemed such training a priority, preferring to train more government bureaucratic elites far, removed from this program on-the-ground.

9.8.9.1 Management of the Comoé-Leraba Game Reserve, southern Burkina Faso

“Biodiversity loss has reached critical proportions in West Africa. Burkina Faso, an impoverished Sahelian country, is trying to reverse the trend through sustainable management of woodland forests and wildlife. Although somewhat successful, these efforts are curtailed by inadequate financing, capacity, and incentive, as well as increasing pressure from a growing population. Consequently, the country is having difficulties in maintaining its critical ecosystems” (World Bank, 2000).

As over much of Francophone Africa, a system of classified forests (*forêts classés*) was established, these forests being officially off limits to local communities. Traditional controls over accessing Common Property Resources were turned into open access public resources whose management was controlled by the state but whose authority was rejected by the rural populace, while rural small-scale societal management systems were degraded or eliminated. Access to the resources became a free-for-all as these resources were mined for short-term gains by anyone from within and outside the community. This “tragedy of the commons” in some cases took place through patronage systems, where the government encouraged the mining of natural resources that had been managed by communities for centuries (see Chapter 5, Section 5.6.1.1, Impacts of colonialism on agriculture and pastoralism in the Sahel, Groundnuts, Mourides and Land Degradation in Senegal, and Section 5.9.4.7, Deforestation in savanna environments, Deforestation in Senegal Linked to Charcoal Making, Over-Population and Declining Fallow Periods).

Today, protected areas are administratively consolidated by sets of two or three in a Wildlife Conservation Unit (WCU). Burkina Faso contains 13 WCUs. Four WCUs are targeted by Global Environment Facility (GEF) funds: Sahel (several new protected areas in the northern part of the Sahel: Nassoumbou, Séno Mango, Beli, Oursi, Darkoye), Comoé (the Comoé-Léraba Reserve and Boulon-Koflandé Gazetted Forest), Bobo Dioulasso (Mares aux Hippo Biosphere Reserve) and Nazinga (the Kaboré Tambi National Park). The National Natural Ecosystem Management Program (PRONAGEN) will help secure natural habitat and wildlife in about 400,000 ha of the Sudanian savannah, 200,000 ha in the Sahel and several hundred ha of wetlands in the Sahel. Significant restoration is expected in the 100,000 ha (World Bank, 2000) to 125,000 ha (AGEREF, 2006) Comoé-Léraba Reserve.

With support from the World Bank through GEF as a funding mechanism, communities establish inter-village protected area management associations (AGEREFs) to become entrusted as concessionaires. AGEREFs' members are representatives of the *comités villageois de gestion du terroir* (CVGTs)/village management committees of all villages located in the periphery of a protected area. Some investments in protected areas and utilization of wildlife and tourism are delegated by the concessionaires to private professionals (World Bank, 2000).

In Burkina Faso, a program has been undertaken in which the local Dozo hunters guide overseas hunters and undertake anti-poaching and wildlife monitoring in the Comoé-Leraba Game Reserve (see Chapter 2, Figure 2.1: Dozo “professional hunters” Burkina Faso).

The World Bank has signed a five-year agreement with the government to devolve authority to villages around the Comé-Leraba Game Reserve to sustainably manage their wildlife and other resources (Pavy, *pers. comm.*).

Chasse Libre

The economic foundation for the program in the Comoé-Leraba Game Reserve is *chasse libre*. *Chasse libre* or self-guided hunting is a form of hunting in which there is no “great white hunter”. The sport hunter hunts with a traditional “great black hunter”, who until now has been seen by governments and Western NGOs as a poacher. *Chasse libre* mainly takes place in Francophone Africa, especially Cameroon, and is better known to Europeans who have closer ties to Africa and who are often multilingual. Hunting tends to be either by classical foot safari with porters or out of primitive camps sites. It is a market niche for the younger, fitter and less affluent with a sense of adventure, who do not expect “champagne” breakfasts and who are prepared to sit around the campfire and learn about the unique cultures and beliefs of the traditional hunters who serve as their guides, trackers, skinners, porters and cooks.

Fees are lower for the daily rate since the overseas hunters rent their own vehicles, buy their own food, bring their own camping gear and overcome what bureaucratic red tape there is, such as temporary import permits for arms and the purchase of a hunting license, trophy preparation, export documentation and shipping. If a “great white hunter” was employed, he would keep the daily rate anyway (see Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders). Therefore, whatever the community charges for the daily rate is a bonus to the community. Just as important is the fact that the community has the pride and dignity of running its own program and being its own boss. With time, as the community’s ability to provide more sophisticated accommodations and services improves, the potential exists to increase income from raising the daily rate.

Comoé-Léraba Reserve

This reserve is found in Banfora and is about a five-hour drive southwest of Ouagadougou. Then another one and a half hours is required to reach the village of Folonzo and another 15-20 minutes to enter the Diefoula Reserve. The Diefoula (Comoé-Leraba) Game Reserve is 125,000 ha. Plans exist to create a wildlife corridor between the Boulon-Koflandé Forest and the Comoé-Leraba Game Reserve, which are linked to the two rivers that join on the southern border of the reserve and which also form the boundary with the Ivory Coast. Contiguous with this reserve, just across the river in the Ivory Coast, is the 130,000 ha Warigué Reserve. Just southwest of Warigué lies the Comoé National Park. Plans exist to create a transfrontier game reserve between the two countries, co-managed by rural communities. However, the civil war in the Ivory Coast is detracting from this goal (DeGeorges, 2003a).

Seventeen villages have created their village management committees - *comités villageois de gestion des terroirs* (CVGTs) and federated them in an inter-village association for the management of natural resources and wildlife/*association intervillageoise de gestion des ressources naturelles et de la faune* (AGEREF). They have allocated 125,000 ha to biodiversity conservation and drafted a management plan. The government has legally recognized the AGEREF (as an association) and is in the process of granting it concession over the gazetted forest.

All income stays with the community, including trophy fees, the daily rate and all employment. Paying trophy fees directly to the AGEREF (e.g., the community) is not possible at this time since the law still says that the trophy fees are taxes to be collected by the government. However, since GEF has been financing a project in these protected areas, they have worked into the grant agreement (which has value

in international law) that the government must pay back the trophy fee to the AGEREF as part of its counterpart financing of the project. This will go on for the next five years while the legal framework is being reformed that should allow direct collection of key economic benefits by the community (Pavy, *pers. comm.*).

All villages have set up their village investment funds (VIFs) and the AGEREF co-manages a conservation fund with the project coordination unit. The “Pilot Community-based Natural Resources and Wildlife Management Project” (GEPRENAF - *Projet de Gestion Participative des Ressources Naturelles et de la Faune* - GEF Project Name) financed or leveraged financing for social infrastructure including wells, rural roads, as well as activities ranging from training, agriculture/livestock conflict management, agricultural research and intensification, soil conservation to micro-credit and literacy. Estimates of wildlife populations are the following (Table 9.19):

Table 9.19: Estimation of the big mammal populations, Comoé-Léraba Reserve between 1997 and 1999

Specie	1997 (730 km ²)	1998 (730 km ²)	1999 (1.000 km ²)
1. Hartebeest	2,435	2,208	2,472
2. Roan antelope	810	979	1,438
3. Bushbuck	155	280	295
4. Oribi	103	197	276
5. Common duiker	103	308	382
6. Red flanked duiker	52	130	170
7. Patas monkey	296	5,145	957
8. Vervet monkey	257	968	975
9. Baboon	237	1177	1,711
10. Warthog	271	371	397
11. Kob	100	1,312	1124
12. Waterbuck	50	60	70
13. Buffalo	100	110	120
14. Hippopotamus	15	20	?
15. Elephant	5	5	?
Total	4,989	13,270	10,387

Source: Echappé (2003) with permission, Echappé.

Data analysis was based on the line transect method at the beginning of the rainy season, within three days using 3-20 km transects with no repetition (Echappé, 2003), so no statistical reliability can be applied to the figures. Nevertheless, if these data are anywhere close to being accurate, this game reserve, which until the intervention of GEF had little or no formal management, has some of the highest concentrations of western roan and hartebeest in West Africa. Might it not be possible that local people were/are much better at managing their natural resources than the state, international NGOs and donors wish to give them credit for?!

The international network of self-guided hunters is going well. The first two overseas hunters from Norway were successfully guided by Dozo (traditional hunters) in 2003. They guided six overseas hunters in 2004 and were fully booked for 2005. Hunting can take place for western savanna buffalo, western roan, western hartebeest, sing-sing waterbuck, harnessed bushbuck, warthog, red-flanked and common duiker. It is estimated that the community could initially earn about US\$ 20,000 (15-18,000) per year from six to seven overseas hunters and more as the game population improves and quotas increase (Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders). There are 20,000 people around this reserve (World Bank, 2000). This amounts to at most US\$ 1/person/year and/or maybe US\$ 7-10/household/year.²⁹⁵ However, there are 17 villages and like most CBNRM programs, this could provide US\$ 1,765/village/year for common property benefits. It is evident that this game reserve, with current wildlife and human populations, falls into the same category of most CBNRM programs both economically and with regards to resource/population ratios that are very low. Where it differs is in the empowerment of communities to run, operate and protect the reserve.

²⁹⁵ Based on personal communications with Morgan Echappé (*pers. comm.*), Technikon Student on this project, there are about 10 persons/household

Major hurdles that this program must address include:

1. Using Dozo hunters to undertake anti-poaching. Poaching is a major problem as depicted below since the reserve has been an “Open Access Resource” for many years;
2. Immigration of farmers from northern Burkina as the land becomes over-used, some places in the north having 90-120 people/km², placing pressure to open the game reserve for agriculture;
3. The community has hired a sociologist who comes from the area to advise them, which is a real bonus. Now, however, funding must be found for some youth from the area to study nature conservation/wildlife management so that the community has in-house capabilities;
4. Traditional hunters must be trained to collect wildlife monitoring data while they are undertaking anti-poaching. Hakizumwami (2000) describes how traditional hunters around Conkouati (Congo Brazzaville) have been used to help estimate the status of wildlife population dynamics – “*increasing, stable, decreasing, disappeared*” - and the approximate distribution map of 47 animal species in the area. Likewise, the anthropologist Stuart Marks (1994) has used Bissa hunters in the Luangwa Valley of Zambia to estimate the status of wildlife populations and was continuing to do so in 2005;
5. *Chasse libre* hunters should also be asked to make observations and GPS them where possible as part of the wildlife monitoring program. This should improve trophy quality and hunter success;
6. Traditional hunting quotas must be established since given the number of villages and the amount of money being made will not stop local hunters, whose identity is hunting, from hunting. Better that traditional hunting be recognized, legalized and authorized so that off-takes can be monitored than continue as an illegal, clandestine activity where the off-take is

unknown, thus making wildlife management impossible. According to Pavy (*pers. comm.*), once wildlife populations reach 70% of carrying capacity plans are for the excess to be harvested as both trophies by overseas hunters and meat by local hunters;

7. The sustainable extraction of other resources such as fish, timber, honey and other wild foods and medicine must be considered as a means of valorizing this reserve and providing livelihoods as a means of justifying to the community its maintenance as a natural system that also directly benefits households, since tourist hunting (sport hunting) on its own is insignificant as currently practiced. According to Pavy (*pers. comm.*), in 2004 this is beginning to happen. The river is being broken into sections and apportioned to various communities to manage and exploit, people are being allowed in for firewood, and there is talk of honey collection. In the 2004-2005 season, while the community netted about \$US 25,000 from *chasse libre*, they netted about US\$ 5,000 from 10 tons of fish (Karama, 2006);
8. It is recommended that hunting guilds be re-empowered to train hunters and to control all hunting activities in the area, since many hunters today are bypassing these guilds, which traditionally controlled who could become a hunter, taught the hunter ethics and determined when, where and what could be hunted. In essence, the hunting guild becomes a modern day sporthunting club and anyone wishing to hunt must be trained by the club, pass their initiation requirements and abide by their ethics – a blend of the old and the new as recommended (see Section 9.7.4.1, Traditional management institutions ignored in favor of Western institutions).

This is already happening in nearby Guinea-Conakry (Oularé, *pers. comm.*). Fairhead and Leach (2003) describe this program in neighboring Guinea-Conakry using the Dozo hunting guilds or *confréries de chasseurs*

(see Chapter 2, Section 2.1.6, Hunting Guilds as a Means of Controlling Access to Wildlife) to manage protected areas and control hunting. This program has support from the government, international and local NGOs and donors. Traditional management systems are being modernized and nationalized. In Guinea-Conakry, there is a National Hunters Association of traditional hunters. At the level of the prefecture, registering hunting societies must sign a nature charter aligning them with national forestry and environment codes to protect endangered species, fight bush fires and reinforce all environmental education and natural resource management programs in the prefecture. In the buffer zone of the *Parc National du Haut Niger*, the chief hunter of each village has been appointed head of a village *wa ton* (bush law) committee and empowered to allocate a limited number of hunting and fishing permits and to regulate who hunts where, when and what, and who sets fires, when, where and how – similar to the past. Fairhead and Leach's (2003) concerns are that this national organization, with Guinea-Conakry's president as a figurehead, has become a de facto army for the government in power. Given that next door the hunter/warrior group Kamajor is operating (see Chapter 13, Section 13.10.2.1, Sierra Leone, war and diamonds) and that many of the rebels in the Ivory Coast civil war are Dozo (Chapter 5, Section, 5.7.4.4, Land reform and civil war in the Ivory Coast), there is concern that this hunters association could develop into an armed political force. Let us hope that this is an over-reaction, since so far, even with rebel movements of Dozo across the border in the Ivory Coast, hunting guilds in Burkina Faso show no indication of such activities. Zeba (1998), in addition to identifying hunting guilds as surviving colonialism and modernization in Burkina Faso, also mentions their existence in Guinea-Conakry, Mali, Senegal and the Gambia, and suggests that these bodies linked to

traditional perceptions of nature can be used as a positive force in conservation; and

9. Benefits from monetary to hunting/resource access rights must be based on the various villages (community factions) abiding by agreed-on rules.

A professional in anti-poaching²⁹⁶ has been hired by the program to provide training to the Dozo. Among other things, the Dozo desire a salary since they leave their families and fields. A meeting between the community and government in November 2003 resulted in an agreement that the community anti-poaching teams can arrest people who are in the reserve illegally and that the teams can have uniforms, though in a different color from those of the military. Also, according to the agreement, these teams will be involved in wildlife monitoring and the valorization of resources from the reserve (AGEREF, 2003).

Pavy (*pers. comm.*) has explained that there is pressure from government for the community to joint venture with a safari operator, who by Burkina Faso law would be black, likely from outside the area and who would likely sublease to a Frenchman. The community is already booked completely for 2005 with *chasse libre* hunters. The safari operator would keep the daily rate so that the community might actually make less money than before, although as noted throughout this document, the pride and dignity of standing on their own and feeling like this is their reserve, their business and their wildlife is every bit as important if not more so than just monetary rewards. Forcing an outside safari operator on the local community would in the mind of the authors be a step backwards in devolution. As of 2007, the community has avoided pressure to move in this direction, maintaining their autonomy. Concern has been raised by Fairhead and Leach (2003) that what appears to be decentralization actually results in more centralization by the state, with additional intrusion by international/local NGOs

²⁹⁶ Raynald Gilon, ex-Belge Special Forces, Katanga, Congo Belge, gilonraynald@yahoo.fr

and Western donors, resulting in more bureaucracy as an impediment to local community autonomy. Time will tell if the government and NGO/donor community are actually willing to devolve full autonomy to this local community and/or will attempt to use *gestion des terroirs* as a means of controlling them through committees and regulations not too different to French colonial indirect rule.

9.8.9.2 Communal natural forest management, Guesselbodi, Niger

Globally, it is estimated that the dry tropical woodland climatic zone occupies 1,250 million ha (1.25 billion ha) of which about 20% are covered with woodland. The bulk of these woodlands, about 64%, are found in Africa. Apart from the Congo Basin and a few other areas, they are the natural vegetational cover over most of the continent south of the Sahara (World Bank, 2003a). They would ecologically be classified as wooded savanna.

The Guesselbodi Project, which was carried out with funding from USAID, was the first major natural woodland management project in the Sahel based on large-scale community involvement. Forests were broken into 15 blocks and each year a given block was harvested, coming back 15 years later to the original block. Livestock was to be kept off a given block for at least one year after it was harvested so as to give the trees a chance to recover mostly through coppicing. Researchers have since found that a six-year rotational period is adequate (World Bank, 2003a).

It should be made clear that community managed forests are not new. In Germany, for centuries, community forests have been commonly managed for wood and game. In the state of Idaho, USA, community-owned forests are

sustainably harvested with income used for the operation of primary and secondary schools.

The Guesselbodi National Forest is located some 25 km southeast of Niamey, the capital of Niger. It is an area of natural woodland covering about 5,000 ha. Ten years after the debut of this project, this forest was perceived as being sustainably managed.

“The Guesselbodi project was especially successful in building an institutional relationship between the Niger Forest Service and the forest stakeholders. The villagers' use of the Guesselbodi natural resources became regulated through a contract between their own cooperatives and the Forest Service. Coming to this agreement involved overcoming resistance from government officials to give up a centralized system in favor of a system where power was shared with the public” (WRI, 1994).

According to a World Bank (2003b) evaluation,

“the Guesselbodi project deserves its pioneering reputation. It showed that, at a technical level, natural woodland management for a sustained firewood yield is possible. It also highlighted, for a wide international audience, the fact that the natural woodlands are far more than a source of fuelwood”.

However, a review carried out in 1993 rather depressingly observed (World Bank, 2003a):

“At Guesselbodi, USAID support has ended, and the activities carried out with project support are now largely discontinued - the systems and institutions created are not functioning as intended. There is poor management of funds, little accountability, and perhaps most importantly, grazing is not effectively controlled following the initial cut. The cooperative no longer has the means to pay guards, nor to pay for soil and water conservation activities, largely because disciplined management of funds was not applied and (as the team was told on several occasions) the cooperative members did not have sufficient managerial or technical skills. (This was indeed a surprising observation in view of the reputation

of the excellent training given at Guesselbodi during project implementation).

Lessons to be learned are that local communities, though they were willing to carry out the forest rehabilitation and protection tasks set for them by the forest service on a paid basis, would not be prepared to continue them voluntarily once the project ended. The Guesselbodi approach was thus not sustainable without continued substantial support from outside donors. If a self-sustaining natural woodland management system were to be devised, it would have to be much cheaper and simple enough for rural people to manage on their own. It would also have to offer such self-evident benefits to local communities that they would be prepared to implement it voluntarily and without external subsidies. The project therefore proposed the establishment of rural fuelwood markets run by a ‘local entity’ such as a village, cooperative of villages, or canton...At the end of 1995, a total of 85 rural markets were in operation most serving Niamey. The total amount of fuelwood sold to Niamey was about 75,000 stéres, about 16% of its total requirement. The total revenue to the markets, less-taxes, was just over 100 million CFA (about US\$ 170,000). About 80% of the total revenues went directly to village woodcutters; about 12% went to village funds; and the remainder went to the market managements. Total taxes were 22 million CFA of which half went to the national treasury with the remainder being allocated between the local forest service and the village community for investment in woodland management and general social welfare initiatives” (World Bank, 2003a).

9.8.9.3 Community-based natural forest management, *Gestion des Terroirs*, Burkina Faso

This program appears to be based on an older Guesselbodi National Forest natural forest management project begun in the 1980s, with lessons learned from the past. The following describes the empowerment of local communities to manage their classified “natural forests” in the “dry tropical woodlands” of Burkina Faso, as opposed to agro-forestry which for the most part was a failure in the 1980s and 1990s and had been imposed on rural communities by western NGOs and donors.

Fruit and nut trees were mainly well received by local communities as part of agro-forestry schemes, but certainly not firewood. Unless the farmer is far removed from the bush, it has been rare that he will wish to grow firewood or livestock forage on his farm, negating the value of agro-forestry in displacing the need for natural forest management.

“The failure of Agroforestry can be summed up as follows: Experts decided the Sahel needed more trees. The World Bank and other organizations (e.g., USAID) spent up to US\$ 6,000 an acre (US\$ 14,820/ha) (using expensive Western NGOs) to grow village woodlots of exotic species that sucked down water levels (e.g., Eucalyptus plantations which no farmer would plant near due to lowering the water table) if they grew at all. Mostly goats ate the seedlings. The idea caused much mirth (laughter) at night when the outsiders (NGOs) jeeps were gone. White men and sleek government officials were telling villagers to pour good water into the ground, on scarce land, for some vague benefit 10 years in the future. Foreigners who stayed to listen learned the equivalent in Bambara, Tamachek, Fulani and Hausa of ‘Gimme a break.’ Foreign experts told Africans not to cut trees” (Rosenblum & William, 1990).

Similarly, Sithole (2004 In: Fabricius, et al., 2004) states that attempts to co-opt community-based resource management committees (RMCs) around the Mafungautsi State Forest Reserve, Gokwe district, Mashonaland, Zimbabwe to plant exotic gum *Eucalyptus spp.* trees were rejected,

“Does it make sense to local people to plant trees when they see the forests as having abundant tree resources”.

Unfortunately, in this case, the valuable timber from the natural forest was given to outsiders (private companies and urban entrepreneurs), while local communities were given limited access to non-timber/minor forest products (Sithole, 2004 In: Fabricius, et al., 2004).

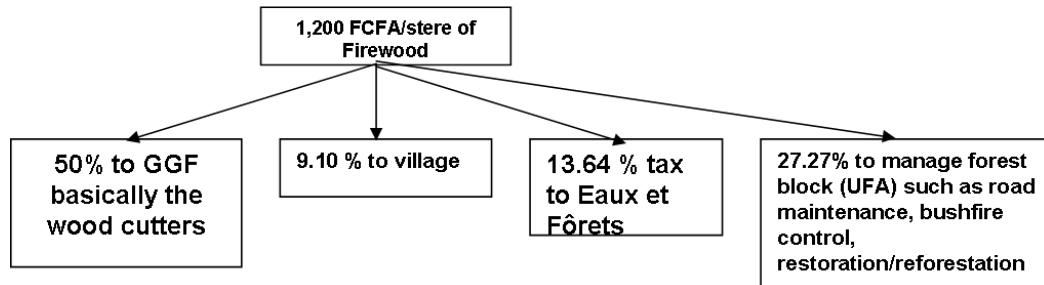
From the principal author's experience covering the Gambia River Basin in West Africa and in his extensive travels and evaluations for USAID in East and Southern Africa, including Madagascar, most tree nurseries lasted only as long as the NGO or researchers were on the spot. People living next to natural forests such as the Bwindi/Impenetrable Forest in Uganda could just not understand why CARE (Food Relief and Development NGO) wanted them to have tree nurseries and plant trees on their agricultural lands [see Chapter 11, Section 11.11.4, NGOs and Eco-Colonialism in Bwindi National Park (BINP), Uganda].

Even when there is a desire to grow firewood, this does not replace the diverse array of resources from natural forests needed by rural people for both subsistence and economic purposes and thus the need for natural forest management, maybe even taking precedent over agro-forestry as a development priority. In Burkina Faso, there is a very complex bureaucracy laid out in the exploitation of these forests. Most important are:

- Forestry management groups/*Les groupements de gestion forestière (GGF)* = forestry management groups, of which one GGF exists for each village – the men that cut and haul out the trees;
- The GGFs exploit forest concessions, *unités forestières d'aménagement (UFA)*;
- The UFA is broken into 15 parcels (*parcelles*) and one parcel is harvested each year through a 15- year rotational cycle; and
- The village-based GGFs are organized under an umbrella body, *L'Union des Groupement de Gestion Forestière (UGGF)* = Union of Forestry Management Groups.

These local level organizations received technical backstopping from the government *Contrôle Technique de L'Etat (CTE)* = the State Technical Control, which consists of the *Direction Régionale de L'Environnement des Eaux et Fôrets* = the Regional Direction of the Environment, Water and Forests, which has the role of monitoring timber harvesting activities, reforestation, forest protection, controlling the timber trade and the management of the forest blocks (UFAs). Fairhead and Leach (2003) describe a similar bureaucratic system in nearby Guinea-Conakry and countries linked to the EU funded Niger River Protection Program and village “forestry groups (*groupements forestiers*)”. Concern is raised that this process becomes a means of relatively autonomous community-created and managed forests becoming absorbed by a predatory state and classified (classified forests),²⁹⁷ placing bureaucratic constraints on the community. What appears as decentralization and co-management or devolution with all of its rules and regulations becomes another move towards centralization.

There is a charge by stere²⁹⁸ for harvested wood. For example, firewood is sold at 1,200 CFA/stere (650 CFA/Euro and about 500 CFA/US\$). This is divided as follows (Ouedraogo, 2000) (Figure 9.6):



Source: Ouedraogo (2000), with permission UN & UNDP.

Figure 9.6 Distribution of income from sustainable forest management, Burkina Faso

²⁹⁷ Village “forest groups” are seen as being a way of the state beginning to control traditional autonomously managed village/community forests, adding to their *fôrets classés* dating back to colonial times.

²⁹⁸ stere = 1 cubic meter = 1.31 cubic yards

The Zone of Silly-Zawara-Pouni – Case Study

This basic approach is being used all over Burkina Faso. The forest of the Zone of Silly-Zawara-Pouni has 35,000 ha of forests managed by a UGGF made up of 50 villages/GGFs, with 50 km of forest roads (Ouedraogo, 2000). Organizationally, the area was traditionally divided into three sectors (Ouedraogo, 2000):

- The villages;
- The soils or lands between the villages (*terroir*); and
- Networks of inter-linked villages (*reseau villageois*)

The village is divided into areas based on lineages, a custom that is slowly disappearing. The *terroir* is an assemblage of all land around the village, based on a pact by the village founder and the genies of the place. Its use is strictly controlled by a number of key members of the village complex in charge of managing the natural resources, including access to cultivatable land and the bush for the purposes of hunting, fishing, gathering and logging. The *chefferie* (chieftancy) is the basis of the village social organization and consists of (Ouedraogo, 2000):

- **The village chief**, who is the traditional administrator and who at times may also play a key role in religious and spiritual activities;
- **The *chef de terre* or the chief of the land**, who is the religious authority and who is in charge of land and its distribution, celebration of worship including sacrifices to assure good harvests and a healthy village;
- **The *chef de brousse* – chief of the bush** – oversees the access to and management of hunting, fishing, gathering, grazing, etc.; and
- ***Chef des marigots*** – oversees the access to and management of water.

The 35,000 ha have been broken into 11 forest blocks, *unités forestières d'aménagement* (UFA). Each block is between 1,883 and 3,875 hectares (Ouedraogo, 2000). In turn, each forest block has been broken into 15 parcels varying between 102 and 197 hectares depending on their production potential. A management plan for cutting is established. Most firewood for auto-consumption comes from opening agricultural fields. There are basically two forms of wood/timber harvests in the forests (Ouedraogo, 2000):

- Harvest of dead wood; and
- Harvest of live “green” wood.

The harvest of “green” wood is based on selective harvests with authorization given exclusively to villages by the forestry service. For “green” living timber, this has been set from January to March each year during the dry season. The harvest of “dead” wood can occur year-round (Ouedraogo, 2000). In a given year, one parcel is harvested, after which that parcel is left fallow for 15 years before returning to harvest the timber resources. In the interim, various other uses can take place within the parcel. Only 50% by volume of a given parcel is exploited, leaving behind vegetation to protect the soil and to naturally reforest an area. Timber to be harvested is marked (Ouedraogo, 2000).

The harvesting technique is based on the concept that most species will coppice. The tree is cut so that the stump is 10 – 15 cm from the ground and the top of the stump forms an inverted “V” to assure that water does not accumulate and rot the stump. Thus, the natural regeneration is preferred to tree nurseries, which have a very checkered history of poor success in rural Africa, unless they are fruit trees (Ouedraogo, 2000).

In each parcel, the following volumes of “green” wood are determined for harvest (Ouedraogo, 2000):

- Firewood is harvested that has a diameter breast height (DBH) (*diametre à hauteur de poitrine* – DHP) of 10 – 25 cm;
- The DBH is greater than 25 cm; and
- The health of the forest in the parcel is also determined, with sick/weak trees slotted for harvest.

Certain species are protected. Once a parcel has been harvested, no livestock is allowed in for 18 months in order to allow the trees to grow large enough that they cannot be destroyed by grazing/browsing livestock, which can eat the shoots of young seedlings/coppicing plants when they are too small (Ouedraogo, 2000).

One obvious need is the formal training of youth from the village in forestry management so that full devolution from government can actually be negotiated between the community and government.

9.8.10 Community Forest Management, Tanzania

Barrow, *et al.* (2000) describe similar natural forest management programs in Tanzania:

“Potentially they will own the forest, as long they can show that they can protect the area from damaging use and degradation. Village forest management plans and detailed rules about forest use have been developed and agreed, and are enforced through village forest watchers”.

This provides a

“practical and low cost natural forest management approach for Tanzania, which can be used both on public lands and reserved forests. It goes beyond the sharing of forest products to devolving authority for management to the villages concerned...Precedents are being set for collaborative forest management through village government on non-reserve forestlands, by gazetting them as local authority forest reserves (e.g., in Babati District, see Wily, 1995; Wily & Haule 1995 both *In:* Barrow, *et al.*, 2000). The district governments appear, however, to retain management control. The relationships between the forest users, village and district government under such scenarios remain unclear. Experience from other countries (Hobley, 1996 *In:* Barrow, *et al.*, 2000) suggests that the creation of local authority forest reserves or village forest reserves, where power is vested in district and village government (respectively), may not lead to sustainable and equitable forest use (Nurse & Kabamba 1998 *In:* Barrow, *et al.*, 2000).

Today, more than 500 villages directly own and manage forest reserves in five of the country's 20 regions. Another 500 or so smaller social units, even individuals, have recognized forest reserves. These figures, and the area under direct community management, currently more than 400,000 ha, grows yearly. Meanwhile, state/people co-management through joint management agreements is getting underway in four of the country's 500 government-owned forest reserves. The new forest law, under draft in 1999, will provide legal recognition of a series of forest reserves to cater for emerging and diverse ownership arrangements including reserves which are owned by individuals, groups, villages, local governments and national government... the Tanzanian state has taken community forestry on board not for purposes of social justice or compromise but as a resource management strategy in its own right. The main competing strategy as reflected in the new National Forest Policy, is encouragement towards the leasing of commercial forests to the private sector” (Wily, 1999 *In:* Barrow, *et al.*, 2000).

9.8.11 Emerging Community Devolution Model - Public/Private/Community Partnerships (PPCP's) - Mpembeni Community Conservation Game Reserve – Hluhluwe Game Reserve - South Africa

The following is taken from the SCI Africa Office Status Report, August, 2000 (SCI Africa Office, 2000b) compiled by the principal author. As a means of developing good neighbor relations with peripheral communities, the KwaZulu-Natal Nature Conservation Service (KNNCS) provides a share of all gate receipts to the ten peripheral communities surrounding the Hluhluwe Game Reserve, many of whom lost land in the creation of this reserve. In 1999, Rand 700,000 (US\$ 118, 644) was turned over to the communities. The *inkosis* (local Zulu chiefs) decided to reinvest this initial money back into a lodge within the reserve as a means of providing more employment for local communities. It is likely that in the future, money will be reinvested into community run enterprises (e.g., lodges, traditional villages, handicraft centers, etc.) on the newly created community-owned game ranch).

Meanwhile, through the efforts of the community KNNCS liaison officer Jabulani Mbhamali, the community learned about the potential of game ranches along the periphery of the reserve. This led to the request by the Mpembeni Community to have a portion of their land fenced up to the main fence of the Hluhluwe Game Reserve. Given the history of fencing, parks and game reserves in Natal in which many communities lost land without compensation, there has been an initial reluctance to see the periphery fence of the Hluhluwe Game Reserve pulled down. This may occur in the future once the community develops confidence that this time they are gaining, not losing, by fencing themselves into a park/reserve.

The relationship being developed between the KwaZulu-Natal Nature Conservation Service (KNNCS), the Mpembeni community and the private sector

is believed to be the beginning of the development of an adaptive model, which can be replicated elsewhere in South Africa. Already, neighboring communities, in particular Semi (2000 ha), Ngolotshe (5,000-8,000 ha) and the Hluhluwe Triangle (1,000 ha) are requesting participation. Eventually, this has the potential of resulting in the formation of a large community conservancy with the fences between them and the Hluhluwe Game Reserve pulled down as around the Kruger National Park, but all owned by the local Zulu communities. Of course, like most of these CBNRM programs, it has a long way to go, but unlike most, the people own their own land, and once the wildlife is on their land, it belongs to them.

Trevor Shaw,²⁹⁹ owner, and Nic Vaughn-Jones, the then manager of Zulu Nyala Lodge, took interest. Vaughn-Jones had worked in the old Natal Parks Board and maintained contact with his colleagues. When he heard about the desire of the Mpembeni community to get into game ranching, he and Shaw said “Why not? We want to give something back, help overcome the inequalities of the past. We have already developed three money making game reserves (Phinda, Zulu Nyala, Shaka Zulu Heritage Lodge), why not bring the same success to the local communities”.

Safari Club International (SCI) provided a no interest US\$ 10,000 loan to the Mpembeni community to fence a portion of their land, about 2,000 ha, into the main fence of the Hluhluwe Game Reserve. This money must be paid back within five years and will roll over in helping to fence other communities into the reserve. The idea, developed by Trevor Shaw, is, “Let’s give them a HAND UP not a HAND OUT”. The welfare dependency mentality developed by the donors in Sub-Saharan Africa must be broken. People must learn that they have the natural resources and, if properly managed, they can provide employment and finances to develop and uplift themselves.

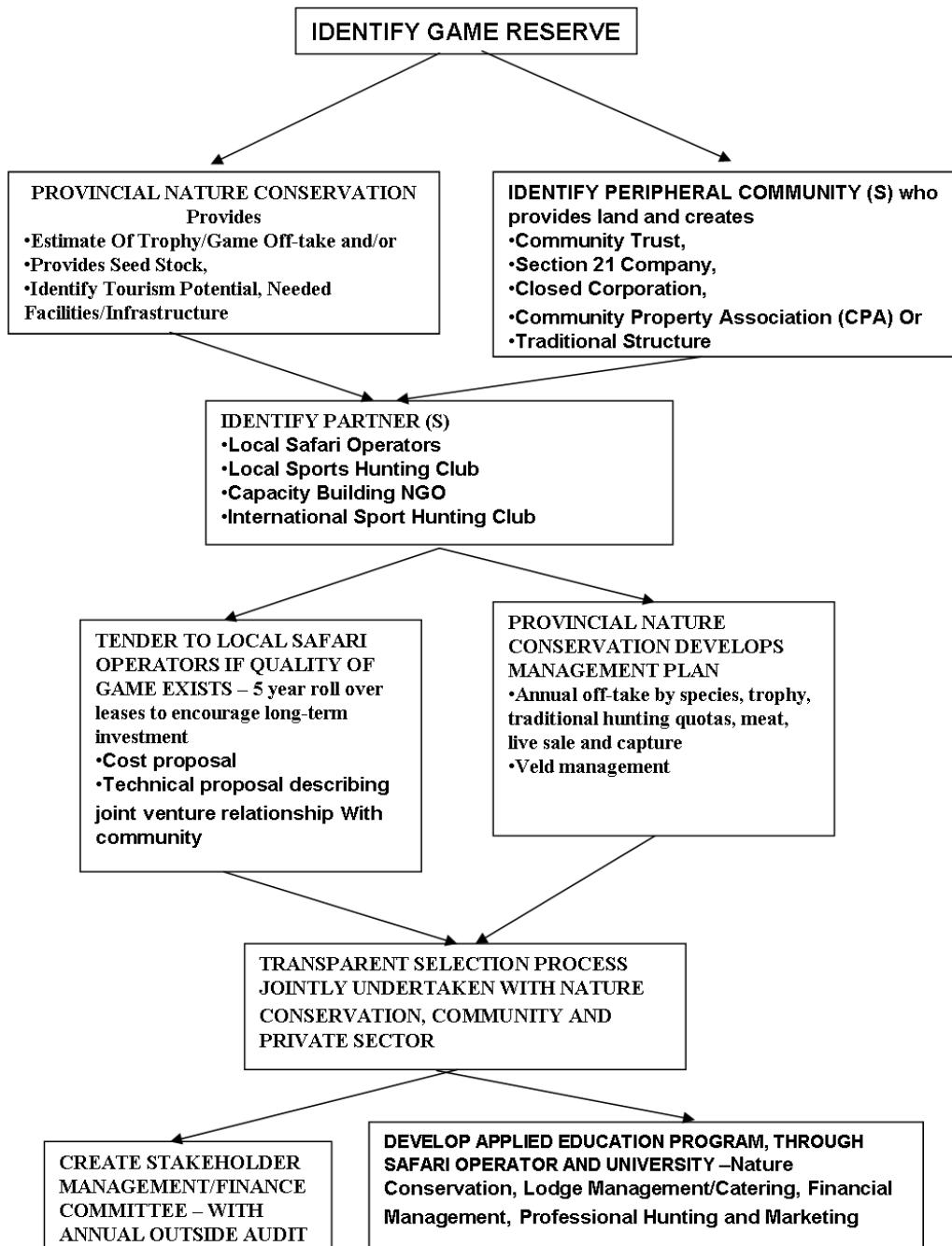
²⁹⁹ Trevor Shaw of Shaw Diamonds, P.O. Box 131, Ramsgate 4285, South Africa. Business: 27-11-484-1560, Home: 27-11-708-1969, shawdiamonds@yebo.co.za

PPCP Partnership. The public, private, community partnership (PPCP) works as follows: 1) the Hluhluwe Game Reserve provided seed stock (buffalo, nyala, impala, kudu, zebra, etc.) and a game ranch management plan, 2) the private sector provided the business plan, 3) SCI, overseas sporthunters, provided the seed money for fencing, 4) the community provided the labor to fence and 5) the community and private sector formed a closed corporation. The community insisted that this is a marriage and expect the private sector partner to be with them for the next five to ten years until they are able to stand on their own two feet, in essence to function as a mentor. The fact that the Mpembeni community will have hunttable buffalo will immediately provide them with access to the international market.

Based on this experience, the following model is emerging which may be adapted to each situation (Figure 9.7). The principal author has been unable to follow-up on this since leaving SCI as its African office manager in November 2001. However, through periodic contact with Jabulani Mbhamali and Nic Vaughn-Jones, he believes it is progressing.

The Mpembeni community is very fortunate to have a Catholic mission. Their school is well furnished, the principal, the *inkosi*'s brother, has his master's degree and the majority of the last class of school leavers passed their high school exams and earned degrees. It is believed that this may not be the norm in many of the rural schools and investment in primary and secondary education may be required, followed up by innovative on-the-job applied educational programs.

For full devolution to occur, some students must be sent off for tertiary education as described in Section, 9.8.2.3 Human capital, skills and knowledge. It is unclear how far this program has evolved as it is in its early stages of development.



Source: DeGeorges In: SCI Africa Office (2000b)

Figure 9.7: Possible public private community partnership leading to devolution, Mpembeni Community, KwaZulu-Natal, South Africa

According to De Jager (*pers. comm.*),³⁰⁰ the Mpembeni community program is going strong, with many other communities wishing to come on board. It also appears that the South Africa government is beginning to make development money available to rural communities to fence their areas, while provincial nature conservation authorities are providing wildlife “seed stock” (Collins, *pers. comm.*).³⁰¹ As with mentoring in agriculture (Chapter 5, Section 5.7.4.2, Land reform and South Africa), to be successful, a joint venture will be needed between each community and a white safari operator who will train the community and expose them to the market place so that in ten to 15 years they can begin running their own operations. The province of KwaZulu-Natal has written up “Guidelines in Community Conservation Reserves” with regard to establishing a process leading to full community empowerment and integration into the wildlife and hunting industry (De Jager, *pers. comm.*), while the Department of Environmental Affairs and Tourism of South Africa has developed similar guidelines at the national level (Collins, *pers. comm.*; DEAT, 2003). Communities are also requesting that traditional hunting with spears and dogs be legalized,

“to only see hunting with a rifle without the use of dogs as the only ethical form of hunting is a white liberal point of view” (RSA Community Organizations, 2005).

9.9 WHITE MOUNTAIN APACHES, LESSONS TO BE LEARNED FROM AMERICA FOR AFRICAN CBNRM

The following information was provided to the principal author during a visit to the White Mountain (Fort Apache) Apache Indian Reservation in June 2003 (DeGeorges, 2003b). Meetings were held with personnel of the Wildlife and Outdoor Recreation Division (W&ORD - formerly Game and Fish Department)

³⁰⁰ Stoffel De Jager, Natural Resources Trade Manager, Commercial Operations Division, Ezemvelo KZN Wildlife.

³⁰¹ Steve Collins, Transform Program, German Development Cooperation (GTZ), Hatfield, South Africa

of the White Mountain Apache Tribe: John Caid, director, David Kitcheyan, deputy director and environmental/information officer, Greg Dazen, Jesse Palmer, wildlife biologists, Chadwick Amos, field supervisor/law enforcement. This was the home of the famous Apache warrior, Geronimo. The White Mountain Apache conservation model should prove very valuable to Sub-Saharan Africa CBNRM (Figure 9.8).

The White Mountain Apache Indian Reservation was formed in 1891. It is located approximately three and a half hours northeast of Phoenix. Prior to the creation of the reservation, the White Mountain Apache roamed freely over a much larger area extending well north of the existing reservation and south into Mexico. Similar to group and cooperative ranches in Kenya, the creation of the reservation gave the White Mountain Apaches sovereignty over the land, but not their natural resources. The reservation is situated at between about 1,829 and 2,743 m (6,000-9,000 feet) above mean sea level (Mean Sea Level) and consists of alpine meadows and stands of ponderosa pine and Douglas firs. It is the key watershed that supplies water to the city of Phoenix.

“Located on 1.6 million acres (640,000 ha) of resource-rich land, the Fort Apache Reservation is known for its scenic high elevation lakes and over 500 miles (805 km) of cold streams, pristine lands and thriving wildlife – making it a popular outdoor destination area for visitors throughout Arizona and the southwestern United States” (Caid, 2000).

The Wildlife and Outdoor Recreation Division (W&ORD) has been in existence since 1978. Previously, most of its employees were white, but today they are all Apache, with the exception of the current director. The following lessons may be learned from one of the most successful indigenous people’s wildlife/resource management programs in the world.

9.9.1 Lessons to be Learned for Africa

- Communities may have to legally challenge land and resource tenure, going so far as taking the government to the highest court in the land;
- By integrating community needs into the management of wildlife, poaching can be significantly reduced;
- With proper management plans, land use plans and controls, overseas trophy hunting, traditional meat hunting and other consumptive (e.g., logging and fishing) and non-consumptive (e.g. canoeing, white-water rafting and skiing), resource use can take place within the same geographical area with no harm to high income generating trophy quality;
- “Profitability and conservation are not mutually exclusive and, in fact, can be mutually beneficial. For example, the profitability of tourism and outdoor recreation enterprises can be directly tied to the tribe’s competency in natural resource management and conservation;
- Strong institutional capacity enables tribes to exert their jurisdictional sovereignty more effectively and may even lead to new opportunities for the exercise of sovereignty;
- Tribal codes, regulations and policies gain acceptance and effectiveness when they reflect community values” (Caid, 2000);
- Minimal interference by federal and state government, other than decision support and technical backstopping, is needed;
- Conservation can help fund and subsidize other economic sectors that provide employment to community members at the household level; and
- University training of wildlife and fishery biologists and business managers is critical to achieving institutional capacity.

In the past, wildlife populations were decimated from over-hunting by tribal members and from commercial hunting by non-member white hunters, who sold the meat, skin and trophies, similar to the history of wildlife over the rest of the North American continent and over much of colonial Sub-Saharan Africa (see Chapter 3). The Merriam elk (*Cervus merriami*) was indigenous to the area but hunted to extinction by commercial hunters. Today, big game consists of re-introduced elk, Rocky Mountain Big Horn sheep (*Ovis canadensis canadensis*), pronghorn antelope (*Antilocapra americana*), mule deer (*Dama hemionus hemionus*), Coues (white-tail) deer (*Odocoileus virginianus couesi*) and black bear (*Ursus americanus*). Turkey (*Meleagris gallopavo*), javelina (*Tayassu angulatus*), cottontail rabbit (*Sylvilagus audubonii*), tree squirrel (*Sciurus* sp.), fox, coyote (*Canis lantrans*), duck, dove, pigeon and quail can also be hunted.

9.9.2 Land and Resource Ownership, Key to Success

Unlike most CBNRM programs in Africa, the White Mountain Apaches own their own land (e.g., as in Kenya) and their natural resources. In essence, they are a sovereign state (the reservation) within a state (USA). They feel that this is the key to their success. They have exclusive rights to manage their natural resources in the interests of their people, both economically and culturally. However, this has not always been the case.

As with most community programs in Africa, both state and federal governments decided how their wildlife and other resources would be used through top-down management (e.g., somewhere between “Management Against and Management for the People”). As in Africa, the White Mountain Apaches were “observers on the sidelines”, while Big Brother – state and federal government – were the players on the field. Decisions on how to use the resources were not always in the interests of the “members”, that is the tribal members living on the reservation,

often biasing access to the resource to “non-members”, mostly whites living off the reservation. Does this sound like Africa?

“Until the early 1980s, however, the Tribe had minimal management control over its abundant natural and wildlife resources. Although the Tribe had long possessed a Game and Fish Department, the Arizona Game and Fish department regulated all non-member hunting activities on tribal lands. The Tribe had little input into the State’s process of establishing non-member hunting seasons or setting harvest levels for reservation wildlife. By the 1970s, tribal managers had grown increasingly concerned that the State’s liberal issuance of big game hunting permits at below-market prices was irresponsible from a conservation standpoint. Further, the Tribe was missing out on a potentially lucrative source of income” (Caid, 2000).

Does this sound like Africa?

“Seeking to expand its jurisdictional control over its resources, the Tribe filed a lawsuit against the State of Arizona in the late 1970s. The issue ultimately found its way to the United States Supreme Court: in 1982, in a related case, *Mescalero Apache Tribe v. State of New Mexico*, the Court recognized tribes’ sovereign authority over the management of tribal fish and wildlife resources. This decision paved the way for the White Mountain Apache Tribe to institute its own management practices and to develop innovative, culturally appropriate recreation-based businesses. Building on its success in fisheries management – a program contracted from the Bureau of Indian Affairs (BIA) some years earlier – the Tribe established its wildlife management program through another contract with the BIA and focused on the development of various big and small-game hunting programs” (Caid, 2000).

As part of the agreement with the reservation, the tribes were given jurisdiction over their wildlife and fishery resources with the understanding that they be sustainably managed. Past practices of year-round hunting and no hunting quotas by species, which could negatively impact these resources, would give the State of Arizona the right to step in and re-take control. This has not happened.

9.9.3 Common Property Resources to Open Access and Back to Common Property

Similar to Africa, the White Mountain Apaches and other Apache tribes had traditional controls over the access to their resources in pre-colonial times. Wildlife was a “Common Property Resource” with controlled access by the tribal chief and elders for the good of the tribal community. Similar to Africa, at that time, human populations were low relative to the wildlife resource base. Tribal members traditionally hunted only for food. Certain species, especially the mule deer and bear, were “totems” with special spiritual significance to various clans within the White Mountain Apache tribe. Game was not hunted in the summer time, which coincides with females raising their young. Game provided both food and clothing. For instance, hunters were given five to seven deer per year to hunt for their family.

Similar to Africa, with the colonization of the USA by Europeans and the imposition of their systems of governance and management on the White Mountain Apaches, control over access to wildlife by the tribal community was taken away and placed under centralized control of the Arizona State government. What had been a “Common Property Resource” managed by the tribe to the benefit of its members became an “Open Access Resource” belonging to the general public, both tribal members and non-members (whites), managed by the state, which had little control initially over the actual management of the wildlife or, as noted at a later date, appeared to be quite liberal in its provision of quotas to non-tribal members (outsiders), often to the detriment of the game. Early on in this history, as in Africa, commercial white hunters devastated the game. The White Mountain Apaches, like many African cultures who had lived in harmony with their wildlife resources, lost complete power over controlling access.

As in Africa, access to game became a free-for-all by both members and non-members. The traditional controls, which had existed, were gone and the new controls were inadequate. As in Africa, the attitude of tribal members was, “We had better get it while we can, since if we don’t the non-members will take it”, a typical “tragedy of the commons”.

Wildlife populations were heavily pressured and some species such as the Merriam elk were wiped out. Mule deer populations were over-harvested and their populations were greatly reduced.

It was this situation that spurred the White Mountain Apaches to fight to regain access to control over the management, utilization and right to benefit from their resources. Unlike the White Mountain Apaches and other tribal groups in North America, most CBNRM programs in Africa find Africans having neither title to their land nor their resources. Most of Sub-Saharan Africa today is in a situation that the White Mountain Apaches and other tribal groups were in prior to 1982. Most CBNRM programs are top-down with strong interference by outsiders, including central or local governments, NGOs linked to Western donors and white tourism and safari operators, who make the majority of the profits from the “resources”, especially wildlife, but also timber in Sub-Saharan Africa’s tropical lowland hardwood forests (e.g., in Gabon, Cameroon, Congo Brazzaville and the DRC), fish in many of its lakes/reservoirs (e.g., Kariba, Cahora Bassa, Victoria) and even minerals (e.g. petroleum, gold, diamonds, COLTAN, etc.). Little or none of this revenue reaches rural communities who live among this incredible wealth that is being expropriated by the national/international elite, while they remain poor and backwards.

It is likely that this will continue until local communities organize themselves to fight the legal battles that will be necessary to take back their lands and resources and/or as in Burkina Faso, central government realizes that it is incapable of managing resources on its own and decentralizes power to co-manage wildlife and forests, and/or devolves ownership over these resources to communities as has happened in Southern Africa on private white-owned farms.

Under the current devolution process, the White Mountain Apaches co-exist with their wildlife. Unlike the current conservation efforts in Sub-Saharan Africa, tribal members live with the wildlife on the reservation, as opposed to being separated from it. As in pre-colonial times, the White Mountain Apaches now have control over access to wildlife by both tribal members and outsiders (non-members). Anyone is welcome to access their resources but must pay for this right under a rigid set of rules and regulations as to quotas and sex/age of the game or fish to be harvested. This is required since the White Mountain Apaches have more people on less land than historically, resulting in a resource/population ratio that is low and requires more intensive management than in pre-colonial times. Given current and projected population pressures, this is where Sub-Saharan Africa must go - where the White Mountain Apaches are today and still evolving - regain ownership over their resources and begin intensively managing them.

9.9.4 Economic Benefits

Most of the money made on the reservation is from hunting the top trophy elk in North America, about 90/year from 12 management units. The demand is so high that they can sell these hunts for US\$ 12-15,000/trophy elk, plus another US\$ 3,000 if the trophy makes it into the Boone and Crockett record book that records the top hunting trophies of all time from North America. There is a three-year

waiting period once the hunter has paid US\$ 500 as a deposit. There is also one auction hunt/year with a minimum opening bid of US\$ 25,000.

For the 2002-2004 season, 18 “management bull elk” were being sold at US\$ 5,000 each. These elk can have antlers with no more than five points/antler. One Big Horn sheep is taken per year for about US\$ 40,000. Both guided and non-guided hunts are offered for non-reservation members for antelope, non-trophy elk, bear, turkey and chance encounters with mountain lion while hunting antlerless elk.

The W&ORD generates US\$ 700,000 per year in net profits from its hunting and fishing programs. Of this, US\$ 200,000 is used to budget the W&ORD management and anti-poaching activities. The W&ORD staff finds this inadequate to drive their program. Many must use their own vehicles in their fieldwork and the staff is stretched very thin on the ground. For instance, only six staff are employed to cover anti-poaching on the 640,000 ha (1.6 million acre) reservation.

The remainder, US\$ 500,000, goes to the tribal council, which is made up of 11 members elected by the tribe, the majority of whom lack a university education and who are wary of tribal members sent out into what some call “the real world”, the “white man’s world”, and who come back to the reservation. It is likely that Project Noah students³⁰², who come from rural areas in Sub-Saharan Africa where wildlife is important, will experience similar problems in re-integrating and being accepted back into their communities on completion of their education.

As with the White Mountain Apache conservation program, the key to success will be taking Western concepts on resource management adapted to the African

³⁰² A scholarship program for rural Africans from important wildlife areas through the Department of Nature Conservation, Tshwane University of Technology, South Africa funded by Shikar Safari Club and private benefactors.

continent (e.g., university training in South Africa) and integrating them into traditional social and management systems. In Sub-Saharan Africa up until now, these Western systems have been imposed on rural people and have for the most part been rejected.

Similar to many of the CBNRM programs in Sub-Saharan Africa, one problem with the income generated from the White Mountain Apache hunting and fishing program is that there is no transparency or accountability with the US\$ 500,000 annually given to the tribal council. W&ORD staff believes that as the education of tribal members improves and more professionally trained university graduates slowly take over the tribal council from the older generation, this will be addressed. As in Africa, the lack of an annual audit opens the door for corruption and mismanagement of these funds. This has been a major problem for CBNRM programs in Sub-Saharan Africa.

As in many CBNRM programs in Sub-Saharan Africa, most tribal members on the White Mountain Apache Reservation do not even know the significance of the hunting and fishing program to their lives. There is an obvious need for a public relations program to sensitize them to this and for the tribal council to show its members how this money is used to their benefit. However, what they do know is that, within the law, they all have the right to hunt and fish for cultural and subsistence purposes.

Furthermore, if one assumes an average family size of six, this would result in US\$ 250/head of household that could be distributed from the US\$ 500,000 generated for the tribal council each year. Similar to Africa, the resource base and the potential income it can generate relative to the human population on the reservation is very low. This income will not significantly impact the livelihood of the average household and is likely best used to provide “common property

benefits” such as schools, scholarships for a university education, etc. There was no talk of household distribution of benefits.

Currently, the hunting and fishing program is the only economic sector operating at a profit. The labor-intensive timber program lost US\$ 8.9 million in 2002 and the ski and casino programs are running in the red. Thus, hunting and fishing are helping to subsidize these other programs, some of which could be restructured to make a profit, but which would be politically unacceptable, as this would mean putting many people out of work in a situation where unemployment is already high at 85%. One could argue that the self-esteem gained by being employed may be as important as making a profit for the psychological well being of both the individual and the community. In other words, hunting is subsidizing other industries that are labor intensive and which provide livelihoods at the level of households – a major shortcoming that CBNRM must overcome.

This leads the W&ORD staff, which was interviewed, and the principal author, who has analyzed CBNRM programs in Sub-Saharan Africa, to conclude that integration of tribal members and their cultural needs into the management of fish and wildlife is as important as economic benefits in obtaining a “buy-in” to conservation on the White Mountain Apache Indian Reservation. This has meant allowing tribal members to hunt, fish, log, etc., but under a set of controls that will be described below, while at the same time creating labor intensive industries, even if they are subsidized by revenue made from wildlife.

9.9.5 Education

Similar to Sub-Saharan Africa, the White Mountain Apaches were compressed onto a small piece of land compared to colonial times, the majority of former tribal land being reserved for European settlers. As in Sub-Saharan Africa, the

current population on the reservation is expanding rapidly, having grown from 8,000 to 12,000 people between 1995 and 2003 (in eight years). People are poor. Very few people on the reservation have a chance to go beyond high school. This appears to be from a combination of opportunity and a cultural stigma against those who leave the reservation to study and live in the “white man’s world”.

Recently, the first Apaches have graduated from university in natural resources management, one in fisheries and the other in wildlife biology.

The tribal council as well as W&ORD now offers scholarships to anyone wanting to study at the university level so this should help the reservation achieve a critical mass of educated people in the near future. One problem is that compared to the salaries offered off the reservation in the “real world”, salaries for university graduates on the reservation are very low, a disincentive for many to return to the reservation on completion of their studies. For instance, David Kitcheyan’s son, who is the first university trained fishery biologist from the reservation, has opted to work for the Arizona Fish and Game department where salaries are significantly higher.

9.9.6 Integration of Social and Cultural Needs into Management of Wildlife and Fish

“The W&ORD understands that community support is directly tied to the effectiveness of its work. The Division actively seeks elder involvement, largely through an elder’s advisory board, which has led to the Tribe’s list of sensitive species being even broader than those of the state or federal government. Another example is the W&ORD’s approach to managing tribal citizens’ hunting. In the late 1980s, the W&ORD established a separate harvest system for tribal citizens, which provides subsidized game tags, sets aside hunting areas on the reservation, and designates special seasons for big game hunting. Moreover, tribal member hunting fees support

the W&ORD's Conservation Fund, which in turn supports hunter education, a 'report a poacher' program and a college scholarship program for tribal members pursuing degrees in fields related to natural resource management. Clearly, these efforts to reach out to citizens and to embrace their ideas, needs and cultural connections to natural resources, not only improve program management, but also citizens' acceptance of W&ORD's activities and help ensure program success" (Caid, 2002).

As in Sub-Saharan Africa, not everyone in the tribe is a hunter. There are an estimated 3,500 tribal members who hunt and probably more who fish. It is estimated that about 200 tribal members are trophy hunters, mostly the younger generation ranging from 25-35 years of age. Tribal members have been formally integrated into the management of the game and fish on the reservation, with quotas based on seasons, management units, age and sex (Table 9.20). This is much different from most Sub-Saharan African CBNRM programs, which have tended to take an approach that "meat and money" will suffice to obtain a "buy-in" to conservation, but have ignored cultural, religious and spiritual ties to wildlife by the local community. Just as importantly, the White Mountain Apache hunting conservation model demonstrates that the best trophy elk hunting in North America can accommodate meat hunting and even some tribal member trophy hunting without adversely impacting high-paying trophy hunters from outside the area. Logging by tribal members and fishing by tribal and non-tribal members also are undertaken, indicating that a conservation area can be sustainably managed for multiple uses of its resources for both economic and cultural purposes and still produce healthy game populations including the top trophy elk in North America.

Table 9.20: Proposed WMAT 2003-2004 tribal member hunting quotas

GAME	SEASON DATES	BAG/Person	PERMIT COST U\$S	NUMBER OF PERMITS	CHANGE FROM 2002-3003
WHITETAIL DEER	Dec 6/03 – Jan 4/04	1 Buck	20	720	-15
*MULE DEER	Nov 15-Nov 30, 2003	1 Buck	20	230	-15
UNIT 8 TROPHY DEER	Dec. 13-Dec. 30, 2003	1 Buck	50	40	Same
ARCHERY DEER	Oct 10-23, 2003	1 Buck	20	50	Same
DEER FOR ELDERS, 55 YEARS OLD AND OLDER	Oct 25 – Nov 9, 2003	1 Buck	10	30	New
ELK Archery General	Oct 10-23, 2003 Oct 25-Nov 16, 2003	Cow/Calf/Spike Cow/Calf/Spike	10 10	100 800	Same No Longer Unlimited
Second Elk Junior Raghorn	CLOSED Oct 25-Nov 16, 2003	----- 1 - ≤ 4 point Bull	----- Free To Juniors	45	Same
Zone 1 Bull Elk	Nov 15-Dec 7, 2003	1 Bull	50	70	Same
Zone 2 Bull Elk	Nov 15-Nov 30, 2003	1 Bull	50	65	Same
*Zone 3B Bull	Nov 15-Dec 7, 2003	1 Bull	50	35	New Hunt
Unit 8 Bull Elk					
• Archery	Sept 10-24, 2003	1 Bull	125	15	Same
• *Rifle	Sept 25-Oct 10, 2003	1 Bull	125	15	Same
Late Cow	Dec 13-Dec 28, 2003	Cow/Calf/Spike	5	400	Same
OTHER BIG GAME					
*Pronghorn	Oct 11-19, 2003	Any Uncollared/Ear Tagged Buck	50	7	+3
*Bighorn Sheep	Oct 1-Dec 31, 2003	Any Ram	400	1	Same
Turkey	Nov 1-20, 2003	2 Turkeys	5	Unlimited	Same
Spring Gobbler	Apr 10-25, 2004	2 Gobblers (Males)	1/10 or 2/15	300	Same
Javelina	Jan 24 – Feb 22, 2003	1 Javelina	5	150	Same
PREDATORS					
Black Bear	Apr 1 – June 30, 2004 & Aug 15-Nov 15, 2004	1 Bear	5	Unlimited	Same
Mountain Lion	Jan 1 – Dec 31, 2004	1 Lion	Free	Unlimited	Same
Bobcat	Nov 1'03 – Mar 31'04	50	5 Export Tag	50	Same
Trapping	Nov 1'03 – Mar 31'04	50	5 Export Tag	50	Same
SMALL GAME					
Cottontail	Oct 25'03 – Feb 22'04	10/Day	None	None	Same
Tree Squirrels	Oct 25-Nov 23, 2003	10/Day	None	None	Same
Quail	Oct 4'03-Jan25'04	10/Day	None	None	Same
Blue Grouse	Oct 25 – Nov 23, 2003	3/Day	None	None	Same
Doves/Pigeon	According To Federal Regulations For Migratory Birds	-----	-----	-----	-----
Waterfowl (Ducks/Geese)	According To Federal Regulations For Migratory Birds	-----	-----	-----	-----

* Draw Hunt. Federal Duck Stamp and use of Non-Lead Shot for Waterfowl

Source: Jesse Palmer (2003), with permission, CAID of Wildlife & Outdoor Recreation Division (W&ORD), White Mountain Apaches (WMAT)

As in Sub-Saharan Africa, given the poverty and cultural ties to nature, multiple use appears to be the best way to manage such areas as a means of getting a “buy-

in" from society for conservation. Does the African subcontinent need parks and hunting blocks that are exclusion zones surrounded by poverty and which are rich in a multitude of resources that might help overcome this poverty? It will be observed that the four of the hunting management units for tribal members are the same as the respective non-member hunting areas. However, eight of the 12 management units are reserved exclusively for non-tribal high-paying trophy hunters. Thus, land use planning becomes integral to multiple-use management of an area. Also, of importance to the pride and dignity of the White Mountain Apaches, and relevant to Sub-Saharan Africa, is that non-tribal sport hunters are guided by Apaches, with the exception of mountain lion that is guided by whites with their packs of hounds.

No hunting license is required for small game or fishing by tribal members. Small game includes cottontail rabbit, tree squirrels, quail and dove/pigeon, blue grouse and waterfowl. Migratory game such as dove, pigeon and waterfowl require purchase of federal migratory bird stamps. Small game may be hunted reservation-wide by tribal members. Non-member hunting of small game is more closely regulated.

In negotiating the hunting season with the tribal elders, an early mule deer season has been established for people 55 years and older who traditionally did not hunt during the mule deer rut, claiming the meat is not as tasty. Tribal elders 55 and older can hunt turkey, cow and spike deer for free without a license. Key policies that demonstrate the attempt to integrate the needs of local tribal members into the management of the area include:

- Affordable costs for game shot for meat;
- High quotas in populations of game needed for meat;

- Quotas for recovered well developed populations of elk, cow and spike buck (young males) provided as both a management tool to keep the population under carrying capacity so that it continues to “breed up” and for habitat management, as well as a source of meat for tribal members;
- A special deer season as requested by elders, recognizing their traditional beliefs;
- A special quota “junior raghorn” for young hunters under the age of ten to 16 years of age;
- Diversification of hunting weapons, both archery and rifle;
- Small game hunting for free;
- Limited quotas and high trophy fees for tribal trophy hunters who are few, keeping most trophy animals for non-tribal members – white sport hunters coming from outside the reservation as a means of generating wealth for community development; and
- A limited quota by lottery “drawing” for tribal members for highly desirable trophy species.

It should be noted that a large effort is made in producing game as an important source of protein. As in Sub-Saharan Africa, the majority of tribal members are very poor, living a subsistence lifestyle. Thus, hunting provides a very important and significant portion of their diet and also allows tribal members to fulfill cultural needs.

Due to these efforts, the needs are met of the approximately 3,500 tribal members out of 12,000 who hunt. It is estimated that as a result of these efforts 95% of the game is harvested legally. Unfortunately, in Sub-Saharan Africa, very few conservation programs manage their game for both trophy hunting to gain income and meat as a source of protein to be harvested legally by traditional hunters. Most African CBNRM conservation programs allow only trophy hunting by

outsiders (rich whites from overseas), providing a limited amount of meat for the community. Since only 2-5% of the game population is harvested for trophies in Sub-Saharan Africa, another 10-25% of most game, depending on the species, could also be harvested as a source of meat and of course this is done clandestinely by traditional hunters so that management of the resource is precluded. Of course the more intensive the management, the more biological and habitat information is needed in order to assure that management decisions maintain the sustainability of both trophies and meat.

9.9.7 Poaching

The W&ORD has six members involved in anti-poaching to control the estimated 5% illegal game off-take. A “report a poacher” program exists, though the W&ORD staff says that most people will not report “their own” since the reservation is a small tight knit community and this can cause social unrest and friction. They will report “non-member” poachers. If we could get to this point in Sub-Saharan Africa, with community members being allowed to legally hunt, fish and harvest “managed resources” so they do not have to poach, *voilà*, wildlife would recover in leaps and bounds and be abundantly available for economic and cultural purposes. On the White Mountain Apache Reservation, “non-member poachers” are prosecuted civilly by the tribal justice system and fined. For illegally harvested elk, the non-member violator is charged US\$ 30,000, which is two times the trophy fee paid by non-member sport hunters. Additionally, they are turned over to the USFWS and prosecuted for a “Lacey Violation” for attempts to transfer game across international boundaries (from the reservation into the USA). This is a felony and can result in a major fine, a loss of voting rights and the right to own firearms, as well as a jail term.

For Sub-Saharan Africa, as communities take over management of wildlife areas, similar problems will exist, especially arresting or “snitching” on community members who break the law. However, what is very important based on the W&ORD program is that 95% of the poaching problem can be solved if the local community’s needs are integrated into the management of the area (both hunting and gathering) so that they can have legal but controlled access to the resources. In turn, by turning wildlife into a “Common Property Resource” which community members feel belongs to them, it will be in their interest to collaborate with both community anti-poaching teams and wildlife departments to prevent outsiders coming in to take and abuse “their” resources. The “5%” can be dealt with by government anti-poaching teams and/or creating community-based teams.

Nonetheless, the key to note here is that eliminating the “95% poaching factor” is not dependent on how powerful a police/anti-poaching force that can be manned but on rural people living with wildlife and their needs being integrated into the management of the area. To repeat once again, the White Mountain Apaches have only six people to conduct anti-poaching, an impossible task if it was illegal for all Indians to hunt and fish and everyone poached. This success can be extended to much of the USA, where “hunter hotlines” are used by game departments to help control poaching. In America, hunters and fishermen pay between 70-90% of the annual state game department operational fees. In addition, federal taxes on hunting products (Pitman Robertson Fund) and fishing gear (Dingell Johnson Fund) go to state game departments for game and fish research and habitat management, which helps not only improve game but protects endangered species and improves habitat and thus biological diversity. In Virginia, there are many areas where there is only one game warden/two counties (equivalent to two districts, provinces or prefectures in Sub-Saharan Africa), and it is the “eyes and ears of the warden”, the common citizen, who sees the game and fish laws to his benefit and it is thus in his interest to call a toll-free hunter

hotline number to warn game wardens when the “5%” break the law. Thus wildlife in America, as on the White Mountain Apache Indian Reservation, is seen as a “Common Property Resource” and it is in the interest of the country’s hunters and fishermen to stop the illegal off-take of “their” natural resources. There is no reason to think that this same process cannot work in Sub-Saharan Africa.

9.9.8 Monitoring

Wildlife monitoring is a tool to assure sustainability of game off-take. Wildlife monitoring is a key component to the success of the White Mountain Apache wildlife management program. The following monitoring takes place:

- Hunter questionnaires/report forms look at hunter success/effort, trophy quality and field observations; and
- Annual surveys look at population trends, “up, down, stable”
 - Annual aerial survey look at population trends and sex ratios in January when snowfall concentrates game;
 - Summer transect counts look at trends in recruitment and age ratios;
 - The aging of elk is determined by cimentum ring analysis of the teeth;
 - Trophy quality for elk is determined;
 - Habitat quality such as pasture/browse quality, climate, fires is assessed; and
 - Poaching is controlled.

The White Mountain Apache Reservation is broken down into a number of management units. There are no core protected areas. Similar to the Selous

Game Reserve (SGR), based on the collection of biological and other data, the entire reservation is hunted, fished and logged for its timber. Yet it consistently produces the top trophy elk in North America.

It should be noted that unlike Sub-Saharan African game, elk and deer drop their antlers every winter and then grow them back beginning in the spring. To some degree, trophy quality can vary from year to year among these cervids depending on rainfall and in return, browse and forage. In Sub-Saharan Africa, game does not shed its horns. Horns increase in length and basal diameter each year until old age when growth stops and they begin to “broom down”. Thus in a given management area in Sub-Saharan Africa, there can be a direct correlation between trophy quality and age, whereas this is more variable among North America’s cervids (deer, elk and moose). It is believed that trophy quality trends for Sub-Saharan African species may thus be a better indicator over time of successful management of game for economic and ecological purposes. A decrease in trophy quality over time for Sub-Saharan African game can be an indicator that various factors (drought, disease, unrealistic quotas, poaching, over-grazing by livestock, etc.) may be influencing game populations, enabling the wildlife manager to take mitigative action prior to an economic (poor trophies for hunters) or ecological (population crash) crisis being reached.

It is important to note that W&ORD does not try to obtain total numbers in this vast extensive area, which would have high standard deviations making establishment of precise off-take quotas based upon “total counts” alone very questionable, such as a 2% offtake of the annual population of a given species for trophy quotas. Rather, all of this biological data, as well as social inputs from the tribal members, are used to set trophy quotas for economic and social purposes and meat quotas for socio-cultural needs. Then these off-takes are monitored; this basically is “adaptive management” in full use.

9.9.9 Animal Rights and the White Mountain Apache Reservation

An animal rights group promised to pay the amount that would be lost on the reservation to stop all bear hunting. This was turned down, as wildlife and hunting are both an economic and cultural resource. This would have placed the reservation wildlife management program back under the control of non-members, something the proud people of the White Mountain Apache Reservation want to avoid as much as possible.

The Defenders of Wildlife, an animal rights group, also offered to pay for each livestock killed by the Mexican gray wolf being introduced. The problem in determining wolf kills is often difficult, since by the time the carcass is found it is often highly decomposed. The W&ORD staff is wary of all animal rights groups. African communities and governments need to take this lesson into account when considering taking “handouts” from Western NGOs and donors.

In closing, Marks (2005 *In:* Lyman & Child, 2005) may best sum up where conservation needs to go,

“people’s behavior, on all levels, is part of and shaped by wider social, economic, and political forces. Though recognizing these interdependencies, I remain convinced that the integration of environmental management, governance, and wealth must begin at the village level, where local people merge ideas and behavior into sustainable livelihoods. Such local processes must become the basis upon which incentives, policies, and management programs are designed and implemented for real community-focused conservation to materialize”.

This comes down to governments letting go of control over land and resource tenure, thereby empowering local communities to take back these resources and integrate their socio-cultural values into them and thus to gain concurrent benefits.

9.10 CONCLUSIONS

Community-Based Natural Resources Management (CBNRM) is a very emotive subject, with pros and cons being debated within and between the sustainable use and animal rights movements. Most programs have tended to be driven by NGOs and Western donors, though the original Sub-Saharan African program, CAMPFIRE, was designed by Zimbabweans to address the inadequacy of centralized management over the illegal off-take of wildlife by alienated rural Africans. It was, however, eventually hijacked by the U.S. government and prevented to date from achieving full devolution (ownership of land and wildlife by rural communities) due to the political turmoil of radical land reform beginning in 2000.

CBNRM is a dynamic process, which has the ultimate goal of leading to the devolution and empowerment of rural communities to take back their natural resources and receive direct economic and cultural benefits from their sustainable management. Most CBNRM programs tend to still be too top-down, with too much outside interference by governments, which are reluctant to devolve final ownership and control over these resources to communal management institutions. The government and other middlemen (tourist and safari operators and NGOs) have often placed themselves in between the rural communities and their resources, making it difficult for communities to significantly benefit from sustainable off-takes. CBNRM is said to be outside the park estate, but we are already seeing communities such as the Makuleke of South Africa taking back portions of the Kruger National Park. It is likely, over the next few years that significant portions of Kruger will return, through land claims to rural communities. There is no reason why many hunting areas and some parks should not be restored to their rightful owners, the peripheral communities, initially with heavy state and private sector support off which the community can be weaned as

it develops experience and self-assurance in its ability to sustainably manage and market the resources in these areas.

Most communities also have inadequate numbers of university trained youth in such diverse fields as wildlife management, business, accounting and marketing to be able to both manage and market their resources, as well as manage the somewhat institutionally complex structures (e.g., trusts, Section 21 companies, etc.) imposed on them by the NGOs and donors. Likewise, because most communities are illiterate and have little idea as to the value of wildlife and other resources, they are often taken advantage of by governments and the private sector, being given an inequitable share of the profits gained from marketing their resources. Developing linkages to the market place is one of the biggest constraints to communities becoming autonomous over their wildlife resources.

Until the issue of tertiary education is addressed, these other stakeholders will continue to interfere in the running of communal institutions and the management of their resources. Ultimately, the goal for rural communities should be maintaining the ecological integrity of key natural areas that have a comparative advantage as a land use both ecologically and economically, while creating community-owned companies so that the majority of the net profits stay in the rural areas serving as both a catalyst for development and to educate rural youth (e.g., major scholarship program for university and technical training) to compete in a global society. This will take pressures off the overly pressurized rural resource base, as most will move to urban centers. This is a major obstacle to success.

As noted, CBNRM institutions tend to be designed by outsiders and imposed on communities. Although many atrocities were committed in the New World by the *conquistadors*, the one wise, but terrible move they made in conquering the indigenous people of the Americas was to raze the temples of the Mayans, Aztecs

and Incas. However, they left the temple foundations on which they built their cathedrals so that the local people had something they could relate to in the adoption of Catholicism and this new culture imposed on them. If you visit the cathedral in Mexico City today, you will see at the base, carved stones of Aztec origin - that of a former pyramid that stood at this site.

For instance, as is evident from the case study of the Dozo hunters of Burkina Faso, the hunting guilds are still there. The community has chosen them to manage the game reserve with oversight by the greater community. This is an existing institution dating back 100s of years to the Empire of Mali that was weakened by colonialization and the last 40 years of independence. Such guilds and other indigenous institutions existing across the continent have been ignored, as Western controlled donor money prefers to create institutions “pleasing to their eyes”. Where such traditional institutions exist in Africa, we need to take advantage of them. We do not need to try and create another failed institution based on our Western ideals. We do not need to tear the temple down to the bedrock and start all over. Colonialism, though unwillingly, left behind a foundation for this “cathedral of conservation”, in this case the hunting guilds or other traditional structures that are accepted by communities. We need to build on existing institutions such as hunting guilds or the *n!ore kxausi* resource managers/structure of the Bushmen and re-empower them to take control of managing a resource – wildlife and other resources - on which their entire psychic is based. The majority of rural Africans also depend on wildlife for survival at both subsistence and economic levels. In the case of wildlife, hunters are the best conservationists in America and Europe and the authors believe given half a chance, along with empowerment and education, African traditional hunters will fulfill a similar role.

On the other hand, the human population pressures are so great today in much of rural Sub-Saharan Africa that the extensive management systems of the past (e.g., hunting guilds, controlling access through elders or *chef de terre*, taboos, totems, transhumance, etc.) need to be integrated into more intensive management systems (e.g., wildlife and trophy quality monitoring, fire management, anti-poaching, estimates of vegetational carrying capacity and off-takes, borehole management, etc.). This is why we need some youth from the rural communities trained up in our Western management systems and then planted back into their communities to integrate the old and the new, thereby getting the best of both worlds. But we do not need to scratch out all of the past; some of the past systems and institutions have merit, if for no other reason than providing a continuum in social identity among the local people and for that alone they need to be the foundation from which we build a modern conservation ethic.

We must all be honest with ourselves that even if we could triple or quadruple income going to communities, the amount at the level of households or individuals is so low that there is just no way that “meat and money” alone will change rural Africans’ attitudes towards their natural resources.

The fact is that minority pastoralists (e.g., the Maasai) and hunter-gatherers (e.g., the Bushmen and Pygmies) live in specific geographical areas where wildlife, among other important resources, is found, which in reality is no different from American Indians living on a reservation. The fact is that in many cases, the governments have and are taking actions detrimental to their well being such as making them sedentary through group ranches in Kenya, as is the case with the Maasai, or forcing them to leave their traditional territories that are consequently turned into parks and protected areas, such as the Bushmen being forced to leave the Central Kalahari Game Reserve (CKGR) (see Chapter 3, Section 3.9.2, Eco-Genocide and the San of the Central Kalahari Game Reserve (CKGR), Botswana)

or the Pygmies losing access to 70% of their forests declared as parks and safari hunting areas in Southeastern Cameroon (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the Dobi Dobi, More Parks and Protected Areas). The areas they are left with are too small to support them carrying out traditional livelihoods while using extensive approaches to manage their natural resources. In the 21st century, this, along with population increases, will condemn the majority to abandon these traditional lifestyles. CBNRM may permit a small percentage to continue living in these rural areas, but even they will be required to more intensively manage their resources in order to support more people in smaller areas.

This tells us that conservation on its own is doomed to failure. While wildlife may be a crucial component of rural livelihoods, diversification into other activities, such as logging, handcrafts, mining, etc., will be critical, as with any developed society. Realistically speaking, some current wildlife areas may give way to critical food production. We are not going to save it all. Areas critical to wildlife need to be identified and compared to see how they will compete with other land uses. Furthermore, these activities must fit into a larger land use and development plan nationally, regionally and continentally, if the rural people and their wildlife are to have a reasonable future. As we can see from decreasing fallow (Chapter 5) and the disappearance of transhumance (Chapters 5 and 6) on the continent, the limited benefits/household from CBNRM should send up a “*RED FLAG*”. There are too many people out there, the resources are being mined, habitat is disappearing and CBNRM is only part of the solution, not “the solution”. In essence, CBNRM needs to be demystified and depoliticized to the general public interested in solutions to African conservation and development.

Like it or not, conservationists are going to have to stop being so narrowly focused. They are going to have to open up and reach out to other disciplines and realize that what they are doing must fit into a larger picture of “pre-industrial

societies”, as President Yoweri Kaguta Museveni (1997) calls them, becoming urbanized and industrialized to take the pressure off the rural resource base. Sub-Saharan Africa has exceeded the carrying capacity of the resource base to support the majority of the people living subsistence life styles. This means that the West and/or South Africa should provide the rest of Sub-Saharan Africa with the technologies to transform its raw products in Africa as a means of obtaining added value and employment; products should not be exported in the raw and transformed in U.S., China, India, Japan or Europe. It also means that the leaders of Sub-Saharan Africa should close their Swiss Bank accounts and invest profits from these resources back into their countries and their people. It means that these resources should be given back to the communities who live among them. It means that more of the profits should go directly to the producer communities so that money can exchange hands many times, creating a five to seven times knock-on effect on the economy as they turn from subsistence to consumer societies that stimulate the demand for more manufactured products, many of which can be produced on the continent. It means that there should be a major emphasis on education, preparing the majority of today’s rural youth to compete in a global society in urban centers, while teaching those who choose and/or are able to make a livelihood in a rural setting about intensive management of soils (e.g., use of fertilizers, pesticides, green manure, nitrogen fixing legumes, crop rotation, GMOs, etc.), of water (e.g. borehole management), of forests and of wildlife. In some cases, this means relearning lost traditional knowledge from the elders and integrating it into modern management principles. Wake up Africa! If you were the “United States of Africa” you would be the richest country in the world, but as individual countries and mismanaged corrupt economies, often with non-representative governments, you are among the poorest even though you may have the richest resource base in the world. Africa, only you can turn it around. The world will follow your leadership, but you must take the first step.

One thing that we can learn from the White Mountain Apaches in the USA is that the integration of spiritual and cultural needs of rural Africans into the management of their resources is just as important as monetary benefits from wildlife. Integrating traditional hunters and other resource users into the formal management of their natural resources so they will not have to poach is critical. On the White Mountain Reservation, 95% of the wildlife is harvested legally, since no one has to poach, while in Sub-Saharan Africa, 95% of the wildlife is poached since few people in rural areas have legal access to wildlife let alone other resources. Like the White Mountain Apaches, many rural minorities in Africa may have to take their government to court over ownership rights to wildlife. The fight of rural people for their resources will increase in the 21st century. Certainly, creating more Sherwood Forests that alienate Africans and compress them into smaller and smaller unsustainable areas is not going to save Sub-Saharan Africa's natural resource base. Like the translocation of elephants from over-populated areas to avoid culling, parks and protected areas provide a short-term solution, which will be engulfed by a wave of human poverty. Addressing these human issues, especially working with Africans to live with and sustainable manage their natural resources as the White Mountain Apaches are doing, will be the only way to solve conservation and biodiversity issues in the long-run: taking a step backwards in re-empowerment to go forwards.

Finally, the creation of an urbanized middleclass, once people have been removed from living a survival mode, will enable Sub-Saharan Africans to start developing a modern conservation ethic that meets both rural and urban needs. Like it or not, in 50 years, this is where the majority of Africans will live. If this process of urbanization and industrialization fails, the subcontinent, its people and their natural resources are heading down a slippery slope, from which they will not return, an Armageddon where anarchy reigns and basic necessities such as food and water are fought over as diamonds, gold and oil are today.

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Chapter 10

10.0 CITES AND THE ESA, NEO-COLONIAL IMPACTS ON SUB-SAHARAN AFRICAN CONSERVATION

“The powerful members of CITES are the very same nation states that systematically discriminated against the encapsulated indigenous populations, and they continue to appropriate indigenous property according to remnant imperial doctrines held at law” (Langton, 2003 *In: Adams & Mulligan, 2003*).

“*Homo sapiens* has become the most dominant species on Earth. Unfortunately, our impact is devastating and if we continue to destroy the environment as we do today, half the world’s species will be extinct early in the next century...biological diversity is in the midst of its 6th great crisis, this time precipitated entirely by man...And we, *Homo sapiens*, may also be among the living dead” (Leakey & Lewin 1995).

The next four chapters of this book show how international neo-colonial policies by former European colonizers and the West in general are still at the heart of negatively impacting Sub-Saharan Africa’s economies and the conservation of natural resources.

This chapter discusses the Convention on International Trade in Endangered Species (CITES) and the U.S Endangered Species Act (ESA), demonstrating how they have become tools of control rather than cooperation by the West towards Africa, with negative consequences for conservation and rural livelihoods.

The authors would like to thank John Jackson of Conservation Force³⁰³ for much of the background information and critique.

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10.1 THE CONVENTION FOR THE PRESERVATION OF ANIMALS, BIRDS AND FISH IN AFRICA

Once the scramble for Africa was over, it belonged to everyone but indigenous Africans. Much of the wildlife, particularly elephant (*Loxodonta africana*), was depleted by the end of the 1900s (Bonner, 1993) (Table 10.1):

Table 10.1: African elephant populations early 1900s

COUNTRY	YEAR	NUMBER	SOURCE
Zimbabwe	1900	LESS THAN 4,000	Cumming, <i>pers. comm.</i>
Namibia	1900	300	Lindique (1995)
South Africa	1920s	120	Hall-Martin, <i>pers. comm.</i>

Source: DeGeorges In: African Advisory Board (2000).

As described in Chapter 3, the colonial masters of England, France, Belgium, Portugal and Spain in 1900 signed the first international conservation treaty, The Convention for the Preservation of Animals, Birds and Fish in Africa to save African wildlife for the exclusive use for hunting by royalty and upper class Europeans and for ivory. It prohibited shooting infants, females when accompanied by young and elephants with tusks less than 5 kg (11 pounds) each, with the goal of maintaining large enough numbers to continually meet the demand of the ivory trade. Its objective was also to protect elephant and wildlife in general from the Africans (Bonner, 1993).

Lion, leopard and wild dog were considered vermin. Leopard was taken off the vermin list in Kenya about 1930, since white settler farmers found that it kept down crop raiding baboons and bush pig populations. The hunting license system favored whites over Africans, since over much of the subcontinent, Africans could neither afford a license, nor were allowed to own a rifle (Bonner, 1993),

1949

while their traditional methods of hunting were outlawed, as described in Chapter 3.

As also described in Chapter 3, the belief was that if the Europeans had not brought their conservation laws to the African continent, all game would have disappeared. They were saving Africa from the Africans even though it was the Europeans with their firepower, modern medicine and pathetic environmental policies (e.g. confiscation of land for parks, game reserves and settler farms compressing Africans onto unviable and often marginal land masses) that resulted in the slaughter of wildlife for ivory, hide and meat and the loss of habitat across the continent. The concept of integrating traditional hunters and other resource users into the management of wildlife was not yet thought of. Africans were forced to access wildlife clandestinely, while wildlife and other natural resources became open access, not managed very well if at all by either ever expanding communities or central governments.

10.2 AFRICAN INDEPENDENCE AND POACHING

As described in Chapter 3 of this book, with the independence of the African states beginning around 1960, the continuation of colonial laws and animal conservation infrastructure failed to any longer control poaching. Almost simultaneously, an overseas market opened up for elephant ivory and rhino horn in the oil rich Middle East and the rapidly industrializing East, resulting in increased buying power for its citizens.

Raw ivory went from US\$ 5.50/kg (2.50/pound) in 1970 to US\$ 132/kg (US\$ 60/pound) by the end of the decade. This resulted in an escalation in poaching. Kenya's elephant population fell from an estimated 167,000 to 59,000 between 1973 and 1977 (Bonner 1993). Leakey and Lewin (1995) place Kenya's elephant

1950

population at less than 20,000 by 1989. Even though the ivory trade was legal in Kenya, it is estimated that between 10,000 and 25,000 elephant/year were killed illegally. Under pressure from the World Bank, which was providing money for tourism, hunting was banned in 1977 and the sale of wildlife products was banned in 1978, neither of which stemmed the poaching of wildlife. In fact, many authorities believe that by taking safari operators, who had been collaborating with the game department to control poaching, out of the bush, elephants were opened up to even more indiscriminate slaughter. "If you leave your house empty, you can expect thieves to move in" (Bonner, 1993). President Jomo Kenyatta's wife, Mama Ngina, was the key figure behind Kenya's elephant poaching and ivory trafficking (Bonner, 1993). Parker (*pers. comm.*; 2004) says that there was never any hard evidence to support the claim of Mama Ngina's involvement. However, Kenyatta's daughter, Margaret, ex-mayor of Nairobi and sometime Kenyan representative to the United Nations Environmental Program (UNEP) was heavily involved in ivory dealings. Her company, the United African Corporation (UAC), exported a lot of ivory to China during the 1970s, with an estimate that in 1974 alone she could have exported as much as 73 tons of ivory representing over 3,000 elephants (Parker, 2004).

Uganda's elephant population under Idi Amin was virtually eliminated, while Tanzania lost 75% of its elephants between 1979 and 1989 (Leakey & Lewin, 1995). In the Selous Game Reserve (SGR), with the highest elephant population in Tanzania, elephant populations fell from 110,000 in the late 1970s to 55,000 by 1986 to as low as 30,000 in 1989 (Siege, 2000; Baldus, 2005 *In:* Baldus, 2005).

"Village poachers and game scouts did the shooting, but 'big people' - politicians, civil servants, business men and even hunting operators - masterminded the slaughter.³⁰⁴ This book is not the place in which to reveal the details and names, some of which are

³⁰⁴ Also known as *bwana mkubwa* (the "big people") (Baldus, 2005).

known, as many of these people are still alive" (Baldus, 2005 *In: Baldus, 2005*).

Due to the nation-wide anti-poaching³⁰⁵ operation called *Uhai* (life) (Baldus, 2005 *In: Baldus, 2005*), along with the development of the GTZ-backed Selous Conservation Program (SCP), by 2000, the elephant population of the Selous had returned to about 60,000 elephants due to natural population growth and behavioral changes, making them easier to count in the open (Siege, 2000). Tanzania's national elephant population declined from a high of 365,000 in 1977 to an estimated 53,000 by 1993, due to both poaching and a major reduction in range from 90% of the country to 50% through ever-growing human populations (GOT, 1993).

The International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU) African Elephant and Rhino Specialist Group reports that Africa's elephant populations dropped from just over 1,000,000 in 1981 to 700,000 by the late 1980s. They reported, "there can be no doubt, it is the (illegal) ivory trade that is reducing the population of the species most severely" (Bonner, 1993). While the principal author was living in Senegal, elephant poaching was so bad in the Central African Republic that trophy hunting for this species was closed in the mid-1980s. Leakey and Lewin (1995) place the drop in African elephants from 1.3 million to 625,000 between 1980 and 1989. They argue that what people failed to realize was that the sex ratios were being modified, as selective harvesting of mature males for their larger tusks skewed the 50% male/female ratios, males dropping to 22% of adults in Kenya and to less than 1% of adults in Tanzania. This disrupted mating patterns, greatly decreasing the likelihood of a fertile female (two to three days every three months) encountering a male at the right time. Once the big males were dispatched,

³⁰⁵ Most of the elephant poaching in the Selous had been stemmed by 1990 (Baldus, 2005 *In: Baldus, 2005*).

females were poached with the average tusk size dropping from 25 to 12 pounds. Many elephant herds began losing matriarchs, who pass on knowledge and provide social organizational structure to the herd.

While Ian Parker's 1979 ivory trade study indicated a population of 1.3 million elephants, ivory exports from 1976-1978 represented less than 5% of all African elephants, which in theory would be sustainable if Africa's elephant populations were stable, which they were not (Parker, 2004).

What no one wanted to deal with is that government corruption and lack of good governance, not trade were behind the uncontrolled poaching of elephant, something that CITES on its own could not resolve (Bonner, 1993). In many cases, this was still the case in 2002.

Meanwhile in Southern Africa, elephant numbers were on the increase (Leakey & Lewin, 1995).

10.3 CITES

The Convention for the Preservation of Animals, Birds and Fish in Africa of 1900 was the basis for most of the colonial wildlife legislation in Africa and a forerunner of "The Convention on International Trade in Endangered Species (CITES)" of 1973. CITES brings states together to control the trade that may endanger species of animals and plants. Animals covered by CITES are classified into three categories (CITES, 2005a):

- **Appendix I.** Species that are threatened with extinction, which may be affected by trade (endangered by trade). They cannot be traded, with the

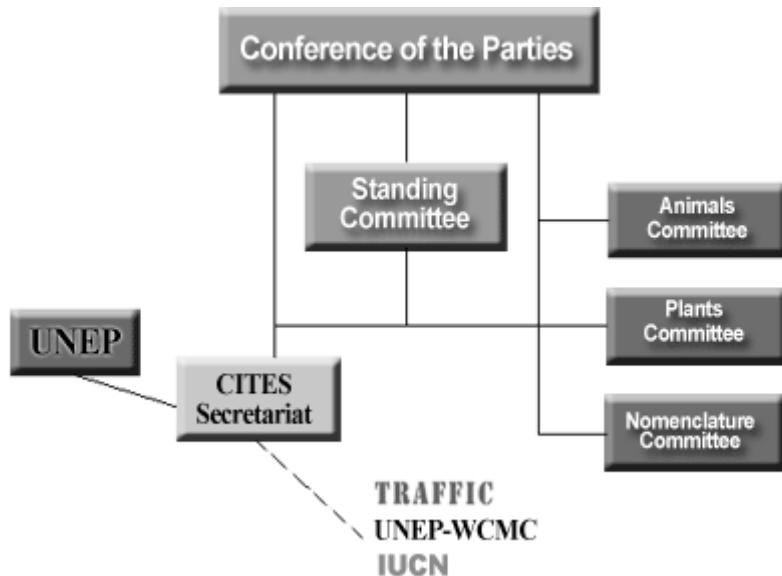
exception of hunting trophies under permit, hunting being considered non-commercial trade, which requires export documentation.

- **Appendix II.** Species which although not necessarily now threatened with extinction may become so unless trade in specimens of these species is subject to strict regulation in order to avoid utilization incompatible with their survival.
- **Appendix III.** All species which any party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and as needing the cooperation of other parties in the control of trade. Any country can request a listing of its own species that allows relatively free-trade.

Classifications of species by “appendix” can be found in various databases linked to CITES (CITES, 2005b; UNEP-WCMC, 2005a). The classification of species is supposed to be based on sound science, but more often than not, it is based on eco-politics. The CITES conferences are intense media events with NGOs on both sides of the fence, sustainable use as opposed to animal rights, lobbying to assert their ideologies and impose their organizational interests on the parties. Many of the parties (member countries) come with pre-determined positions. According to Parker (2004), CITES failed to recognize that the 1933 Brussels Convention on African Conservation had already introduced hunting/trade categories: Class A of species that could not be hunted or traded and Class B for species that could only be hunted and traded on permits. Yet, animals continued declining.

CITES is organized as follows (Figure 10.1).

1954



Source: CITES (2006) with permission, CITES.

Figure 10.1: Organization of CITES

The CITES secretariat is administered by the United Nations Environmental Program (UNEP) and is based in Geneva, Switzerland. It plays a coordinating and advisory role to the signatory states (countries) to the convention called “parties” collectively referred to as the “Conference of Parties (COP)”, who meet every two years to determine the classification of trade in species globally.

“The Standing Committee provides policy guidance to the Secretariat concerning the implementation of the Convention and oversees the management of the Secretariat's budget. Beyond these key roles, it coordinates and oversees, where required, the work of other committees and working groups; carries out tasks given to it by the Conference of the Parties; and drafts resolutions for consideration by the Conference of the Parties” (CITES, 2005c).

The Animal and Plants Committees of experts were established

“to fill gaps in biological and other specialized knowledge regarding species of animals and plants that are (or might become) subject to CITES trade controls. Their role is to provide technical support to decision-making about these species” (CITES, 2005d).

The Nomenclature Committee provides advice on scientific names. The United Nations Environmental Program's World Conservation Monitoring Center (UNEP-WCMC), on behalf of the CITES secretariat, manages the CITES Trade Database that monitors the trade in CITES-listed wildlife and plants, providing the secretariat with annual reports. Additionally, annual reports from the scientific authority of each country (party) are provided to the secretariat and are used by the scientific authority of each of the member countries to detect problem areas and take remedial steps (DEAT, 2004a). Affiliated with the International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU) and the Worldwide Fund For Nature (WWF), a joint wildlife trade-monitoring program, the Trade Records Analysis of Flora and Fauna in International Commerce (TRAFFIC), with offices in about 20 countries. TRAFFIC has a memorandum of understanding to build capacity at regional and sub-regional levels to implement and enforce CITES (CITES-TRAFFIC, 1999)

At national levels, each signatory country/member state “party” has a CITES management authority and a CITES scientific authority, normally within a ministry that deals with overall conservation issues. For instance in South Africa, they are housed within the Department of Environmental Affairs and Tourism. In the USA, they are housed within the U.S. Fish and Wildlife Service (USFWS). First, the scientific authority determines if the science behind the recommended trade for a given species is sound, that is “non-detrimental” to the species. This implies that the exportation or importation of a species from a given country will “not impact negatively on the survival of that species in the wild” (CITES, 2005a). A “non-detrimental finding” is necessary before the exportation or importation of a species.

Once the scientific authority issues a “non-detrimental finding”, the management authority authorizes

“the export of a specimen of a species included in Appendix I or II, the export of a specimen of a species included in Appendix III from the State that included the species therein, or the import of a specimen of a species included in Appendix I” (CITES, 2005a).

TRAFFIC believes that the illegal trade in wildlife is second in value only to drugs, with an estimated value of US\$ 20-25 billion/year (Duffy, 2000). In theory, the question should not be how to stop the trade, but how to control it so that the harvest of wild resources is both sustainable and makes an important contribution to the economies of developing countries. However, Western biases prevent this from happening. Duffy (2000) feels that pro-trade parties have been relatively isolated and compromised at CITES.

10.3.1 CITES a Western Control Mechanism over Africa’s Natural Resources and Development

An NGO (Non-Governmental Organization) technically qualified in protection, conservation, or management of wild fauna and flora may apply for observer status. Observers at a COP may attend all plenary and committee sessions, comment in the sessions, but are not permitted to vote on proposals (USFWS, 2003). Their main influence on CITES decisions is through lobbying.

CITES has become a “tool” for Western governments and NGOs, especially the animal rights movement such as the Humane Society of the United States (HSUS),³⁰⁶ Environmental Investigation Agency (EIA),³⁰⁷ International Fund for Animal Welfare (IFAW)³⁰⁸, People for the Ethical Treatment of Animals (PETA)³⁰⁹, to control how Africa and the developing world use their wildlife. It

³⁰⁶ The Humane Society of the United States (HSUS), 2100 L Street, NW, Washington, D.C. 20037, USA Tel: 202-452-1100. <http://www.hsus.org/>

³⁰⁷ Environmental Investigation Agency (EIA) UK, 62/63 Upper Street, London N1 0NY, United Kingdom, Tel: +44 (0)20 7354 7960, Fax: +44 (0)20 7354 7961. ukinfo@eia-international.org, <http://www.eia-international.org/>.

³⁰⁸ International Fund for Animal Welfare (IFAW), PO Box 193 • 411 Main Street Yarmouth Port, MA, 02675, USA. <http://www.ifaw.org/ifaw/general/default.aspx>.

³⁰⁹ People For The Ethical Treatment of Animals, 501 Front Street, Norfolk, Virginia 235210, Tel: 757-622-PETA, <http://www.peta.org/>

assumes that regulations controlling trade can help prevent species from becoming extinct. In the case of the animal rights movement, the hope is to use CITES to stop all trade in wildlife, as philosophically they see this as immoral. Of course, they have little or no understanding of the impacts on the ground to wildlife when it has no value.

CITES largely ignores socio-cultural and economic constraints (Duffy, 2000), which in the third world may be more crucial to the survival of wildlife than bureaucratic sanctions. Lancaster University political scientist, Rosaleen Duffy (2000), believes that CITES has evolved from a regulatory regime to control trade to a prohibition regime. She believes that industrialized states (the West) and the East African States (whose decision-makers have been bought off by Western governments and NGOs, in particular Kenya and Uganda) favor preservationist methods and thus trade bans, while much of Southern Africa favors "sustainable use" as a conservation policy, believing that unless wildlife has value, its habitat will be replaced by other land uses. She believes that in the case of most international agreements, norms based on Western political ideologies dominate, such as the "precautionary principle" (see Chapter 9, Section 9.2.1, Precautionary Principle; Studying Wildlife to Extinction), and are often reinforced by the Western donors and NGOs with threats of foreign aid cuts and tourism boycotts if African/other countries refuse to comply. Countries like Kenya and Uganda end up having "donor-dependent conservation policies" (Duffy, 2000) that are a disincentive to good conservation on the ground by landholders who are forced out of conservation into other land uses, with wildlife having little or no value.

10.3.2 CITES Fails to Serve Africa

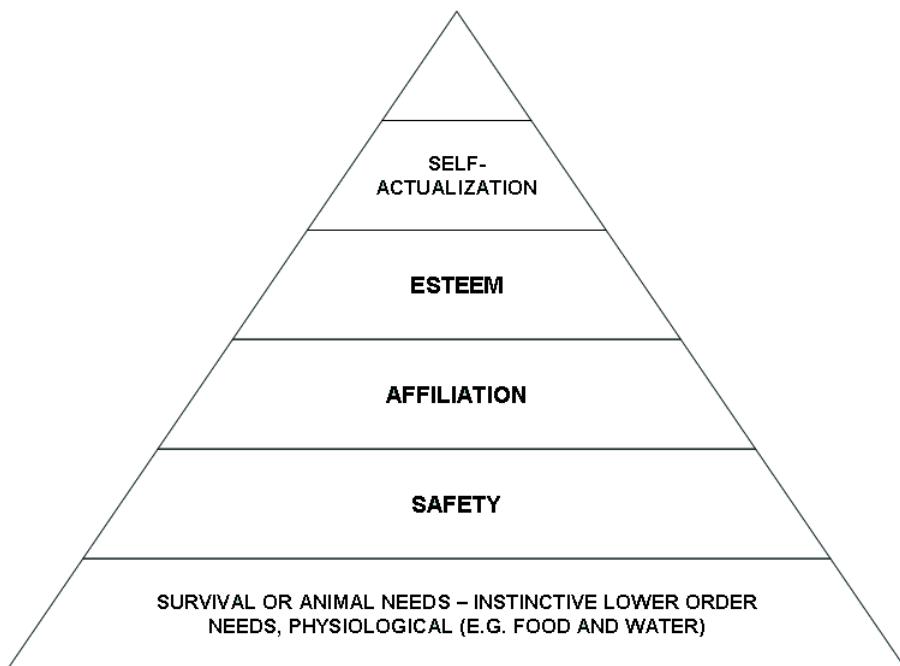
This form of neo-colonialism, which subverts the sovereignty, independence and right to economic development of emerging democracies, assumes that

regulations controlling trade can help prevent species from becoming extinct. A study by Roe, Mulliken, Milledge, Mremi, Mosha and Grieg-Gran (2002 *In: LWAG/DFID, 2002*) indicates that actions by CITES have often reduced income to rural communities without any obvious conservation benefits. They recommend that the “CITES community” be sensitized to the issue of rural livelihoods linked to the trade in endangered species and the implications on these livelihoods by their actions.

CITES ignores many of the real current causes of elephant/wildlife depletion which cannot be addressed through trade control, but must be dealt with on the ground and are integrally linked: 1) poverty, 2) failed centralized management systems, 3) inappropriate governance, 4) corruption at all levels of society, 5) lack of perceived control by rural communities over access to “their” wildlife (e.g., land and resource tenure), 6) alienation by rural communities towards parks and protected areas, which they perceive as having been confiscated from their ancestors 7) inadequate benefits (economic and cultural) to rural communities from elephant and other wildlife, 8) human and livestock populations that have increased an up to 6.5 times during the 20th century (see Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY) displacing wildlife and leading to, 9) land hunger and resulting habitat loss, 10) failure to urbanize and industrialize at a rate that can take significant pressure off rural areas and their natural resources by offering alternative lifestyles and 11) the illegal bushmeat trade, which could be sustainably managed if legalized, to fill the demand of rapidly growing urban populations in Sub-Saharan Africa.

Thomson (2003) considers the above “proximate causes”. Although the authors whole heartedly agree with his premise, they believe the definition of ultimate/proximate used by Thomson should be reversed, “ultimate” being

poverty, etc. and “proximate” being illegal trade and the black market (See Diamond’s use of these terms, Chapter 13, Section 13.8.6.7, Ultimate and proximate causes of Rwanda genocide). CITES deals only with “proximate causes”, the illegal trade and the black market, which would become irrelevant if the above ultimate causes were addressed. Without addressing these ultimate causes, the proximate causes for the illegal trade in ivory, horn and bushmeat will never disappear. Thomson (2003) believes that the majority of rural Africans, due to the population explosion in the 20th century, are at or near the lowest level of Maslow’s hierarchy of human needs (Figure 10.2), “survival”, and thus are prepared to do anything in order to survive. This survival mode can also be linked to Western policies towards Sub-Saharan Africa, its resources and economies (see Chapters 11-13).



Source: Redrawn from Thomson (2003), with permission, Thomson.

Figure 10.2: Maslow's hierarchy of human needs

Thus, because of these proximate causes, CITES has little impact on what is happening on the ground and unless they are dealt with, both wildlife and their critical habitat are threatened by a wave of poverty already closing in and ready to

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invade Sub-Saharan Africa's parks and reserves in the 21st century in search of Sub-Saharan Africa's last uninhabited lands, even if they are marginal for agriculture. One might ask,

"Is what we are seeing in Zimbabwe purely political, or is a large part behavioral: people cooped up in over-crowded communal areas that can no longer provide them with sustainable livelihoods, desperately trying to survive, seeing no value in wildlife, other than as a short-term resource or having been alienated from wildlife as a result of colonialism, invading 'uninhabited parks and conservancies' and ridding the area of wildlife in favor of agriculture and livestock, which they know will allow them to feed their families?" (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife and Chapter 11, Section 11.10.6, Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers).

Unless there are major changes both within Sub-Saharan African countries and between Sub-Saharan Africa and the West, is Zimbabwe where the rest of Sub-Saharan Africa is heading regardless of the politics? Certainly CITES as a conservation tool does not help the matter by tending to take away the legal value of wildlife!

10.3.2.1 Elephant poaching Mali

"Mali's elephant massacre is the result of slaughter perpetrated in the 1970s by northern Muslims against southern animists and the resulting weakened government. Armed Muslim parties shot all the opposition they could find. In the process, they shot all the wild animals to prevent their enemies from finding game for sustenance. So in addition to the death of one million people, we must add the destruction of 2,000 elephants not to mention those living in neighboring countries in the Central African Republic and Zaire. These killings were done with AK-47's. For every animal confirmed dead, one wonders how many other were wounded and died in the jungles depths...Poachers operated in gangs of 80 to 100 organized Mali and Libyan men, mainly reckless adventurers. The bosses were Libyans. They were sometimes able to penetrate 150 to 200 mi (389-518 km) into Mali" (Tré-Hardy, 1997).

The 1989 CITES elephant ban was supposed to stop this type of activity. The fact is that for the reasons stated above, CITES will not solve Sub-Saharan Africa's conservation problems and in many instances exacerbates them.

10.3.2.2 CITES and the ESA will not save wildlife in RCA's savanna areas. Wildlife in a crisis; the safari industry cries out but no one listens

Like Cameroon, the Central African Republic (CAR/RCA) has both savanna and forest habitat. Most of Africa's Lord Derby eland population (15,000) lives in the savannas of CAR. The CAR forest area in the southwest, Dzanga-Sangha, is part of the new tri-national park linked to the Nouabalé-Ndoki Park in Congo Brazzaville and the Lake Lobéké National Park in Cameroon. Wildlife in CAR's savanna areas is in a crisis.

Prior to the worldwide 1989 ivory ban, records show that in one year, ivory from 10,000 elephants in the CAR was legally exported. Bokassa's (former President) poachers were organized into a state company and busily killed elephants, all the while acting under the pretext of collecting tusks from already dead elephants. Their friends from Sudan, also free-lance operators, helped in this regard (Tré-Hardy, 1997). Did CITES stop the massacre? No, it did not.

The country was run into the ground by the past Presidents Patassé and Bokassa. Functionaries were paid irregularly. The entire system was very corrupt. Advisors to the president were not advisors placed by the French government. They were what the French call a "basket of crabs" (*panier des crabes*), many not able to return to France without being arrested. They formed a sort of unregulated crime syndicate, which gave a cut of all profits to the president. It is unclear as to whether this has changed under the new leadership in 2003 (SCI Africa Office,

2001a).

There was much controversy over the illegal shipment of Lord Derby eland (20) and western roan (33) out of the CAR in 2000, without proper documentation or authorization of the Game Department by Ricardo Ghiazza, a South African (Italian) game capturer. They were shipped to Togo where they were given legal export documentation with Togo as the country of origin, even though there are no eland left there and only very few roan. President Étienne Gnassingbé Eyadema of Togo³¹⁰ and ex-President Ange-Félix Patassé of RCA are brothers-in-law and this is where Patassé currently lives in exile. The Lord Derby eland were then given temporary transit permits into South Africa and appear destined for an Asian market, though a foot and mouth outbreak in South Africa slowed up this process. Ghiazza's modus operandi was to bypass the line management agency (Eaux et Fôrets/Game Department) and obtain permission from the Office of the President. Walter Betschel, another scam artist, who moves between Austria and Africa, bypassed the line management agency, confiscating long-time hunting operators' concessions by going right to the president. This created incredible instability in the safari industry and put unscrupulous individuals like Betschel in control of hunting concessions that risked to be shot out for short-term gain (SCI Africa Office, 2001a).

Lord Derby eland is a flagship species for the CAR and Cameroon and is the basis of the hunting industry in the savanna lands of these countries. There are certainly less Lord Derby eland (15,000) than elephant and leopard in Africa. The Lord Derby eland is not on the CITES list and only the Western race in Senegal is endangered on the USA Endangered Species list. If it was to be placed on CITES, much of the current flexibility to manage this species and to derive direct benefits would be lost for both the CAR and Cameroon. It would not save the

³¹⁰ Deceased in 2005. Presidency taken over by his son in disputed election.

eland, as international trade is not the issue, but rather the localized commercial bushmeat trade, poor governance, anarchy in the surrounding countries and the loss of these areas as common property by rural communities (SCI Africa Office, 2001a).

What is laughable is that this information, provided by the CAR safari industry and the Game Department³¹¹, about the illegal shipment of the Lord Derby eland was passed on to both the U.S. Fish and Wildlife Service (USFWS) and the Endangered Species Protection Unit of The South African Police (now defunct) by the principal author while managing the Africa Office of Safari Club International (SCI)³¹². Nothing ever happened to Ghiazza. To have even brought them into South Africa, he must have paid someone off, since any wildlife official worth his/her salt should have known that their origin could not have been from Togo.

Uncontrolled poaching in CAR from Chad and Sudan for meat and ivory continues to be a problem into the 21st century. The safari operators cry out but no one listens! One of the last really good areas with healthy populations of unique savanna species (Lord Derby eland, western roan, sing-sing waterbuck, *buffle du savanne*, *kob du buffon*, bubale, etc.) is in the north central part of the CAR, part of the *Program de Developpement de la Region Nord* (PDRN project area), funded by the European Union (EU). About 500-700 Sudanese poachers overran it in 2001. About 300 elephant alone were slaughtered within a few kilometers of the main PDRN Camp at Sangba, with substantial amounts of additional but un-quantified elephant and other animals slaughtered for ivory and

³¹¹ Dominique Ngonba-Ngouadakpa, Directeur de la Faune et des Resources Halieutiques, B.P. 830, Bangui

³¹² Safari Club International, 4800 West Gates Pass Road, Tucson, Arizona 85745-9490 USA, Main Phone: (520) 620-1220, Fax: (520) 622-1205, <http://www.safariclub.org> and Conservation/Education/Humanitarian Assistance Arm - Safari Club International Foundation, <http://www.safariclubfoundation.org> & SCI Africa Office, P.O. Box 10362, Centurion 0046, South Africa. Tel: 27-12-663-8073, Fax: 27-12-663-8075, sciafric@global.co.za.

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meat. As in Cameroon, the poaching of wildlife for meat and ivory is the biggest threat to the future of hunting in CAR (SCI Africa Office, 2001a).

In 2005, Nigel Hunter, director of the UN organization, Monitoring the Illegal Killing of Elephants and wildlife trade expert Esmond Martin estimated that 6,000-10,000 elephants are killed annually for ivory from the Central African Republic, DRC and Chad. The trafficking of this ivory is through Sudan by the Sudanese army with China as the final destination (Majtenyi, 2005). In 2007, Sudanese poachers killed a French professional hunter. Some say it was a deliberate ambush in retaliation for a “shoot-to-kill” anti-poaching effort headed by a Russian ex-special forces officer, while others suggest the poachers were surprised by the vehicle, mistaking it for an anti-poaching squad (Causey, 2007).

CITES fails miserably here. These poachers have never heard of CITES and could care less about trade bans, sanctions and whatever other diplomatic endeavor might take place between governments. They live outside of Western governance. There appears to be no political will on behalf of government to stop such actions. There has been some talk of getting benefits beyond local government to the villages and then getting them to discuss the problem with their relatives on the other side of the border. An estimated reduction of wildlife countrywide by long time safari operator Charles Henri Mortera (*pers. comm. In:* DeGeorges, 2001) over the last 15 years mostly from both local and commercial poaching is contained in Table 10.2. Long-time professional hunter Thierry Fecomme (2001) reinforced these concerns.

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Most of the country is poached out with the last good game areas in the central north side of the country including:

- Aouk, D'Jangara, Chad border, savanna area;
- Bamingue, PDRN area, savanna area; and
- Dzanga-Sangha, forest area in southwest linked to the tri-national park.

Table 10.2: Decline of key mega-fauna from poaching Central African Republic (CAR/RCA)

Species	% Reduction (1)	Cause of Reduction (1)	Reduction (2)	Cause (2)
Kob De Buffon <i>Kobus kob kob</i>	-90	Open Floodplains easy to kill by poachers.	> 5,350, Total population of 135,000 in mid-1980s reduced by 90% by 1990s.	Concentration open floodplains, easy for poachers.
Kob Defassa "Sing-sing" Waterbuck <i>Kobus defassa unctuosus</i>	-90	Near water easy to kill by poachers.	> 1,340, Wide-spread reduction, largest population Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks where 40% reduction in numbers since mid-1980s.	Uncontrolled meat hunting.
Buffalo <i>Syncerus caffer brachyceros</i>	-60-70	Poaching	> 19,000 Eliminated from significant parts of former range.	Poaching
Western Roan (Koba) <i>Hippotragus equinus koba</i>	-50	Poaching	>2,500	Good numbers in Bamingui-Bangoran National Parks. Numbers declining elsewhere from uncontrolled meat hunting from Sudan and Chad.

Table 10.2 (Cont.): Decline of key mega-fauna from poaching Central African Republic (CAR/RCA)

Species	% Reduction (1)	Cause of Reduction (1)	Reduction (2)	Cause (2)
Lewl el Hartebeest (Bubale) <i>Alcelaphus buselaphus lelwel</i> Note: Western Hartebeest (<i>Alcelaphus buselaphus major</i>) extinct for some time from western CAR (2)	-50	Poaching	>8,000. Total population in 1980s 100,000 Main surviving population in Manovo-Gounda-St. Floris and Bamingui-Bangoran National Parks but even here >70% decrease from 1985-1995.	Decline steeply from uncontrolled meat hunting by Sudan/Chad poachers.
Lord Derby Eland <i>Taurotragus derbianus gigas</i>	-30-40	Poaching	> 12,500 out of total for all of Sub-Saharan Africa population of >14,720.	Mobility, shyness and minimum time at water makes them elusive for poachers. Sudanese poaching beginning to be problem.
Lion	-90	Poaching	NA	NA

(1) Mortera (*pers. comm.*) and (2) East (1998)
Table prepared by principal author

Other sources of poaching include:

- **Artisanal diamond prospectors and poaching.** Found in the PDRN area between Quande Dele, Ndele and Yalanga, not in Aouk. Also, found in the southwest and on the border of the new tri-national park area; and
- **Hutu rebel poachers from DRC.** Said to be a big problem.

Chardonnet (2002) attributes the reduction in lion populations in northern CAR to the heavy loss of prey (*kob du buffon*, bohor reedbuck, defassa sing-sing waterbuck) populations due to severe poaching pressure and the

“systematic shooting of lions by nomadic cattle herders entering Protected Areas during the dry season”.

CITES fails in Africa in many ways, especially where anarchy and corruption prevail. Other safari operators such as Bambi (Brooke Chilvers) and Rudy Lubin (*pers. comm.*) and Andre Roux (*pers. comm.*) cry out for the international conservation and hunting community to help, but no one listens and CITES through trade controls cannot stop the devastation on the ground.

10.3.2.3 Politics of despair

Poor national economic policies and performance nullify the great potential of parks and protected areas as important economic generators and reservoirs of biodiversity, since the lack of growth in job opportunities in urban centers or even the contraction of jobs, in trying to survive, can force people back into the rural areas that can no longer support them, exacerbating unsustainable agriculture and other forms of resource mining as a strategy of last resort (de la Harpe, Fernhead, Hughes, Davies, Spenceley, Barnes, Cooper & Child, 2004 *In:* Child, 2004). Over much of Sub-Saharan Africa, because economies are not developing and alternative livelihoods are few and far between, Community-Based Natural Resources Management (CBNRM) programs with their meager benefits and hope for a better future act as a magnet, sometimes placing added pressure on the natural resource base that CBNRM is trying to conserve. In other cases, although there is a tendency for people to leave rural areas for the cities, when they arrive, due to a lack of appropriate urbanization and industrialization and thus few formal sector job opportunities, along with inadequate education that would allow Africans to fit into a global economy, there is believed to be an increasing reverse

migration, which is significant, even if it is small. These returnees do whatever it takes to survive by means of poaching, charcoal making, small farming, grazing and fishing – even if it means degrading the natural resource base. It is believed that IMF/World Bank structural adjustment policies (SAPs) have aggravated this situation (see Chapter 12). Two fine examples of the “politics of despair” are provided in Chapter 9, Sections 9.7.8.1, Politics of despair, Zambia and Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”.

CITES, how are you helping? If anything, CITES exacerbates the problem by taking away the value of wildlife and other natural products and forcing over-harvesting to make up for lower prices paid by CITES “created” black markets. By making something illegal, CITES creates an adversarial rather than collaborative relationship at a local level between nature conservation officials and rural resource users. It forces game officials to enforce the law, as they are but “conservation soldiers/policemen”, implementing what the politicians have enacted, and it forces local resource users to harvest clandestinely and/or to opt out for other land uses as in Southern Maasailand and much of Kenya (Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya.) It creates a lose-lose situation: lower prices for wildlife/nature products for rural people and the inability to manage these resources as they are driven into clandestine black markets discussed in some detail below, where 95% are harvested illegally. The net result is increasing poverty and increasing resource degradation. Granted, this is not just because of CITES, but also because of antiquated government policies that fail to return the resources to rural communities. CITES is the “icing on the cake”, so that even if they had control over their resources, valorization would be that much more difficult to achieve.

CITES thus becomes a cause for decline in wildlife and its habitat by imposing disincentives as opposed to incentives on rural Africans who must bear the burden of living among wild animals. It should be realized that other than for rhino and maybe elephant, habitat loss, not poaching, is the key factor affecting wildlife in Sub-Saharan Africa.

10.3.3 CITES, Drives Ivory Market Underground

In fact, in many instances, by taking away the legal trade value of elephant or other wildlife from Africa and Africans, the wildlife's demise will accelerate. Limited or no trade creates unregulated "black markets" (Duffy, 2000; Thomson, 2003) no different from the "prohibition" of alcohol in the 1920s in America. Parker (2004) goes into some detail on the development of black markets for rhino horn and elephant ivory. The "speakeasies" are Asian countries and the consumers are its citizens. Poaching is beginning to increase in countries like Tanzania (Mantheakis, *pers comm.*) and Cameroon as new parallel markets open to an unregulated trade:

- **Tanzania.** The reduction in the Selous Game Reserve (SGR) budget in 2005/06 [see Chapter 9, Section 9.5.7, Selous Conservation Program (SCP), Tanzania] has been accompanied

"by a steep increase in elephant poaching, which had been so minimal up to 2004 that some of our conservationist friends in Nairobi wrongly suspected that we had forged the figures. Again, as in the 1980s, government vehicles are involved in transporting the tusks of illegal killed elephants, as arrests and confiscations by the police have proved" (Baldus, 2005 *In:* Baldus, 2005).

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The World Bank (2005) reports that politically connected middlemen are the real beneficiaries, paying little to the porters that take all the risks. Tanga is considered the main port for these illegal shipments, with consignments under police escort until they are safely out to sea.

“Over a five year period, 3,704 kg of ivory in transit were intercepted and more than 700 guns impounded at various exit points from Tanzania. Valued at the price that a professional hunter pays for an elephant (US\$ 5,000) the government revenue loss through a single illegal consignment of ivory is US\$ 200 million (error – correctly US\$ 200,000) for 40 elephants killed in sport hunting” (World Bank, 2005).

In late 2005/early 2006 over a four-month period, three lots of 84, 94 and 27 tusks, amounting to about 103 elephants, have been impounded from around the Selous Game Reserve (SGR), with 80% of these tusks coming from the Open Areas of Liwale and Kilwa in the southern and eastern part of the Selous. District authorities are involved (Kibonde, 2006) as well as the military, though those involved at the top of the ivory trafficking pyramid have yet to be identified (Kibonde, *pers. comm.*). The problem is that with a failed wildlife management area (WMA) process,

“the absence of community benefits from wildlife management provides poor rural households with little incentive for conservation” (World Bank, 2005) (see Chapter 9, Section 9.6.3.6, SCP, Tanzania).

- **Illegal Ivory in Cameroon, 2005.** Five poachers were caught with about 100 elephant tusks, leopard and chimpanzee parts using a military truck in September 2005. The Central African region is the principal source of illegal ivory in trade today, both within Africa and internationally, with the forests of southern Cameroon and northern Gabon being among the

last refuges of the threatened Central African elephant (ANON, 2005) (for further discussion on poaching by the Cameroonian military see Section 10.7.2.1, “Enhancement” under the ESA linked to CITES, condemning more wildlife to die? Enhancement Under the ESA as an Impediment to Conservation of Cameroon’s Elephant).

- **Illegal Ivory From Cameroon, 2000.** Ivory poaching is a big problem within the tri-national park of the Lake Lobéké/Chute de Niki/Boumba-Bek National Parks in the southeast forested area of Cameroon, the Nouabalé-Ndoki National Park in the Congo and the Dzanga-Sangha National Park in the CAR. This area has an estimated 70,000 elephants serving as the focus for poaching. In the year 2000, elephant ivory from the tri-national area’s forests was seized by Taiwan customs officials. The vessel originated from Douala, which seems to be the major source of illegal exports. There were 248 tusks, amounting to 2.5 tons and valued at CFA 3.5 billion (US\$ 7 million) (Koulagna, *pers. comm.* In: SCI Africa Office, 2000).
- **Illegal Ivory From Cameroon, 1998.** In 1998, French customs briefly detained a North Korean diplomat at a Paris airport after finding nearly 600 kg (1,300 lbs) of ivory in his luggage. Officials were intrigued that the man, traveling from Cameroon to China, was traveling with 20 suitcases (Djoh a N’Diang, *pers. comm.* In: SCI Africa Office, 1998; SCI Africa Office, 1999).

This is spurred on by a rural populace who do not know or care about CITES and who in trying to survive will take any opportunity they can to generate income, even without the added value of the international market (value goes to the middleman). Thus, elephants and other wildlife become a short-term resource,

whose future CITES cannot control; this is in the hands of the people living with the elephants – rural Africans! The above quantification is likely the “tip of the iceberg” with regard to elephant poaching. For every poacher caught, there are likely 100s that get away, especially if the military or high-level government officials provide cover and protection (Tomlinson, 2007).

10.3.4 CITES Cannot Stop the Bushmeat Trade

The 11th CITES Conference of Parties (COP) held in May 2000 in Nairobi, Kenya, acknowledged the importance and seriousness of the illegal bushmeat trade. The bushmeat trade is another area which has become important to CITES, but which regulations are unlikely to control. At the 11th CITES Conference of Parties, a Bushmeat Working Group (BWG), comprising six Central and West African range states was established as a result of concerns that many Appendixes I and II species are being eaten into extinction and to begin harmonizing legislation and coordination with regard to the bushmeat trade. Its headquarters are based in Yaoundé, Cameroon. Peterson (2003) believes that the three major causes of the bushmeat crisis are: 1) modern lethal means of hunting techniques, 2) modern population growth and 3) industrialized logging (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the Dobi Dobi, More Parks and Protected Areas). A largely USA-funded Bushmeat Crisis Task Force (BCTF) formed in 1999 is a consortium of conservation organizations and scientists dedicated to the conservation of wildlife populations threatened by the bushmeat trade. It is based in Washington, D.C., USA. BCTF coordinates with the BWG with a website and fact sheets to educate the public about this issue.

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Central Africans eat as much meat as many Europeans and North Americans (30-70 kg/person/year), mostly wildlife. The approximately 25-30 million people living in the forests of Central Africa eat approximately 1.2 million metric tons of wildlife each year (Table 10.3) (BCTF, 2000; Wilkie & Carpenter, 1999 *In: LWAG/DFID*, 2002) – the equivalent of almost 4 million cattle (BCTF, 2000). Peterson (2003) puts the consumption of bushmeat at 5 million metric tons/year for 30 million inhabitants living (not total population) in the Congo Basin, equivalent to 20 million cows and steers. Peterson (2003) estimates that the average resident of the Congo Basin eats 47 kg/person/year of bushmeat compared to 30 kg/person/year in northern industrialized cities (e.g., Europe and North America).

Bushmeat constitutes ~80% of all animal-based protein consumed in Central Africa and it represents as much as 50% of daily protein intake for rural and urban families in that part of Sub-Saharan Africa (Figure 10.3).

In the forest region, as the most commonly hunted antelope (*duiker/cephalope*) numbers decline from over-hunting mostly by snaring and habitat degradation, hunters shift to crossbows and poisoned arrows or more expensive shotguns to harvest primates (BCTF, 2003). Although already unsustainable, Peterson (2003) predicts the demand for bushmeat in the Congo Basin could be 10 million metric tons by 2025 and 20 million tons by 2050. Contamination of hunters when butchering primates is now believed to have been the major reason for HIV/AIDS developing in humans (see Chapter 5, Section 5.8.1, Linking HIV/AIDS to the Bushmeat Trade).

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Table 10.3: Estimates of bushmeat consumption in Equatorial Africa

Country	Forested Area (km ²)	Population In Forested Area	Population In Urban Centers Consuming Bushmeat	BUSHMEAT CONSUMED (Tons/Year)	BUSHMEAT Per km ² Of Forest	Bushmeat Consumed Per Person Per Year
Cameroon	155,330	1,424,000	2,214,620	78,077	503	22
CAR	52,236	219,500	539,775	12,976	248	17
DRC	1,190,737	22,127,000	3,782,369	1,067,873	897	41
Equatorial Guinea	17,004	183,000	227,500	9,762	574	24
Gabon	227,500	181,700	581,440	11,380	50	15
Congo Brazzaville	213,400	219,500	1,245,528	16,325	77	11
TOTAL	1,856,207	24,354,700	8,591,232	1,196,393	645	36

Source: Wilkie & Carpenter (1999) *In: LWAG/DFID (2002), Department for International Development (DFID), Great Britain, public domain*

The 2 million km² Congo Basin accounts for 25% of the world's and nearly 75% of Africa's remaining rain forests, containing half the world's wild species: 400 mammal species, 1,086 species of birds, 216 species of reptiles, 400 species of fish, etc. feeding 30 million Africans. Only 20% of the world's rainforests (tropical lowland hardwood forests) remain intact (Peterson, 2003) (see Chapter 5, Section, 5.9.4.1, Current forest cover, Sub-Saharan Africa, Tropical Rain Forests/Dense Humid Forests.

Around the Korup National Park in Southwestern Cameroon, hunting provided 56% of the total village income and was the most important source of income at village and household level with over 80% of the biomass off-take from the national park consisting of terrestrial mammals. In Conkouati, Congo Brazzaville, hunters sold 80% of their catch, resulting in an average household income of 1,250,000 CFA/ US\$ 1,923 (per year?) of which 64% came from fisheries, 16% from agriculture and 20% from hunting (Roe, Mayers, Grieg-Gran, Kothari, Fabricius & Hughes, 2000). Bushmeat is cheaper than domestic meat in the rural areas, but its value increases two to three times by the time it enters major urban centers, often making it more expensive than domestic meat though it remains culturally preferable to the latter (Peterson, 2003). Smoked elephant in Bangui, CAR is valued at US\$ 11.99/kg (US\$ 5.45/pound), "more than any other kind of meat including beef and pork" (Tomlinson, 2007).

In some Central African countries, traditional hunting rights may be recognized within modern law, but hunting for commercial purposes is generally considered illegal unless officially licensed. Modern (*de jure*) laws are often subordinate to customary management regimes due to the lack of capacity of the state to enforce regulations (Roe, *et al.*, 2000) and alienation of rural resource managers against far removed, often corrupt and self-serving centralized management systems, in which case management is guided by customary law or no law at all. Bushmeat

becomes an “Open Access Resource” as centralized management fails and customary laws and management have been weakened and compromised by the state. The widespread practice of selling bushmeat throughout the region demonstrates the general lack of regard for wildlife legislation and the lack of capacity for governments to impose it (Roe, *et al.*, 2000). This is the case even when recognized traditional hunting is rarely traditional, with wire snares replacing vegetative snares and shotguns/high powered rifles replacing bows, crossbows, nets and spears.

In much of West Africa, human population densities are 25-78 persons/km² compared to countries in the Congo Basin of 5-20 persons/km². Wildlife populations have been so depleted by unsustainable hunting (and habitat destruction) in West Africa that bushmeat is no longer the most important source of protein in families’ diets. Rodents have replaced the over-hunted and now scarce antelope and primates as the most commonly eaten wild animals (BCTF, 2002; BCTF, 2003).

Additional estimates of the bushmeat trade in West and Central Africa that could exceed US\$ 1 billion/year in value (BCTF, 2000) include:

- **Bushmeat Cameroon.** 9 tons/day of bushmeat arrive in Cameroon’s capital Yaoundé, 4 tons/day via train and 5 tons/day via logging trucks (MINEF/SCI, 2000). WSPA (2000) and Peterson (2003) estimate that 70-90 tons of bushmeat/month arrive in Yaoundé;
- **Bushmeat Central African Republic.** About 40% of protein in Bangui, the CAR, is from bushmeat. It is estimated that Bangui consumes the annual equivalent of 9,500 tons of fresh bushmeat valued at 8 billion CFA

(US\$ 13.3 million)³¹³ or 1% *Produit Interieur Brut* (BIP - Gross Domestic Product GDP)³¹⁴ and country-wide an equivalent of 48,000 tons of fresh bushmeat valued at 16,500,000,000 CFA (US\$ 27.5 million)/year or 2.5% of the BIP (Canopee, 2000);

- **Bushmeat Gabon.** A minimum of 500 tons/year is sold in the capital Libreville (WSPA, 2000);
- **Bushmeat, Congo Brazzaville.** In Ouesso, the largest town in northern Congo, 5,700 kg/week is consumed (WSPA, 2000; Peterson, 2003), amounting to 0.5 kg/person/week of bushmeat from 39 species in a population of 11,000 people. Gorillas arrive on the average of 1.6/week (Peterson, 2003);
- **Ivory Coast.** The annual yield/catch of bushmeat was estimated at 77 billion CFA (US\$ 152 million)³¹⁵ or 1.4% of the BIP³¹⁶ amounting to 35.5 million game animals (mostly small game such as duiker, civets, warthog, pangolins, porcupines, monkeys and squirrels), but also some large antelopes such as bushbuck (Caspry, 1999). Zeba (1998) provides an estimate that bushmeat contributes US\$ 400 million/year to the Ivorian economy. This amounts to 12% of the total animal protein consumed in

³¹³ CFA 600/US\$ in 2000

³¹⁴ GDP (Gross Domestic Product) is the market value of new goods and services produced by the input factors (capital and labor) located within the geographic boundaries of an economy. Gross National Product (GNP) allocates product according to the *nationality* of the owners of the factors. GDP (Gross Domestic Product) allocates product according to the *location* of the owners of the factors. GDP = GNP - Net Factor Payments (NFP). NFP is the net income paid to domestically located factors by foreign owned factors.

³¹⁵ CFA 507.85/US\$ in 1996

³¹⁶ BIP = *Produit Interieur Brut* = Gross Domestic Product GDP

the Ivory Coast (de Bie, 1990 *In: Lycklama à Nijeholt, de Bie & Geerling, 2001; Kouame, pers. comm.*);³¹⁷

- **Ghana and Parts of Mali.** Bushmeat constitutes a critical source of protein: 40% of the total animal protein consumption takes place in the Ghana savanna zone, 60% in the Ghana forest zone and 20% in the Baoulé region in Mali (de Bie, 1990 *In: Lycklama à Nijeholt, et al., 2001*), particularly for poor people in rural areas (Lycklama à Nijeholt, *et al.*, 2001); and
- **Senegal.** In the 1970s, the population consumed 380,000 tons of bushmeat/year (Peterson, 2003).

Recent studies (TRAFFIC, 2000; Cambell, Nelson & Loikooki. 2001 *In: LWAG/DFID, 2002*) in East and Southern Africa indicate that bushmeat consumption in savanna/rangelands can be as high as in the forests of West and Central Africa, especially in times of economic hardships, drought and famine. For instance, bushmeat was 75% cheaper than domestic meat in Zimbabwe, with similar findings for six of seven countries surveyed in the region.

Barnett (2000 *In: Magome & Fabricius, 2004 In: Fabricius, et al., 2004*) estimates that bushmeat is 50% and 30% cheaper respectively than domestic meat in Zimbabwe and Botswana in rural areas, while in affluent urban centers, bushmeat costs 43% more than beef in Zambia and 157% more than beef in Mozambique. In Botswana, 43% of the households surveyed average 18.2 kg of bushmeat/month in areas where this is the only affordable protein. In the Maputo Province, Mozambique, 50 tons of bushmeat/year is traded. Child and Clayton

³¹⁷ Kouassi Joachim Kouame, Head of Anti-Poaching in Protected Areas, Department of Nature Conservation, Ministry of State/Ministry of Environment, B.P. V178, Abidjan, Cote d'Ivoire, ahounze@yahoo.fr

(2002) estimate that 45,000 inhabitants of the Lupande game management area (GMA) in the Luangwa Valley of Zambia, where poverty and malnutrition are widespread, get some 30% of their nutrition from wild foods (see Chapter 9, Section 9.8.5.2, LIRD).

Barrow, Gichohi and Infield (2000) estimate that the per capita percentage total animal protein comprising bushmeat in East Africa is:

- 5 % in Uganda
- 2.6 % in Kenya
- 1.6 % in Tanzania
- 26.8 % in DRC

In the western Serengeti, Tanzania, more than 33% of the traders rely on bushmeat as their sole source of income (TRAFFIC, 2000 *In: LWAG/DFID*, 2002). In the farming areas of the western Serengeti, even with village game quotas harvested by the Wildlife Department and meat sold cheaply to the community, the trade in bushmeat is estimated to make up 33% of the average farm income (Kauzeni & Kiwasila, 1994 *In: Roe & Jack*, 2001). About 60% of the households regularly sell or consume bushmeat (Enjen Olsen, 1998 *In: Roe & Jack*, 2001). According to some studies for 67% of rural Tanzanians, bushmeat is their major source of protein (DPG, 2005). It is estimated that the illegal bushmeat trade is worth US\$ 50 million/year in Tanzania (World Bank, 2005), which is more valuable than overseas trophy hunting valued at US\$ 27-39 million/year (Baldus & Cauldwell, 2004). Baldus (2002) supports establishing sustainable bushmeat harvesting programs in Tanzania with the idea that “if the consumption of venison, can help to conserve wildlife, we should encourage this instead of banning it”. In the case of the Selous Conservation Program (SCP), participating villages are given bushmeat hunting quotas that are harvested by

1980

village game scouts and the meat is sold inexpensively in the village (see Chapter 9, Section 9.6.3.6, SCP, Tanzania). This appears to be a step in the right direction but does not necessarily address cultural ties to hunting (see Chapter 9, Section 9.7.3, Failure to Integrate Cultural Ties towards Wildlife into CBNRM).

Bushmeat research has tended to be driven by conservation and concern for its impacts on endangered forest species rather than livelihoods. Bushmeat in Sub-Saharan Africa for the most part is consumed within borders of sovereign states over which CITES has no control. A small percentage crosses local borders and almost all bushmeat in Sub-Saharan Africa is traded on the subcontinent, something that cannot easily be controlled by CITES and trade controls (LWAG/DFID, 2002). Furthermore, the majority of bushmeat species are not endangered and thus will be controlled with difficulty by CITES trade regulations (Bowen-Jones & Pendry, 1999 *In:* LWAG/DFID, 2002).

Controlling and/or sustainably managing the bushmeat trade will take on the ground collaboration with local communities, who consume bushmeat and who are involved in the trade of bushmeat to assure that it is sustainably managed. This is beginning to happen on a pilot basis in Ghana through the Ghana Bushmeat Research Project, which favors formalized trade that can be managed over prohibitions, which risk to drive this trade underground (LWAG/DFID, 2002). The new programs of *gestion des terroirs*, which stress sustainable management of wildlife and forests in West Africa, appear to be a way forward. The Wildlife Conservation Society (WCS) in the Congo is said to be working with a German logging company to assure sustainable bushmeat off-take to feed the local workforce. This is another example of on the ground efforts which will be needed (LWAG/DFID, 2002), though some question the validity of this program (Peterson, 2003) [see Chapter 11, Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)]? In Southeastern Cameroon, the Association of

Bushmeat Collectors (*Association des Collecteurs de Viande*) has been functional since about 2005 in an attempt to formalize and begin regulating the trade (see Chapter 11, Section 11.11.6.4, Logging companies and the unsustainable bushmeat trade).

The trade in bushmeat will never be stopped as it is ingrained in the culture of most Africans. This is similar to the urban demand for charcoal in West Africa, where for cultural reasons, people prefer charcoal to other alternatives (e.g., natural gas) for making tea and cooking (Chapter 5, Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal linked to charcoal making, over-population and declining fallow periods and Chapter 9, Sections 9.8.9.2, Communal Natural Forest Management, Guesselbodi, Niger and 9.8.9.3 Community-Based Natural Forest Management, *Gestion des Terroirs*, Burkina Faso). However, these resources (e.g., bushmeat and charcoal production) must be managed and controlled at the local level in collaboration with governments as a sustainable source of income, energy and protein. Barnett (2000 *In:* Magome & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004) states,

“once benefits accrue to land-holders from a resource they own, wildlife play an important sustainable role in community development and, by doing so, ensure its continued survival”.

Certainly, international treaties such as CITES or sanctions on international shipping of logs (see Chapter 11, Section 11.11.6.10, Sustainability of logging in Southeastern Cameroon/the Congo basin, Section 11.11.6.11, Certification for sustainable logging and Section 11.11.6.12, Volume and value of timber from Cameroon/Congo Basin), which could be necessary for other reasons, will not solve these localized problems that are believed to be more of a threat than international trade.

LWAG/DFID (2002) believes that the community managed bushmeat trade has potential but is confronted with the following constraints:

- Different bushmeat management regimes are required for different environments such as primary versus logged forests, farm-fallow areas, savannas, etc.;
- There is a lack of effective community bushmeat management models. Most bushmeat is harvested illegally, empowering hunters and traders while excluding non-members in determining the distribution of benefits;
- Where human population densities are low, there are high transaction costs of intervention (by donors/NGOs) to establish a program;
- There is little social cohesion in peri-urban areas, making intervention along the supply line difficult; and
- Legislative weaknesses and ambiguities over land tenure and user rights and relevant institutions at the national and local level are often weak and/or corrupt.

Alternatives such as substituting domestically raised species for wild species in high rainfall areas have met with limited success due to a lack of food supplies and disease (LWAG/DFID, 2002). A recent analysis by Defo (2005) in Southeastern Cameroon indicates that due primarily to the cost of transport into the area, in addition to cultural ties to bushmeat, domestic and other sources of protein cannot compete with bushmeat economically (Table 10.4). Bushmeat in Southeastern Cameroon sold for between US\$ 0.55-1.46/kg (\approx 547 CFA/US\$ & 650 CFA/Euro) compared to domestic meats that sold for US\$ 2-3.46.

1983

Table 10.4: Comparison of bushmeat prices/Kg to alternative sources of protein, Southeastern Cameroon

TOWN SOUTHEASTERN CAMEROON	Bushmeat Gross Value CFA	Bushmeat CFA/Kg	Bushmeat Euro/Kg	Bushmeat US\$/kg	Domestic Protein CFA/KG	Domestic Protein Euro/KG	Domestic Protein US\$/kg
LIBONGO	Porc-épic ≈ 4kg: 1,500-2,000 CFA	375-500	0.58-0.77	0.68-0.91	Beef: 1,500-1,600 Frozen Fish (<i>Maquereau</i>) 1,300	2.31-2.46 2.00 2.92	2.72-2.91 2.36 3.46
MOULOUDOU	Blue Duiker ≈5kg: 1,500-2,500	300-500	0.46-0.77	0.55-0.91	Beef: 1,500-1,700	2.31-2.62	2.73-3.09
OUFESSO (LAMEDOUM)	Monkey ≈ 5kg: 2,000-2,500	400-500	0.62-0.77	0.73-91	Beef: 1,100	1.69	2
YOKADOUMA	Nguenzi (biche) Smoked duiker/cephalope 10 kg: 5,000-8,000	500-800	0.77-1.23	0.91-1.46	Beef: 1,400-1,600	2.15-2.46	2.55-2.91

Source: Extracted from Defo (2005) with permission, WWF

Similarly, Wilcox & Nambu (2007) found in Southeastern Cameroon from 1999-2002 that the most expensive bushmeat, pangolin, selling for US 1.06/kg (\approx CFA 700/US\$ & & 656 CFA/Euro) field dressed, was half the price of the cheapest domestic meat, chicken, selling for US\$ 2/kg butchered. On the other hand bushmeat in the major urban centers can cost more than domestic meat, due to a combination of transport, demand and competitive domestic meat markets (Wilcox & Nambu, 2007).

Game ranching, as in Southern Africa, is capital intensive and requires management and marketing skills not yet available to the majority of the rural poor. Likewise, while the cane rat is a success story in Benin, 600 farmers raising 18,000 rats, Bowen-Jones, Brown and Robinson (2001 *In: LWAG/DFID*, 2002) state that major bushmeat species with the potential for domestication have long been discovered. There is little biological basis for the ability to successfully breed most targeted bushmeat species under captive conditions.

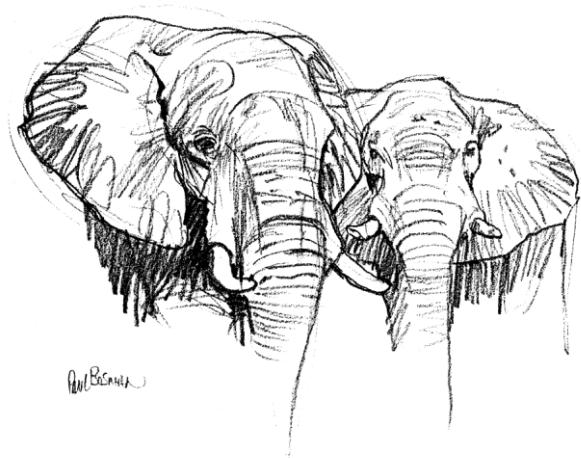
Ultimately, what is wrong with the commercialization of bushmeat? South Africa has among the largest and most lucrative formal bushmeat trade in the world let alone Sub-Saharan Africa. Landowners raise game on their fenced ranches. Game harvested by local meat/biltong hunters along with cropped game sold in butcheries in 2005/2006 was valued at nearly US\$ 449 million/year, over half the total annual US\$ 670,857,142 value of the game industry from sustainable use and more than 4x as valuable as overseas trophy hunting/taxidermy - valued at US\$ 101.5 million/year to South Africa (NAMC, 2006) (see Chapter 5, Section 5.12.7, Attaining Food Security through More Appropriate Land Use Options):

- US\$ 443,000,000/year: Biltong (resident) hunting (66% value of total game industry); and
- US\$ 6,000,000/year: Venison market (1% of total game industry)

1985

As long as it is managed, the bushmeat trade combined with trophy hunting and even eco-tourism is not a problem, harvesting from 12 to 25% of the annual wildlife population.

10.4 THE AFRICAN ELEPHANT



Source: with permission from the artist, Paul Bosman, Wildlife Investment, Inc.,
<http://www.wildlifeart.net/books.html>

“Socio-economic issues are more important than biological issues in determining the survival of the African elephant (*Loxodonta africana*). Elephant and Africa’s predominantly rural population are sympatric and in competition for the same resources. The cost of managing elephant is estimated at not less than US\$ 200 km² or US\$ 800/head/year at sustainable carrying capacity, assuming the level of available expertise. Few African governments can afford to manage elephant or have the expertise, even with the 4% of the region that is nominally protected...African governments cannot afford to compensate indigenous people, among the most disadvantaged groups in the world, for the inequitable costs imposed on them by expecting those with elephant on their land to conserve the species. The net result is that the elephant will survive only if it is the wish of the poor peasant communities struggling to stay alive, and this will be when it is to their economic advantage to do so. Irrespective of any biological criteria, elephant populations will continue to decline, some more slowly than others, unless the species is able to realize its economic advantage so that it can compete favorably for the

1986

limited resources available...The amount of lost revenue by rural communities in living with elephant under prevailing livestock regimes in some 70% of Africa south of the Sahara, where the average rainfall is 750 mm or less, is estimated at US\$ 2,800/elephant/year from lost beef production alone" (Child, 1993).

"Well-meaning preservationists create problems by limiting local people's ability to market certain resources such as elephant products",

a quote from "Evaluating Eden: Exploring the myths and realities of community-based wildlife management" (Roe, *et al.*, 2000).

10.4.1 Threatened Under the ESA

In 1978, the USA classified all African elephants as "threatened" under its own USA Endangered Species Act (ESA) (ESA, 1999; USFWS, 1999), even though they were really only threatened in Kenya and Tanzania, Uganda, Somalia, Sudan, the CAR, Angola, West Africa and Zambia. The "threatened" category falls below the most serious level of "endangered" under the ESA. In theory, for those elephants and/or other species with CITES hunting quotas there should not be a problem coming into the U.S. with proper paper work (e.g., CITES export documentation and veterinary certificate) from the exporting country. However, as is seen below, "enhancement" under the ESA is used to block such entries.

10.4.2 Western Protectionist NGO's Begin Lobbying to Place African Elephant on CITES Appendix I

"...trade in elephant ivory, articulated at international level through meetings of the Convention on International Trade in Endangered Species (CITES) has led to serious conflict between those in Southern Africa who argue for the rights of local communities to utilize elephants in a sustainable way, and Western pressure groups who believe that any trade in elephant ivory will

lead to high levels of poaching and their ultimate extinction" (Roe, *et al.*, 2000).

In the 1980s, the ivory trade was worth US\$ 50-60 million/year to Sub-Saharan Africa. However, there were problems. In the 1980s, the African elephant population was cut in half from 1,300,000 to 600,000 (Duffy, 2000; Thomson, 2003) mainly due to illegal off-takes, often with government complicity, especially in Kenya, Uganda, Tanzania and Zambia, while Southern African elephant populations continued to grow and were well managed (Duffy, 2000) (see Section 10.2, AFRICAN INDEPENDENCE AND POACHING).

The demand for ivory in the 1970s and 80s came primarily from the U.S., Europe and the Far East, especially Hong Kong and Japan, which accounted for 75% of the pre-ban ivory imports for jewelry and personal seals (*hanko*) in Japan and carvings in Hong Kong for re-export to China, Japan, South Korea and Taiwan.

In order to control the illegal export of ivory, CITES created an export quota system where each country set its own quotas. Countries whose tusks were not CITES acceptable, sold them at half the market price through countries like Burundi, Singapore (Duffy, 2000; Parker, 2004) and Dubai (Parker, 2004) that had no indigenous elephants. It is estimated that Burundi was exporting the ivory of 18,000 elephants/year smuggled in from surrounding countries (Rosenblum & Williamson, 1990). Potgieter (1995), in an interview with Ian Parker, and Parker (2004) go into great detail with regard to how Burundi, that was not a party to CITES in 1986, was the largest exporter of ivory in Africa. In 1985 CITES parties decided that no future ivory tusks could be traded without accompanying CITES certificates. CITES parties had 18 months or until the end of 1986 to register existing stockpiles (Potgieter, 1995). In collaboration with CITES, attempts by Parker to register Burundi's "pre-convention" ivory failed as a lever to have Burundi become a party to CITES, and to move this ivory out of the country so

that the stores would be empty. This would make it difficult for new ivory to be illegally trafficked through Burundi from other countries. Parker estimated the 18,000 tusks weighing 90 tons that he found in Burundi to be linked to a US\$ 35 million/year trade. He estimated that over a five year period leading into 1986 that 1,500 ton of ivory averaging 5 kg/tusk had been smuggled into Burundi from neighboring countries, representing over 100,000 elephants. The CITES secretariat panicked when seeing how much ivory was involved and decided not to let the ivory out of Burundi immediately. This is believed to have resulted in illicit ivory increasing in value by 300% and encouraging more poaching. Parker links the smuggling of Burundi ivory off the continent, laundered through Mozambique as legal CITES certified ivory, to the South African intelligence community and the infiltration by these individuals into Operation Lock that was supposed to stop such smuggling (see Chapter 13, Section 13.7.1.1, Legitimization of private military companies/contractors [PMCs] by Western governments and international bodies) (Potgieter, 1995; Parker, 2004). The IMF/World Bank driven liberalization of economies in countries such as Tanzania, Zambia and Zaire resulting in freely convertible currencies eventually ended Burundi's role in ivory trafficking (Parker, 2004).³¹⁸ However, this has

³¹⁸Burundi franc fixed 1 to 1 against Belgium franc and eventually linked to US \$, as well as gold during period in question. By 1970s Tanzania Uganda and Kenya Shillings pegged to US\$ and/or pound sterling, but as the US \$ left the gold standard on August 15, 1971 and currencies fluctuated widely These countries at times stopped all foreign currency transactions, but by late 1975 pegged their currencies to IMF Special Drawing Rights (SDRs), after which their currencies continued to devalue under various relationships. By 1990, Uganda opens first FOREX bureaus, Tanzania following in April 1992. Burundi's currency remained stronger, linked to gold until 1978, not following the devaluation of the U.S. dollar as the other three countries, but by 1983 pegged to the SDR, after which it also suffered devaluation. Neighboring DRC, fluctuated back and forth between being pegged to the Belgian Franc and US\$ during this period, switching to the SDR in 1976 (Schuler, 2007). Parker (2007a) remembering those times says, "I do not have Burundi exchange rates, but can confirm that all currencies were freely convertible. One set of ivory/gold buyers, had so great a demand for dollars that they imported them in parcels directly from Switzerland. I was so incredulous that I wanted to see this for myself, and personally went with them to collect \$250,000 in brown paper parcels with seals off a Sabena flight at Bujumbura. It even crossed my mind that if ever I was to conduct a heist this was the place to do it. Park my own aircraft at the airport, intercept the parcel carriers, take the parcel(s) and just fly away. Thus did I dream"!

done little to end the black market trade in ivory (see Section 10.3.3, CITES, Drives Ivory Market Underground) or to allow large quantities of ivory to be moved through legal CITES loopholes (see Section 10.4.6.4, Zimbabwe). Burundi and Singapore eventually joined CITES, but at the height of their ivory trading, they were not members. Burundi still has about 80 tons of ivory stockpiled that CITES will not allow it to sell (Parker, 2007b).

While the decrease in ivory exports³¹⁹ from Sub-Saharan Africa was often attributed to the ivory quota system, others believed that it was due to declining tusk size from a declining and younger elephant population, resulting in more elephants being killed for less ivory. There was a concern that corrupt officials were moving illegally harvested ivory through the “legal” ivory quota system through a legal loophole. “Carved ivory” was not covered in this quota system. In addition, the illegal trade thrived in parallel. Everyone from African government officials to diplomats was involved in the smuggling of ivory (Duffy, 2000). Parker (2007b) argues that CITES permits have always been required for carved ivory, though it is sold illegally on a large scale around the world. If so, as will be seen below, there are other loopholes, and/or as noted, there is the black market that is difficult to control!

By the late 1980s, Western protectionist NGOs mounted a campaign to upgrade elephant onto CITES Appendix I, which would stop trade in elephant ivory and other products. One of the leaders behind this movement was the African Wildlife Foundation (AWF), an NGO started in America by hunters to train Africans in wildlife management at the time of independence. They helped start the Mweka Wildlife College in Tanzania (official name, College of African Wildlife Management, Mweka) (Bonner, 1993).

³¹⁹ Fell from 868 tons/year from 1979-1985 to 587 tons in 1986 and to 176 tons in 1989.

1990

By 1983, AWF had become a classic Western conservation NGO, of which the main objective was to raise funds for Westerners to undertake “pure” wildlife research in Africa, most of which had no applied management objectives (see Chapter 11 Section 11.10.3, Creation of Powerful Conservation NGOs by Western Donors). AWF was the first to call for a total ban on ivory trading in 1989. In 1988, when AWF launched its “Don’t buy ivory” campaign, its budget was US\$ 2 million/year. After this campaign, its membership doubled and it became a major player in the “wildlife game” (Bonner, 1993).

AWF and most traditional conservation NGOs (e.g., WWF/U.S.,³²⁰ WWF/International³²¹ and Wildlife Conservation International³²²) and their researchers did not believe that a total ban on the ivory trade would stop elephant poaching. Besides, for a number of Sub-Saharan African countries, ivory sales generated a substantial amount of revenue for both conservation and government. For instance, Zimbabwe in the 1980s earned US\$ 2 million annually from legal ivory sales (Bonner, 1993).

However, the membership constituency of many NGOs was not sophisticated enough to understand how revenue from the killing of elephants could save elephants. Most members believed that contributing money to these NGOs was helping to preserve wildlife. These NGOs did not try to explain concepts such as sustainable use, culling, game cropping³²³ and hunting in the African context and why wildlife must serve as an economic and cultural resource for management and poverty alleviation if it is to survive (Bonner, 1993).

³²⁰ WWF-US, Washington, D.C., <http://www.worldwildlife.org/>.

³²¹ WWF International, <http://www.panda.org/>.

³²² Today: Wildlife Conservation Society, New York, USA, linked to New York Zoological Society <http://www.wcs.org/>.

³²³ Cropping is the sustainable harvest of meat, skins and other by-products from a game population for economic purposes. Culling is reduction of a game population as part of a management strategy.

Thus these NGOs, against the opinions of many of their staff researchers, opted to support a ban on the ivory trade as a fund-raising mechanism for themselves (Bonner, 1993; Duffy, 2000), as well as out of fear of membership losses if they came out in support of elephant culling (Bonner, 1993). This has not changed even in the 21st century. In essence, these NGOs joined with the animal rights movement, including the Environmental Investigation Agency (EIA), the Humane Society of the United States (HSUS), Friends of Animals,³²⁴ Defenders of Wildlife,³²⁵ International Fund for Animal Welfare (IFAW), sacrificing their principles for money and abandoning most Africans as well. Only David Western of Kenya and the Wildlife Conservation International/Wildlife Conservation Society (WCS) would seek some accommodation to the Southern African requests (Bonner, 1993) where elephant populations were growing.

Graham Child (1995) equates the use of elephant by Western NGOs for fundraising with a form of “commercial poaching” in which elephants are used for commercial gain with little or no concern for the elephant, or other species. If anything, he believes that Zimbabwe should be reprimanded for having too many elephants, which are destroying the natural habitat and biodiversity of the country. It takes about 4 km² to support one elephant (Martin, 1989; Craig, 1989 both *In:* Child, 1995). This would have required 40-80% of Zimbabwe’s territory by the mid-1990s given their elephant population. These Western NGOs were backing failures in elephant management, such as Kenya, and punishing countries like Zimbabwe, Namibia and Botswana for conservation successes, by taking away the economic incentives for conservation and the much needed revenues for conservation and development that could come from the legal sale of skin and

³²⁴ Friends of Animals’ President is Priscilla Feral, who works from FoA’s International Headquarters, 777 Post Road, Suite 205, Darien, CT 06820 USA, Phone: 203-656-1522, Fax: 203-656-0267, info@friendsofanimals.org, <http://www.friendsofanimals.org/about/index.html>.

³²⁵ Defenders of Wildlife, National Headquarters, 1130 17th Street, NW, Washington, DC 20036 USA, <http://www.defenders.org/>.

1992

ivory. Child (1995) goes on to say that the push for the 1989 ban on the commercial sale of elephant products by well-intentioned urban Westerners as a means of saving the elephant was just the opposite of the pragmatic economic approach taken by rural Zimbabweans in achieving the conservation of this charismatic natural resource. This demonstrated their complete misunderstanding for the realities on the ground at the time. Thus conforming to anthropocentric norms such as not killing animals allows charismatic mega-fauna such as elephant, to which we so closely relate, to damage long-term ecological processes (Child, 2004).

Just prior to the trade ban in 1989, ivory was bringing in US\$ 300/kg, while poachers were making maybe US\$ 65/elephant killed, tusks averaging 5 kg each. As opposed to formally integrating rural communities and even rural poachers, “traditional hunters”, into the sustainable management of elephants, the ban continued(s) to drive the black market, rural communities getting a fraction of what they could get from a formal and legal market. From elephant hide alone, Zimbabwe was making US\$ 1.2 million/year, a product that came from regulated government culling, as poachers could not deal with this product deep in the bush (Thomson, 2003).

A major media blitz was run in the West about the slaughter of the “endangered” African elephant. By June 1989, all ivory imports were banned into the USA under the African Elephant Conservation Act (AECA) passed by the U.S. Congress to save the elephant. The Act (AECA) exempted tourist hunting (sport hunting) trophies of elephant where it could be demonstrated that regulated sport hunting contributed to elephant conservation and was not the cause of the decline (Bonner, 1993).

1993

The Southern Africans mounted a campaign to spare their elephants from the CITES Appendix I listing, led by people like John Hanks, David Cumming and Rowan Martin. Tanzania and Kenya took the lead in listing the African elephant on Appendix I of CITES. Tanzania was later shocked to discover that the USA had stopped the import of African elephant hunting trophies, unless proven beneficial, as well as commercial imports of ivory. Kenya, on the other hand, had not had tourist hunting (sport hunting) since 1977, so it had no such legal trade to care about (Bonner, 1993).

10.4.3 U.S. Government Threatens African Countries with Foreign Aid Cuts

In July 1989, 17 African countries met in Gaborone, Botswana, to come up with a unified stance on elephants for CITES. Only five African countries supported the ban, namely Kenya, Tanzania, Ethiopia, Somalia and Zaire. The meeting was dominated by U.S. and European protectionist groups. The U.S. Government subtly threatened both Zimbabwe and Botswana with foreign aid withdrawals if they did not support the ivory ban. They initially refused to accept the Tanzania/Kenya proposals (Bonner 1993). Thomson (2003), who attended the 1989 CITES conference, claims that the U.S. delegation threatened all African countries who would vote against placing elephants on CITES I with foreign aid cuts.

Duffy (2000) explains that northern states threatened cuts in foreign aid for states that supported Zimbabwe, Botswana and Namibia's request for trade in ivory, while only supporting trade if there was a common African policy on ivory trade, but making the achievement of this goal very difficult if not impossible. The French have made similar threats to their former colonies at COPs 10 and 11 (Francophone Africa Delegates to CITES COP 10 and 11, *pers. comm.*).³²⁶

³²⁶ Issah Djoh N'Diang, then Deputy Director of Wildlife, MINEF, Yaounde, Cameroon and Dominique Ngonba Ngouadakpa Director of Wildlife, *Direction de la faune et des Resources Halieutiques*, BP 830, Bangui, RCA

1994

10.4.4 Leakey and Ivory Burning, Good for Kenya but No One Else

A few days after this meeting, Richard Leakey, the new Kenya wildlife service director, held the famed burning of 12 tons of ivory, worth US\$ 3 million (Bonner, 1993; Leakey & Morell, 2002). President Moi lit the fire saying,

“To stop the poacher, the trader must be stopped. And to stop the trader the final buyer must be convinced not to buy ivory. I appeal to people all over the world to stop buying ivory” (Leakey & Morell, 2002).

This was to be the “shot heard round the world”, and was the lid on the casket for the ivory trade. This publicity helped Leakey and the Kenya Wildlife Service (KWS) to become the recipient hub of US\$ 150 – 250 million from the World Bank, USAID, Japan, Germany and Italy, so many joined with Kenya in the mistaken belief that they too could share in the wealth (Bonner, 1993; Leakey & Morell, 2002). Thomson (2003) claims that in a personal conversation he had with Leakey, while debating with him at Wits University, South Africa, in 1992, Leakey claimed that he had been coerced into burning the ivory by the Americans who promised him [Kenya Wildlife Service (KWS)] US\$ 300 million. If correct, this implies that the U.S. government, infiltrated by animal rights groups, was an important role player in the ivory ban, using covert tactics along with threats of foreign aid cuts to orchestrate the African elephant being placed on CITES Appendix I. No one thought to ask the rural poor what they thought or to consider the benefits of the ban to organized crime that takes advantage of this poverty.

At CITES in October 1989, a counter proposal for a split listing, Appendix II for Southern Africa and Appendix I for the rest of Africa, which would allow Southern Africa to commercially trade in ivory, was defeated 70 to 19. At the same time, advocates of an Appendix I listing for all African elephants did not have the two-thirds (67%) vote required for a CITES proposal to be adopted. The

1995

majority of Africans wanted to keep the elephant on Appendix II, which would allow legal commercial trade and were supported by many developing world states (Bonner, 1993).

AWF suggested that all elephant be placed on CITES Appendix I, with the right of a given country to submit to a CITES panel of experts a request to have its elephant population down-listed. This was submitted as a proposal by Somalia and passed 76 to 11 (Bonner, 1993). The countries of Zimbabwe, Botswana, Mozambique, Congo, Gabon, Cameroon and South Africa, who combined have over half the continent's elephant population, voted against this proposal (Bonner, 1993). All African elephants were on CITES I and Sub-Saharan Africa, its people and their natural resources lost again to eco-colonialism. Once again, the fate of Sub-Saharan Africa's resources was being decided by Western states and NGOs imposing their values on the continent. Only this time, the mix included many protectionists and animal rights groups that had recently appeared on the scene (Bonner, 1993).

The fallout from this battle over sustainable use versus preservation resulted in key proponents of sustainable use, such as John Hanks of WWF/International's African Program and Eugene Lapointe, then secretary general of CITES (Thomson, 2003), becoming casualties and losing their positions to preservationists. Countries such as Zimbabwe saw an increase in ivory poaching between 1989 and 1992 (Duffy, 2000) as a black market developed.

10.4.5 Does CITES Help Southern African Elephant Conservation?

Southern Africa (Botswana, Zimbabwe, Namibia and South Africa) had stable and growing populations of elephants to the point that annual culling was required to properly manage habitat and biodiversity. Good conservation and management

1996

had brought these herds back from the devastating slaughter at the turn of the 19th century. Elephant populations in Southern Africa are anything but endangered, with annual increments (growth rates) of from 5-7% resulting in a doubling in numbers every ten to 15 years respectively (Thomson, 2003), in spite of some organized poaching of elephant by governments to fund destabilization campaigns during the liberation wars (e.g., South Africa used poached ivory to support rebel groups such as National Union for the Total Independence of Angola /*União Nacional Para a Independência Total de Angola* (UNITA) in Angola and *Resistência National Moçambicana* (RENAMO) in Mozambique) (Potgieter, 1995; Duffy, 2000; Parker, 2004) (Table 10.5). As many as 100,000 elephants were allegedly killed by UNITA rebel forces for ivory that was transported out by South Africa (Potgieter, 1995).

Although the South African National Parks (SANparks) is custodian to more than 80% of the country's elephant population, the number in private possession is rapidly increasing. Cumming (2005) estimates current elephant populations in Southern Africa, in the above countries plus Mozambique, at 250,000 in 2000. It could grow to 400,000 by 2020 unless numbers are contained. As elephant populations have grown outside of parks and protected areas, their range has decreased, while inside their densities have increased, placing tremendous pressure on the remaining habitat. Due to humans and the increase in their livestock, wildlife today makes up only 10% of the large herbivore biomass in Southern Africa. Once densities exceed 1-2 elephants/km², woodland in low rainfall areas can be reduced to shrubland such as in the savanna woodlands (Cumming, 2005).

Table 10.5: Elephant populations Southern Africa, doubling every 10-15 Years

COUNTRY	YEAR	NUMBER	SOURCE
Zimbabwe: ³²⁷	1900	<4,000	David Cumming, WWF (<i>pers.comm.</i>)
	2000	84,000	Machena & Chimuti (<i>pers. comm.</i>)
Northern Botswana ³²⁸	1980	39,511	Spinage (1990)
	1990	54,600	DWNP Botswana (1991)
	1998	80,000	Gibson, Craig & Masogo (1998)
Zambia ³²⁹	1970s	200-250,000	Country-wide. AWI (2002)/Muchapondwa (2003)
	1973	100,000	Caughley & Goddard (1975), Luangwa Valley
	mid-80's	15,000	Child & Clayton (2002), Luangwa Valley
	2000	24,000/25,000	Country-wide. Figure Adapted from 1995 African Elephant Database, assuming a 5% growth rate per year & Hemley (1997)
Namibia	1900	300	Lindique (1995)
	1957	4,500	Mich De Jager (<i>pers. comm.</i>)
	1987	5,400	Hamunyela (<i>pers. comm.</i>)
	1995	7,700	Hamunyela (<i>pers. comm.</i>)
	1998	10,000	Hamunyela (<i>pers. comm.</i>)
South Africa	1920s	120	Hall-Martin (<i>pers. comm.</i>)
	1999	12,000	Hall-Martin (<i>pers. comm.</i>)
Note: Thomson (2003) & Cumming (2005) estimate a 5% annual growth rate with elephant populations doubling every 10/12-15 years. Source: DeGeorges In: African Advisory Board (2000).			

The fact is that the elephant populations are in need of culling in the Kruger National Park, South Africa, northern Botswana and northwest Zimbabwe in the Hwange National Park area (Thomson, 2003). Thomson is concerned that the

³²⁷ Two-hundred trophy hunted elephant/year bring in about US\$ 2 million/year to rural communities in Zimbabwe and another 127 elephants hunted in park estate land bring in US\$ 837,600/year to the Department of National Parks (Heath, *pers. comm.*). The Zimbabwe National Parks' estate in 2000 was estimated to have a dry season carrying capacity of 30,000 elephants (Machena & Chimuti, *pers. comm.*). The estimated population of 84,000 elephants for all of Zimbabwe was about 45,000 over the dry season carrying capacity (Machena & Chimuti, *pers. comm.*; Marawanyika, 2004). Child (1995) estimates a carrying capacity of only 23,000 elephants in protected areas (parks estate) and a maximum carrying capacity of about 50,000 for the entire country if properly managed (Child, 1995).

³²⁸ Approximately US\$ 900,000 is earned per year by rural communities in Botswana from 60 trophy hunted elephants. Money from elephant generates 53% of total community revenue from hunting (Peake *pers. comm.*). The management objective for northern Botswana is between 46,500 – 63,000 elephant (DWNP Botswana, 1991). Some say that the elephant population needs to be cut in half to protect vegetation, soil and biodiversity and afterwards culled annually in the 1000s (Thomson, *pers. comm.*).

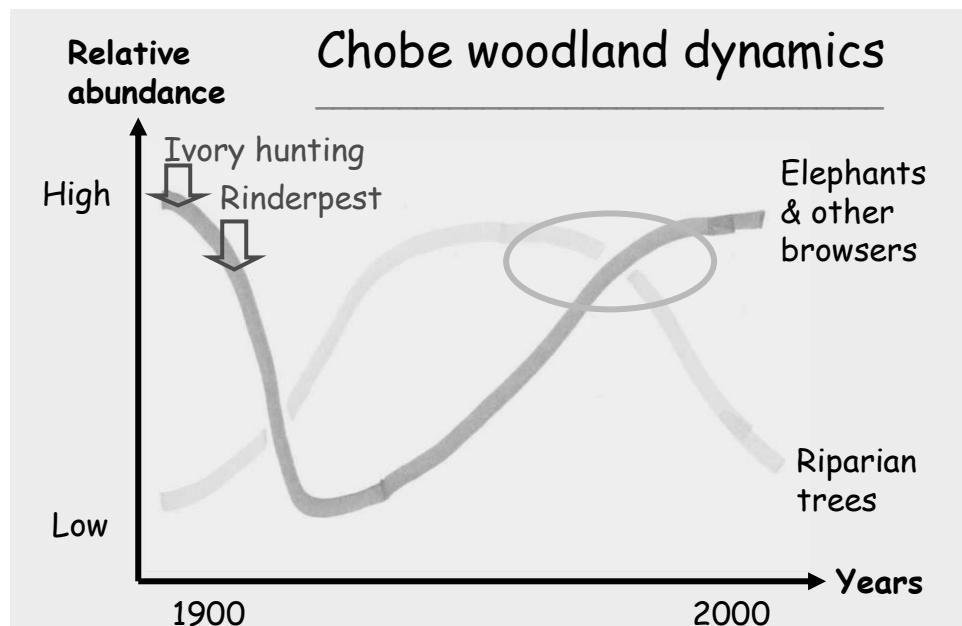
³²⁹ Zambia's elephant population today is said to be stable and increasing primarily due to community-based conservation programs tied to tourist safari hunting (Faddy, *pers. comm.*), though the analysis in Chapter 9 on CBNRM might make one question this to some degree. It appears that trophy elephant hunting reopened in 2005 after being closed for more than 20 years due to stable and likely growing populations of elephant in the Luangwa and Zambezi Valleys (SafariBwana, 2005).

Caprivi/Mahango Game Reserve complex in Namibia, the Chobe Game Reserve/Linyati/Savuti/Moremi/Okavango Delta Complex in Botswana and the Hwange and Gonarezhou National Parks in Zimbabwe have gone well beyond their ecological carrying capacity or habitat sustainability threshold into what is called the “stress period”. This stress period, as a result of “mismanagement” through a lack of elephant culling, is resulting in plant and animal species extinction and a loss of topsoil that make it difficult for vegetation to recover – at least for many generations.

Thomson argues the need for culling in Kruger National Park (KNP) to reduce the current elephant population from 11,000 to 3,000, especially around the Satara area (center of KNP) in order to protect the top tree canopy that is now just 6% (0.78 trees/ha) of what it was in 1960 (13 trees/ha) (Thomson, 2007). Others argue that the northern portion of KNP (e.g., Crook’s Corner) is closing up and that current elephant populations in this area are inadequate to hold back the evolution into forest (see Chapter 6, Section 6.1.4.4, Bush encroachment versus desertification). This argues for making decisions as whether to cull or not to cull on a landscape (particular associations of wildlife, vegetation, soils & topography) by landscape basis, as opposed to a park-wide basis. Possibly elephants around Satara need culling but those in the north can be left to increase as a means of achieving management objectives. Putting aside emotions, ultimately, the achievement of management objectives in a given landscape within a park or reserve by the park/reserve manager should be the driving force as to whether to cull or not.

Johan du Toit (*pers. comm.*) believes that northern Botswana, especially the Chobe area, is an open system with relatively low human populations offering ample room for elephants to disperse. He believes that there is no ecological justification for elephant culling, though there may be economic and/or political

reasons. du Toit (*pers. comm.*) believes that at the beginning of the 20th century, elephant populations were as high as they are today, while riparian woodlands were low. Over-hunting by humans of elephant and other browsers in the 20th century resulted in an increase in riparian woodlands. With strong conservation activities, elephant populations returned (Table 10.5) and riparian woodlands once again declined (Figure 10.4).



Source: Dynamics of acacia woodland from Lewin (1986), *Science*, 234:1071-1073 adapted with permission from American Association for the Advancement of Science (AAAS).

Figure 10.4: Cyclical relationship between elephant and riparian woodlands

Most people think of elephants as feeding on bushes and trees. In reality, they feed on grasses, bushes and trees, the degree being determined by the environment and time of year. Thus, they can compete with both livestock and other grazers (e.g., wildlife). Under grassland conditions, such as prevail at the Murchison Falls and Queen Elizabeth National Parks, Uganda, grass may form 60-90% of the diet year-round. In wooded savannas in Kenya, Uganda, Zambia, Zimbabwe and Tanzania, grass occupies between 40-70% of the diet during the wet season, but only 2-40% during the dry months. Bulls tend to select slightly higher portions of grass than cows. In the tropical lowland forest such as in

2000

Cameroon, Ghana, the Ivory Coast, Gabon, Congo Brazzaville and the DRC, grass is insignificant in the diet of the forest elephant (Owen-Smith, 1992).

During the rains, grasses are eaten, but as the dry season advances, the “environmental bottleneck”, and the ground is stripped of these grasses; trees are the next to go. First riverine and then non-riverine forests are destroyed. As the elephants move further and further from water in search of food, sometimes up to 20-30 km/day, calves are abandoned, starving to death and falling prey to lion and hyena. Eventually, the risk is that there will not be enough food and the elephant population will crash as described in Chapter 3 at Tsavo, Kenya (Thomson, 1997; 2003) (see Chapter 3, Section 3.9.1, Eco-Genocide and the Elephant People).

Thomson (2003) goes on to say that Sub-Saharan Africa’s growing human population is turning much of Africa’s protected areas into hard edges (i.e., surrounded by heavy concentrations of human populations). Once human settlements reach densities of 15.4 people/km² (40/mi.²), elephant cow herds vacate the area permanently and it ceases to be suitable elephant habitat. Hoare and du Toit (1999 *In:* Magome & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004) place this critical density at 15.6 people/km².³³⁰ As these human populations surround a park or protected area, they act as a “living fence”, containing the elephants, other than male crop raiders, within the park. Unable to disperse and with elephant populations doubling every ten to 15 years, unless their numbers are controlled, they can have serious impacts on habitat for themselves, other species and ultimately biodiversity. This is a problem across the subcontinent. Thomson is concerned that a majority of the parks and protected areas, due to elephant over-population and/or poaching, are in a crisis subcontinent-wide. Unfortunately, the

³³⁰ Wildlife management projects cease to be feasible when human densities exceed 20/km² (IUCN/SASUSG, 1997; Murphree, 1997) (Chapter 9, Section 9.7.6.4, CBNRM will not create a “middle class” in rural Africa, CAMPFIRE, Zimbabwe).

2001

Western lobbies (both the animal rights and governments) are against actions such as culling, threatening everything from campaigns against tourism to foreign aid cuts if African countries adopt culling as a management and economic tool. CITES, even when limited trade is allowed, places so many restrictions that it is also a disincentive to invest in sustainable management (Thomson, 2003).

In areas where elephants are compressed and natural systems still exist, Thomson (2003) raises concern over habitat degradation. He gives examples of certain species such as baobab whose life cycle is 5,000 years, riverine ebonies and other large hardwoods of 500 years, with most of Africa's large top tree canopies having a life cycle of more than 100 years. Thomson provides a list of 118 species of important top canopy trees whose genera/species are being or have been selectively eliminated from the above-mentioned Southern African parks due to a failure to control elephant populations. Given human population pressures, once a park/reserve is degraded from over-population of elephant/wildlife through a failure to implement "pro-active management", biodiversity is drastically reduced and the area loses its immediate economic and ecological value. How does anyone think they will keep out the land-hungry impoverished protein-starved masses? In some cases, some poaching – a form of unmanaged cropping – may actually be beneficial to habitat, as some claim for elephant poaching in the Luangwa Valley, Zambia in the 1980s.

Thomson (2003) is also concerned that due to the expansion of human beings outside of Africa's parks and reserves, turning them into "hard edges", the wildlife seed may no longer be available outside these "islands of biodiversity" that can at some point in time recolonize recovered habitat, as must have occurred in the past. Thus, unless habitat degradation from elephant and other species is controlled in Africa's parks and reserves, once Africa's last centers of biodiversity are severely degraded, recovery may become difficult and even these areas could be lost as a source of seed stock.

2002

Similarly, Parker (2004) argues that while commerce has caused some declines in wildlife populations (e.g., whaling and fishing), wildlife has been harvested for centuries and traded without destroying the resource. Like Thomson (2003), Parker (2004) believes that the real problem associated with the decline of African elephants is habitat loss from encroachment by ever growing human populations. This has been true as far back as expanding settlements by Europeans in Kenya, South Africa and the American West that eliminated elephant and other wildlife. This has been exasperated in Sub-Saharan Africa by the human population explosion of the 20th century. The laws were fine. CITES, as described, assumed that new laws were necessary, but thereby failed to address the real problem. Parker (2004) believes that there is a direct relationship between the decline in elephant populations, the annual 2-3% exponential increase in human populations in Sub-Saharan Africa, and the corresponding rate of uptake of new land. Loss of range is the critical issue (see Maasai Mara in Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya). Declining habitat makes recovery of a population irreversible. Ultimately, elephant populations declined from both legal [Problem Animal Control (PAC)] and illegal off-take along with reproductive failure brought about by disturbance, displacement and the severe stresses related to compression into even smaller ranges. Corruption's greatest influence was in how ivory was disposed and not so much in how it was acquired. Increasing human populations and loss of range determined that elephants must go regardless of

“whether the bullets that blew out their brains asunder were fired by colonial wardens who said they loved them or Amin’s soldiers who did not: what counted was their deaths” (Parker, 2004).

As discussed throughout this book, Parker (2004) believes that it is critical to address land and resource tenure, in which local communities can obtain the

2003

majority of benefits from elephant and other wildlife, if elephant habitat and thus elephant and other wildlife are to survive (see Chapter 9 in general and specifically Section 9.9.2, Land and Resource Ownership, Key to Success). All of this is independent of whether the price of ivory rises or falls (Parker, 2004).

Child, McKean, Kiss, Munthali, Jones, Mtsambiwa, Castley, Magome, Pangeti, Fearnhead, Johnson and Chilikusha (2004 *In:* Child, 2004) are concerned, especially with regards to elephants, that park managers and decision-makers are responding to the social aversion of an urbanized West to killing animals as a management tool (culling) to control populations, rather than dealing with shifts in ecological functions. Thus, the cost of protection and the failure of getting benefits to rural peripheral communities can be more costly to the environment from habitat destruction by both people and wildlife, than if management were allowed to occur that resulted in economic and ecological benefits. The risk is that the failure to undertake proactive management can result in over-stocking and long-term damage to ecological processes. Poverty knows no boundaries once people are in a survival mode, with the risks being habitat encroachment and accelerating poaching of elephant as a short-term resource. Child, *et al.* (2004 *In:* Child, 2004) believe that a shortcoming is obtaining adequate data from long-term ecological monitoring to quantitatively demonstrate the need for proactive management as wildlife becomes more confined in space and unable to disperse as parks and protected areas become surrounded by humans.

However, if a mistake is made in over-harvesting wildlife, most wildlife populations, including elephant, can recover in ten years, while once the habitat is destroyed, it can take 100s of years for the vegetation and 1000s of years for the soil to recover. Thus, preferences for non-consumptive uses and intangible uses that appear to be anthropogenic philosophical desires not to interfere with nature rather than any understanding of how an ecosystem functions, are often more

2004

consumptive than what is currently termed consumptive use (Child, 2004). Thus, ecosystem management becomes more important than single species management, and the adaptive management concept described in Chapter 9 allows for quick recovery if mistakes are made, much quicker than the precautionary principle espoused by the Western animal rights movement and researchers who would prefer to take no action, or study wildlife and ecosystems to extinction and/or irrecoverable ecological degradation.

Poachers probably helped do what the government was incapable of doing in the South Luangwa National Park, Zambia, by reducing the elephant population (Thomson, 2003; Rohwer, *pers. comm.*), whose damage to the environment could be viewed even in the early 1990s when the principal author undertook an evaluation of ADMADE.

10.4.5.1 Hwange National Park, Zimbabwe

Thomson (2003) gives an example of the build up of elephant in the 14,000 km² (5,000 mi²) Hwange National Park, Zimbabwe, despite their removal by government culling in the 1960s through 1987 (Table 10.6):

Table 10.6: Elephant population growth, Hwange National Park, Zimbabwe, 1900-2000

<u>Date</u>	<u>Elephant Population Hwange National Park</u>
1900	<100
1928	750
1960	6,000
2000	60,000

Source: Thomson (2003) with permission, Thomson.

Even by 1965, habitat damage by elephants was significant. He estimates a sustainable elephant population for this park to be at around 5,000. On Thomson's

2005

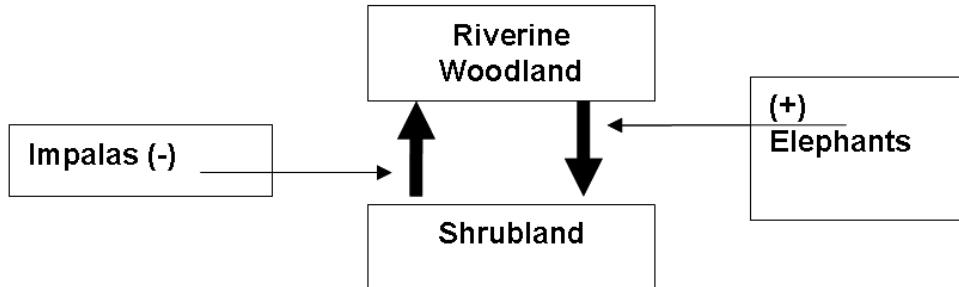
return to Hwange as the provincial game warden-in-charge in 1982, there were an estimated 21,728 elephants in the reserve and management decided to use culling to maintain the population at 14,000 or one elephant/km². The reduction target was never achieved. The independence of Zimbabwe in 1980 saw the loss of this expertise in the Wildlife and National Parks Department as significant numbers of white staff departed without training black game ranger culling teams.

In fact, in Zimbabwe, over a 17-year period from the late 1970s until the early 1980s, the national elephant population increased from 44,000 to 52,000 head despite the removal of 32,000 animals in a bid to reduce the alarming rate of habitat destruction (Child, 1993). Child (1995) states that between 1960 and 1991, the national elephant population of Zimbabwe, with a growth rate exceeding 5%, grew from about 30,000 to over 76,000 even though 46,775 elephants were removed by hunting and culling.

The 1989 CITES ban stopped the trade in ivory and skins that had been the source of money for such actions. Thomson calls this “Western first order thinking”, where Westerners impose their values and experience on other cultures and ecological systems without any attempt to understand the consequences. The Hwange National Park is a tragedy, which risks having nothing left in it but elephant and impala, which do well in degraded conditions feeding on regenerating tree seedlings, impala being what Thomson calls a “flip” agent, along with fire, in keeping the area in opened grasslands. This implies that once severe damage has occurred from elephant, impala numbers, possibly also other browsers, and fire may need to be controlled along with elephant to allow habitat and biodiversity recovery. du Toit also draws similar conclusions that the Chobe area next door to Hwange is in a state being maintained by impala (Figure 10.5).

A one-way transition:

- Elephants convert riverine woodland to shrubland
- Impalas (and other browsers) invade shrubland
- Seedling predation prevents the transition back



Source: Redrawn from du Toit, Moe & Rutina (2002) with permission, du Toit.

Figure 10.5: Role of elephant in moving from woodlands to savanna shrub and impala in keeping the ecosystem in shrub

A major difference in thinking between Thomson and du Toit is that du Toit as a researcher tends to favor “natural regulation”, letting nature play itself out. While Thomson, coming out of a park management background, strongly believes that given the artificial nature of most parks in the 21st century with little room for over-populated species to disperse, humans are obliged to actively manage for both biodiversity and economic reasons if these natural systems are to survive. Elephant has a great potential to provide income (trophy hunting, ivory and skin sales, along with transformed products and meat) for conservation and development, as well as to provide a major source of protein on a sustainable basis for Sub-Saharan Africa’s starving masses. Cumming (2005) estimates that

“a harvest of 5,000 elephants from a population of 200,000 elephants could generate US\$ 40 million a year – enough to protect and manage 200,000 km² of protected area at a rate of US\$ 200/km². National parks in Mozambique and Zimbabwe are currently operating on budgets as low as about US\$ 5 and US\$ 10/km², respectively”.

2007

In the late 1990s, the principal author sent his brother and nephew to visit the Victoria Falls with a side trip to Hwange. His brother's comment was that Hwange looked like a bombed-out war zone with the majority of trees leveled, elephants everywhere, a few herds of kudu and impala. He said that he would never come back to visit Hwange.

In most cases, there is a need for a drastic reduction in elephant populations and then an annual off-take equal to their annual incremental increase (e.g., 5-7%/year). The only economically viable solution, culling, must be considered. Translocation is possible, but it is very expensive, and countries like South Africa and Zimbabwe are finding that areas for translocation are limited and provide only short-term solutions. Elephant birth control to date has failed and even if it could work, why should elephant not be managed as an economic and protein resource for Sub-Saharan Africa. However, due to international pressure from Western governments and animal rights groups and roadblocks thrown up by CITES, culling is not taking place, which is resulting in de facto single species management for elephant, which devour up to 250 kg/day/elephant of vegetation. As they consume the last of Sub-Saharan Africa's biodiversity inside the parks and protected areas, over-populated humans and their livestock do the same outside these areas. Are Western ideas such as CITES and no culling so useful to Sub-Saharan Africa? How much better off would Sub-Saharan Africa, its people and their natural systems be if they were left alone to manage and market their resources?

In the opposite corner to Southern Africa's sustainable use philosophy is the Western urban-based animal rights movement epitomized by a statement in Leakey and Lewin (1995),

“To say no to culling is to recognize this species' (elephant) rights in a world in which we should coexist”.

2008

Cumming (2005) challenges this mentality and questions the morality of denying rural populations the right to improve their lives from living off elephant and elephant products (e.g., Chapter 9, Section 9.5.1, CAMPFIRE, Zimbabwe) while maintaining areas outside parks and protected areas in a natural state against the onslaught of agriculture. He also argues for parks and protected areas generating income from harvesting elephants so as to better manage these areas as centers for biodiversity. It is rare that the urbanized West thinks about these rural livelihood and management issues that will ultimately determine the future of elephant and other mega-fauna, along with their habitat. Destroying livelihoods and/or the ability of game/park departments to sustainably manage their natural resources will ultimately result in the demise of both the people and wildlife.

10.4.6 Elephant Down-listing to Appendix II in Southern Africa

It would take nearly a decade at the 1997 CITES COP 10 in Harare for Zimbabwe (export of 20,000 kg of ivory), Namibia (export of 13,800 kg) and Botswana (export of 25,300 kg) to have their elephant populations conditionally down-listed to Appendix II, allowing limited once off trade in ivory and some raw skin trade (CITES, 2005e). Each additional sale of ivory and/or skins, beyond typical hunting trophies as allowed by CITES, requires a proposal and approval at a COP meeting CITES (2005f).

COP 12 of 2002 saw South Africa's population of elephants down-listed to Appendix II with once off trade of stockpiled ivory being listed by early 2003 (CITES, 2005e).

Revenue from 1999 Sale of Elephant Ivory, Zimbabwe

The main characteristics of the 1999 auction, as agreed upon at CITES, was that the buyers would all come from a single country: Japan. The total value of the 19.9 metric tons of ivory sold was US\$ 2 million of which US\$ 520,195 went to 14 CAMPFIRE Rural District Councils (RDCs) (local government). Of this, US\$ 168,367 was dispersed to rural communities. The average price paid was US\$ 110/kg (Bond, 2001).

CITES trade controls on Southern African countries are restrictive and patronizing towards countries which have been leaders in conservation. The one exception to this is the one time world conservation leader, Zimbabwe, beginning with the politicization of land reform in 2000 that has had devastating impacts on wildlife; especially on game ranches (see Chapter 5. Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife).

10.4.6.1 Botswana

By COP 12 in 2002, Botswana was allowed trade in (CITES, 2005e):

1. Hunting trophies for non-commercial purposes – tusks from 210 trophy hunted elephant (CITES, 2005f);
2. Live animals for in-situ conservation programs;
3. Hides;³³¹

³³¹ Caldwell (2005a) believes that hides mean tanned and untanned. The author was always told this meant untanned raw hides. According to Heath (2005), from a practical standpoint and to meet international veterinary restrictions, elephant hide is partially “blue tanned”, the color of a hide coming out of chromium tanning solution, making it 17-25% lighter than a salted hide and much cheaper to ship, while assuring that disease transmission cannot be a problem as a result of this preliminary treatment process.

2010

4. Leather goods for non-commercial purposes;
5. Registered raw ivory (whole tusks and pieces only from registered government-owned stocks, originating in Botswana), excluding seized ivory and ivory of unknown origin, to trading partners verified by the secretariat, in consultation with the standing committee, to ensure that the imported ivory will not be re-exported and will be managed in accordance with all requirements of Resolution Conf. 10.10 (Rev.) concerning domestic manufacturing and trade and not before May 2004 and before the secretariat has verified the prospective importing countries and the Monitoring of Illegally Killed Elephants (MIKE) program has reported to the secretariat on the baseline information (e.g. elephant population numbers, incidence of illegal killing); and
6. Proceeds spent on elephant conservation and community conservation and development programs within or adjacent to the elephant range.

“A maximum amount of 20,000 kg of ivory may be traded, and dispatched in a single shipment under strict supervision of the Secretariat...”. (CITES, 2005e). At CITES COP 13 of October 2004, it was determined that the six conditions of COP 12 applied to trade, as well as the quantity of ivory that could be sold (CITES, 2005e). This was still the case in 2005 (CITES, 2005e). In addition to trophy hunted tusks, to date the following has been exported from Botswana (Table 10.7):

Table 10.7: Export of elephant parts, 1998-2004, Botswana							
PRODUCT	UNIT	1998	1999	2000	2001	2002	2003
Tusks	kg	0	17,170	45	0	0	0
Skin Pieces		0	0	4	0	0	2
Leather Products				1			0

Source: CITES (2005g) & UNEP-WCMC (2005b) with permission, Jon Hutton Director, United Nations Environment Program- World Conservation Monitoring Center (UNEP-WCMC).

2011

To date only one major ivory sale has taken place for Botswana, Namibia, South Africa and Zimbabwe with a second sale being planned but not yet having taken place as of June 2005, the second sale excluding Zimbabwe (Botha, 2005).

10.4.6.2 Namibia

By COP 12 in 2002, Namibia was allowed trade in elephant ivory and parts with basically the same conditions as Botswana but a maximum amount of 10,000 kg of ivory in a single shipment (CITES, 2005e) and tusks from 90 trophy hunted elephant (CITES, 2005f). In addition to trophy hunted tusks, to date the following has been exported from Namibia (Table 10.8):

Table 10.8: Export of elephant parts, 1998-2004, Namibia

PRODUCT	UNIT	1998	1999	2000	2001	2002	2003	2004
Tusks	kg	0	12,366	0	0	0	0	0
Skin Pieces		0	0	0	0	0	471	0

Source: CITES (2005g) & UNEP-WCMC (2005b) with permission, Jon Hutton Director, UNEP-WCMC.

At CITES COP 13, it was determined that the six conditions of COP 12 as noted for Botswana applied to trade for Namibia with one exception; trade in leather goods could be for non-commercial and for first time commercial purposes as well as for the first time trade in elephant hair for commercial and non-commercial purposes. Trade was also allowed in *ekipas*³³², incorporated in finished jewelry for non-commercial purposes. The once off export remained at 10,000 kg not to be sold before May 2004 (CITES, 2005e). Based on Table 10.8, the sale had not yet taken place in 2004. The same amount of ivory is repeated for a once off sale in 2005 as were the other six conditions, so it is believed that the stockpile sale was carried over (CITES, 2005e) as per Botha (2005).

³³² Traditional ornament worn by women of the Owambo tribe

10.4.6.3 South Africa

By COP 11, South Africa could trade in elephant hides and leather goods. By COP 12 in 2002, South Africa was allowed to trade in elephant ivory and parts with the same conditions as Botswana but a maximum amount of 30,000 kg of ivory in a single shipment (CITES, 2005e) and ivory/parts from 100 trophy hunted elephant (2005f). By COP 12, leather goods were stipulated only for non-commercial trade. In addition to trophy hunted tusks, to date the following has been exported from South Africa (Table 10.9):

At CITES COP 13, it was determined that the six conditions of COP 12 applied to trade with one exception; trade in leather goods could be for non-commercial and for first time - commercial purposes. The once off export remained at 30,000 kg and only ivory originating from the Kruger National Park (CITES, 2005e). This was still the case in 2005 (CITES, 2005e). Based on trade statistics (Table 10.9), it appears that the once off sale of stockpiled ivory had not taken place and was carried over into 2005 as per Botha (2005).

Table 10.9: Export of elephant parts, 1998-2004, South Africa

PRODUCT	UNIT	1998	1999	2000	2001	2002	2003	2004
Tusks	kg	0	0	45	0	0	0	0
Tusks		5	3	0	0	0	2	0
Skins		0	0	0	6	188	12	0
Skins	M ²	0	0	0	0	19,734	0	0
Skins	Ft ²	0	0	0	3,610	84,695	12,025	1,018
Skins	M	0	0	0	0	0	4,559	0
Skins	Pieces	0	0	30	2	251	697	0
Skin Pieces	M ²	0	0	0	0	262	25	0
Skin Pieces	Ft ²	0	0	0	2,600	689	659	0
Leather Products (s)		0	0	5	0	146	56	0
Leather Products (l)		0	0	0	0	205	30	0

Source: CITES (2005g) & UNEP-WCMC (2005b) with permission, Jon Hutton
Director, UNEP-WCMC. (s) = small, (l) = large

10.4.6.4 Zimbabwe

By COP 11 in 2000, Zimbabwe could trade as per Botswana but had no right to sell ivory stockpiles as had been allowed at COP 10 in 1997 (up to 20,000 kg once off that took place in 1999) (CITES, 2005e). COP 11 in 2000 allowed Zimbabwe to trade in elephant parts, but indicated no sale of stockpiles (CITES, 2005e). By COP 12 in 2002, (as indicated in early 2003, 13/02/03) and COP 13 of 2004, Zimbabwe is not listed as having the right to trade in any elephant parts (CITES, 2005e). According to Caldwell (2005a), the Zimbabwe listing for July 7, 2000 in CITES (2005e) still allows Zimbabwe to export live animals and continue with the export of tusks from 500 trophy elephant (CITES, 2005f), which as a result of CITES Resolution 911 is considered non-commercial, and to export hides and transformed ivory/leather for non-commercial purposes with all other trade being regulated as if the elephant were on CITES Appendix I. To date the following has been exported from Zimbabwe (Table 10.10).

Table 10.10: Export of elephant parts, 1998-2004, Zimbabwe

PRODUCT	UNIT	1998	1999	2000	2001	2002	2003	2004
Tusks	kg	350	95,330	6,508	0	0	27	0
Tusks		200	529	78	4	341	2	0
Skins		3,483	6,273	3,802	4,112	1,196	2	0
Skins	M ²	0	1,067	7	0	48	0	0
Skins	Ft ²	0	0	0	0	0	2,474	0
Skins	M	0	6	0	0	0	0	0
Skins	Pieces	4,799	2,358	12,298	911	536	5	0
Skin Pieces	M ²	0	0	0	0	0	61	0
Leather Products (s)		4	33	175	0	33	18	0
Leather Products (s)	Pairs	0	0	0	0	1	3	0
Leather Products (l)		35	25	107	38	46	81	0

Source: CITES (2005g) UNEP-WCMC (2005b) with permission, Jon Hutton Director, UNEP-WCMC. (s) = small, (l) = large

2014

There is a large difference between the 19,900 kg sold in 1999 as indicated by Bond (2001) and as provided for by CITES COP 10 compared to that found in Table 10.10 extracted from UNEP-WCMC (2005b).

The UNEP-WCMC CITES database manager (Caldwell, 2005b) indicated that the figure of 95,330 kg is in error,

“I have looked more closely at the Zimbabwe annual report for 1999 and it appears that the erroneous record for 74,910 kg (95,330-74,910 = 20,420 kg, similar to the 20,000 kg export allowed by COP 10) was for either 7 tusks or, more likely, 7 carvings...I will try to follow these up with the Management Authority of Zimbabwe but don't hold out much hope of getting a response. Their report is always awash with typographic errors, many of which I can sort out by cross checking with data from the importing countries” (Caldwell, 2005b).

“Zimbabwe (ZW) did not report the commercial export of the stockpiled ivory while the Japanese did report the import. Thus the total gross export figure of 95,330 kg includes both the erroneous record of export to South Africa and the correctly reported Japanese import record...I suspect the (South African) permit was cancelled and replaced subsequently” (Caldwell, 2005c).

Caldwell (2005d) goes on to explain that

“a record reported by ZW of over 70t (tons) going to South Africa - this was an error. There was a record of 20t + going to Japan, reported by Japan - this was the one-off sale, not reported by ZW. The gross/net program added these together to produce the 93t + figure. Hopefully I've amended the database to reflect the true situation in future outputs”.

Parker (2004) states that CITES statistics were flawed, with 95% of animal exports reported not tallying with import statistics, what he calls “a total monitoring failure”.

2015

Likewise, Botha (2005) of the Department of Environmental Affairs and Tourism, South Africa, has the following to say,

“Zimbabwe had permission to sell 20 tons of ivory and that accounts for the 19,900 kg. I cannot make out where the 93 tons are coming from. One must bear in mind that the WCMC figures will represent all ivory, that is bracelets etc, but for that to come to 93 tons is a bit much. I will believe the figures from Bond as the real figures from Zimbabwe. There was only one sale and as a matter of fact Zimbabwe has not been included in the second sale it is only South Africa, Botswana and Namibia and this sale has not taken place yet”.

In addition, what the UNEP-WCMC trade database does not appear to show in addition to sport hunted trophies is the “non-commercial trade” that flourishes in Zimbabwe. This consists primarily of *hanko* (oriental seals) and chopsticks amounting to 5-6 tons of elephant ivory/year. Non-commercial trade in this case is considered an export of five items or less of a value of US\$ 500 or less. CITES export permits are issued by the Zimbabwean authorities for each shipment but would not be recorded as commercial trade (Heath, *pers. comm.*). Using this loop hole, Johnson (2006) estimated the export to China over a seven month period of 30 tons of ivory representing 2,250 Zimbabwean elephants (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife - Impacts of Land Reform on Wildlife and the Environment).

It is unclear as to whether this definition applies to other countries. However, once again as per Parker (2004) concerning the flawed database, Caldwell (2005d) gives one the impression that this gross trade data should include trophy hunted tusks and other non-commercial trade. It is clear from Tables 10.6-10.9 that trophy hunted tusks are not included between 2000-2004, which makes one wonder about the accuracy of any of this data.

2016

Courtney Boots, an Example Close to Home, CITES as an Impediment to Free-trade

Courtney Boots, based in Bulawayo, Zimbabwe, makes one of the finest outdoor, casual and hunting lines of boots in the world from game skins including elephant. Zimbabwe has a CITES quota for elephant skins. Elephant skins are said to be worth more than ivory. Zimbabwe can export untransformed elephant hides to America, where Americans turn them into cowboy boots and other products, getting the added value of transformation in America. Since Zimbabwe has “no permission” from CITES to export products from transformed elephant hides for commercial purposes, Courtney Boots is restricted to small quantity non-commercial sales as opposed to the vast international market. According to Heath (2005), in the case of the United States, it has taken “stricter domestic measures” and only allows trophy hunted elephant ivory and parts into the country, but no other form of non-commercial trade in elephant ivory/parts. Only raw “blue tanned” hides are sold to the United States from Zimbabwe. It would seem that this flies in the face of the New Partnership for Africa’s Development (NEPAD). Each country has different export guidelines and must make individual requests to CITES. It is time that Zimbabwe, like Namibia and South Africa at COP 13 in 2004, requests quotas for the export of transformed commercial leather products. The precedent for the first time has been set. Of course this means nothing if the importing country, as the United States, disallows importation.

10.5 RHINO, TRADE OR TRADE CONTROL, WHAT'S BEST FOR CONSERVATION?

The IUCN Southern Africa Sustainable Use Specialist Group argues that nowhere in Southern Africa has giving value to natural resources resulted in their being mined to extinction. In fact, they argue,

“...the black rhino - has suffered a catastrophic decline in the region (Mozambique, Zambia and Zimbabwe) but this has come about because no legal financial value was attached to the species, the special protection afforded to the species through legislation effectively removed the incentives for local communities to conserve it...” (IUSN/SASUSG, 1997).

At about the same time as an ivory market developed, a demand developed for rhino horn for dagger handles in the Middle East and medicine in Asia. Medicinally, rhino horn is believed to have value as a blood thinner and in fever reduction (febrifuge), but not as an aphrodisiac as often purported (Duffy, 2000), fulfilling the role that aspirin plays in Western medicine (Parker, 2004). Both black and white rhino are listed on CITES Appendix I, except the South African white rhino population which is Appendix II (SCI, 1996) and is legally trophy hunted. The trade in rhino horn was banned through CITES in 1977, while the world rhino population between 1970 and 1990 declined by 80% (Duffy, 2000). Between 1975 and 1980, the black-market post-ban value of wildlife increased 20 times linked to illegal trading syndicates, which CITES unintentionally helped to create (Duffy, 2000). The black rhino was protected to near extinction, the trade ban failing, while South Africa brought the southern white rhino back from near extinction by giving it value through trophy hunting (Table 10.11).

Table 10.11: White rhino (*Ceratotherium simum*) population recovery – South Africa

YEAR	NUMBER	SOURCE
1895	20	Emslie & Brooks (1999)
1991	5,820	Emslie (2007)
1993	6,784	Emslie (2007)
1995	7,563	Emslie (2007)
1996	8,400	Emslie & Brooks (1999)
1997	8,466	Emslie (2007)
1999	10,405	Emslie (2007)
2001	11,670	Emslie (2007)
2003	11,350	Emslie (2007)
2005	14,540	Emslie (2007)

From October 1, 1998 to November 31, 1999, 43 hunted/year in South Africa, generating US\$ 1.1 million/year in trophy fees alone (Hoogkamer, *pers. comm.*). About 20% (one-fifth) are on private land.

Table prepared by principal author with permission Emslie and International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU).

The future of the black rhino will depend on collaboration between nature conservation agencies, private farmers and trophy hunters. In 2005, the first black rhino was sold to a safari operator for about \$US 220,000 hunted in Pilanesberg Park, Northwest Province, South Africa (Hoogkamer, *pers. comm.*) and a complete hunt was sold for US\$ 150,000 in Mpumalanga Province, South Africa (Hunting Report, 2005). In 2006, a black rhino hunt is selling for about US\$ 100,000 (Hoogkamer, *pers. comm.*). Duffy (2000) estimated the value as US\$ 250,000/trophy hunted black rhino. About 74% are found on state land, 15.1% custodianship on private land and 2.4% in private ownership. The drop in 1995 is due to a change in statistics – no more estimates taken – only actual census data. About 40% of the current population is found in South Africa (Emslie & Brooks, 1999 *In: African Advisory Board, 2000*) (Table 10.12).

**Table 10.12: Decline in black rhino (*Diceros bicornis*) populations,
Sub-Saharan Africa**

YEAR	NUMBER	SOURCE
1960	100,000	Emslie & Brooks (1999)
1970	63,500	Emslie & Brooks (1999)
1980	14,785	Emslie & Brooks (1999)
1984	8,800	Emslie & Brooks (1999)
1987	3,665	Emslie & Brooks (1999)
1991	3,450	Emslie & Brooks (1999)
1991	2,475	Emslie (2007)
1992	2,475	Emslie & Brooks (1999)
1993	2,550	Emslie (2007)
1993/94	2,550	Emslie & Brooks (1999)
1995	2,408	Emslie (2007)
1995	2,410	Emslie & Brooks (1999)
1997	2599	Emslie (2007)
1997	2,600	Emslie & Brooks (1999)
1999	2,704	Emslie (2007)
2001	3,100	Emslie (2007)
2003	3,610	Emslie (2007)
2005	3,726	Emslie (2007)

Table prepared by principal author with permission, Emslie and International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU).

The virtual elimination of black rhino from much of their range in Africa is due to the high value of their horn. Zimbabwean populations were not affected until recently, since poaching spread south from the Horn of Africa, and because in Zimbabwe they were a hard target first protected by civil war and then by a high level of law enforcement (Duffy, 2000). Rodgers (2005 *In:* Baldus, 2005) gives the example of the Selous Game Reserve (SGR) black rhino population of over 3,000 driven to near extinction from the poaching of the 1980s. See Chapter 9, Section 9.6.1.1, Zambia for a brief discussion of black rhino extermination in Zambia.

As with elephant, Parker (2004) believes that the decline in black rhino can also be linked to loss of range from growing human populations. In East Africa, black rhino lost 82% of its range between 1925 and 1970, the greater part of the loss

happening before 1950. The decline in rhino moved south regardless of the kind of governance and regardless of the price of horn.

Kingdon (1971 *In:* Parker, 2004) demonstrates that trade does not appear to impact wildlife where the range is intact, nor is there necessarily a direct link between trade and declines in a species. Kingdon (1971 *In:* Parker, 2004) examined changes in distribution of 30 large mammal species in Sub-Saharan Africa, all of which had declined through the half century preceding 1970. There was not necessarily a relationship between extent of range loss and value of trophy. The Ugandan kob was No. 1, having lost 89% of its range and corresponding numbers,³³³ with little value for trophy and hide, except for meat. Leopards lost less of their range than all but two species despite the value of their pelts. In 1987, CITES consultants noted that the trade in leopard skins, ranking with elephants and rhino in value, had a negligible impact on leopard numbers (Martin & de Meulenaer 1987- *In:* Parker, 2004). Wildlife such as kudu, oryx and gerenuk that live in dry areas, where they can go for a number of months without free water, lost less of their range than those species living in areas suitable for agriculture. In other words, Parker (2004) argues that the decline in elephants and black rhinos and other large mammals has everything to do with human increase, displacement by people and ultimately loss of range and very little to do with the value of their products. These declines have been going on throughout the past century and are not just a post-1970 phenomenon. Parker (2004) believes placing all the blame on African governance to be racial and dishonest. Parker (2004) also believes that CITES is a waste of money and that it fails to address significant issues. The “good cops bad poacher” story makes for first-class fundraising by Western NGOs while discussing over-population, poverty and disenfranchisement does little to entice Western audiences to open their purses.

³³³ Elephants and rhinos were second and third, respectively in loss of range (Parker, 2004).

In 1983, CITES declared a complete ban on trading in rhino parts and derivatives. Illegal trade flourished. The Department of Wildlife and National Parks in Zimbabwe increased its anti-poaching levels within the limitations of manpower and finance. Rhino were also relocated into safe areas within the parks and wildlife estate. Poaching suddenly escalated in the Zambezi Valley. Rhino dehorning failed since “poachers” were unable to determine if a rhino was dehorned in thick bush and the Far East was counting on the extinction of the black rhino driving up the value of stockpiles (Duffy, 2000). By mid-1985, the prime minister, with support from President Robert Mugabe, authorized the shooting of poachers in self-defense (Child, 1995), Operation Stronghold and eventually Operation Save Our Heritage in 1993, even providing rewards for each poacher shot or caught. Between 1984 and 1993, 170 poachers were killed, the majority being Zambian. In America and Europe, the killing of “poachers” was presented as a global good (Duffy, 2000). Human rights groups condemned this policy of shooting people without proving their guilt while protecting the killers through the 1989 Protection of Wild Life (Indemnity) Act that exonerated game guards who shot so-called poachers. This caused strained relations between Zambia and Zimbabwe, though President Kaunda eventually backed this war on poachers in an effort to maintain relations with Zimbabwe. It was estimated that the cost of protecting the black rhino was US\$ 400/km² while by 1988 as the result of structural adjustment (SAP) there was only US\$ 24/km² available for this purpose (Duffy, 2000).

Duffy (2000) attributes the increase in poaching of Zimbabwean black rhino to: 1) increase in supply of weapons as a by-product of civil wars, liberation wars and superpower competition, 2) a major economic decline in neighboring Zambia, from where most of the poachers initially came, due to the World Bank/IMF structural adjustment policies (SAPs) (see Chapter 12, Section 12.7.1.12, Impacts

of structural adjustment on the wildlife and parks estate in Zimbabwe), 3) increased complicity and support of poachers by Zimbabwean nationals and 4) a triangular network of politicians, business people and diplomats who helped move the black rhino horn and eventually elephant ivory, once the black rhino had been shot to near extinction. Law enforcement was tackling the effect rather than the cause of the problem; the high price of horn on the illegal market was given a monopoly by the prohibition of legal trade. The approach, based on protectionist philosophies that depended on persuading people to shut down the lucrative trade in rhino products, was misguided (Child, 1995). By 1992, Zimbabwe had an estimated 240-350 black rhino out of what had been the largest remaining population in Africa of an estimated population of 3,000. CITES had failed to protect black rhino across the continent, as states lost their ability to derive income from regulated trade while poachers, middlemen and dealers captured the economic value in a thriving black market (Duffy, 2000). Just as importantly, on the ground “poachers”, mainly rural poor, became the victims of the real culprits - middlemen (politicians, businessmen, game department officials and diplomats), who were rarely caught, protected by their status in society and who took advantage of poverty in the region, exasperated by the structural adjustment policies (SAPs) imposed on the region (Duffy, 2000). Likewise, Parker (2004) feels that innocent men were being shot as they ran away, while the real culprit behind the scene in black rhino poaching was South Africa. As noted, the contraband trade in ivory and rhino horn in Southern Africa in the 1980s/90s is alleged to be largely by South Africa, often in collaboration with ex-Rhodesian Selous Scouts. This was both for personal gain and to help fund many of its wars against liberation and communism, including rebel groups such as National Union for the Total Independence of Angola /*União Nacional Para a Independência Total de Angola* (UNITA) in Angola and *Resistência Nacional Moçambicana* (RENAMO) in Mozambique (Potgieter, 1995; Meadows, 1996; Parker, 2004).

2023

The black rhino were eventually moved to private conservancies in Zimbabwe, when the state was unable to protect them and were beginning to recover. Zimbabwe had the world's largest single remaining herd of black rhino, numbering about 500. However, since the radical land reform of 2000 and associated economic collapse, it was reduced to 200 from poaching by 2004 (Unti, 2007) and by a further 80 from poaching in the first three months of 2007 (VOA, 2007) (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife). This decline cannot be attributed to bad conservation, or the need for more trade controls that would not stop this plunder, but the destruction of a country by greed and a lust for power of Robert Mugabe and his cronies in the Zimbabwe African National Union – Patriotic Front (ZANU-PF).

It is interesting that animal rights and their spokesman Richard Leakey (Leakey & Morell, 2002) believe that banning the trade in elephant ivory will protect the elephant, when he admits that,

“more rare than elephant, rhino horn has been banned as an item of international trade for some years but fetches very high prices on the black market. A single rhino horn can attract several thousand dollars at the first point of sale and by the time it reaches Taiwan or China can be worth almost 10 times that”.

It can be argued that on one hand CITES helped condemn the black rhino to near extinction, while careful conservation efforts by the South African government, landowners and sport hunters helped save the white rhino. Which route would you chose, trade or preservation? The answer is self-evident in the figures provided above.

10.6 CITES RESOLUTION 2.11

In 1979, the CITES parties adopted Resolution Conf. 2.11, dealing with the international shipment of sport hunting trophies of species listed on Appendix I. According to the sponsors, the purpose of the resolution was to correct the “differing procedures (for) the granting of permits for the trade in hunting trophies of Appendix I species”. Instead, it caused further confusion, expense and delay (CITES, 1994a).

Between 1979 and 1994, “tourist safari hunting” and the taking of a low number of trophies of Appendix I species became accepted as an important conservation measure to help assure the survival of the species through income from hunting being poured back into community development schemes, anti-poaching and habitat management.

However, some countries used Resolution 2.11 as a rationale to refuse CITES approved trophy-hunting quotas for importation into their countries.

The USA’s reluctance to issue trophy import permits ultimately lead to litigation with the tourist hunting (sport hunting) industry. In turn, this led to an amendment of Resolution 2.11 at COP 9 in Fort Lauderdale, Florida, in 1994 to protect the emerging sustainable use conservation programs of the independent African states from protectionists’ political influence in the administration of the Endangered Species Act (ESA) and of CITES authorities in the USA. The U.S. Secretary of Interior even admitted in his address to the CITES parties that the USA was being accused of undermining the means and funding of the African states program through excessive precautionary restraints on trophy imports. Under revised Resolution 2.11, trophies from sport hunting are considered as non-commercial trade. The sovereignty of a state is respected, the parties assuming

that a requested trophy-hunting quota by the exporting country is “non-detrimental” to the species (Jackson, *pers. comm.*). To quote the CITES Resolution: Amended paragraph (c) of Resolution Conf. 2.11 reads as follows (CITES, 1994b; 1994c):

“CONSIDERING the need of uniform interpretation of the Convention with regard to hunting trophies;

...b) in order to achieve the envisaged complementary control of trade in Appendix-I species by the importing and exporting countries in the most effective and comprehensive manner, the Scientific Authority of the importing country accept the finding of the Scientific Authority of the exporting country that the exportation of the hunting trophy is not detrimental to the survival of the species, unless there are scientific or management data to indicate otherwise...”

Thus, the role of the exporting country is to assess the impact of the removal of the animal from the country’s wild population. The importing country’s role is to consider the purpose or use of the importation into the importing country (CITES, 1994a).

“The resolution was amended at COP 9 to reflect the original intent of the parties when CITES was adopted. The biological non-detiment determination of export nations is generally to be accepted because 1. they are in the best position to know and to make that determination, 2. respect of sovereignty, 3. importing nations are to make a different though complementary determination that relates to the ultimate use and destination, i.e., the ultimate purpose of the import which they are in the best position to make, 4. to avoid burdensome and arbitrary stricter domestic measures of importing states, 5. because range nations, according to the CITES preamble are the owners of the species and are preferred to manage their own species, 6. that was the original intent, i.e., any other interpretation is *ultra-vires*” (Jackson, 2006a).

10.7 ENDANGERED SPECIES ACT OF THE USA, IMPEDIMENT TO AFRICAN CONSERVATION

The U.S. Congress passed the Endangered Species Preservation Act in 1966, which allowed listing of only native animal species as endangered. The Endangered Species Conservation Act of 1969 provided additional protection to species in danger of “worldwide extinction”. Import of such species was prohibited, as was their subsequent sale within the U.S. This act called for an international ministerial meeting to adopt a convention on the conservation of endangered species; CITES adopted in 1973. The Endangered Species Act (ESA) of 1973 combined and considerably strengthened the provisions of its predecessors. Its principal provisions follow (USFWS, 2003):

- U.S. and foreign species lists were combined, with uniform provisions applied to both (section 4);
- Categories of “endangered” and “threatened” were defined (section 3);
- Plants and all classes of invertebrates were eligible for protection, as they are under CITES (section 3);
- All federal agencies were required to undertake programs for the conservation of endangered and threatened species and were prohibited from authorizing, funding or carrying out any action that would jeopardize a listed species or destroy or modify its “critical habitat” (section 7);
- Broad taking prohibitions were applied to all endangered animal species, which could apply to threatened animals by special regulation (section 9);
- Matching federal funds became available for states with cooperative agreements (section 6);
- Authority was provided to acquire land for listed animals and for plants listed under CITES (section 5); and
- U.S. implementation of CITES was provided (section 8).

Significant amendments have been enacted in 1978, 1982 and 1988, while the overall framework of the 1973 act has remained essentially unchanged (USFWS, 2003). Under the ESA:

- **Endangered** applies to any species considered to be in danger of becoming extinct throughout all or a significant portion of its range; and
- **Threatened** refers to any species that is likely to become an endangered species throughout all or a significant portion of its range within the near future.

In order for a species to be listed, there must be enough information to support the proposed listing of that species based on its biological status and on the severity of threat placed on its existence. Species can only be determined as endangered or threatened by one or more of the factors listed below:

1. If there is present or threatened destruction and alteration of its habitat;
2. If there is an over-utilization for commercial, educational and/or scientific purposes;
3. If there is a presence of disease or predation;
4. If there are not enough regulatory mechanisms existing today to protect the species; and
5. If there are any other natural or man-made factors that may be or currently affecting its continued existence.

When there is not enough biological information on a species for the Fish and Wildlife Service to issue a classification of endangered and threatened, the species is referred to as a "candidate species" (FLMNH, 2003). The ESA, like CITES, has a reputation for listings, often made based on political rather than scientific bases.

For instance, in the early 1970s, all spotted cats were listed as “endangered” by the USFWS on the basis of one NGO’s petition that they were listed on Appendix I of CITES. It takes more information to delist a species from the ESA than to list it. For instance, recent attempts in 2002/2003 to down-list the cheetah population in Namibia failed because of inadequate population data and yet more is known about the status of the Namibian cheetah population today than when it was listed on the ESA (Jackson, 2003). Jackson has argued that the original listing of the Namibian cheetah as “endangered” in the ESA (USFWS, 1999) was in error, the cheetah from Namibia being lumped with other cheetah populations on the supposition that there was excessive commercial trade in skins, but with little or no evidence. Jackson (*pers. comm.*) argues that this is “fallacy of composition or division”, recognized as invalid reasoning for 2,000 years and therefore unscientific. It is invalid to assume that what applies to a group as a whole is equally true of all members of a group, i.e., that the Namibian cheetah were at the same risk as cheetah elsewhere.

On August 28, 2003, the USFWS published a proposed change in ESA policy to allow, under certain conditions that are beneficial to conservation, the importation of trophies of foreign species listed within the act as “endangered” (see 159 FR 49512). If adopted, the U.S. will allow the import of trophies of “endangered” species taken in regulated hunts in foreign countries (never adopted). This proposal is supposed to encourage foreign conservation programs that enhance the hunted species. The ESA and regulations to implement it have always authorized importation of trophies of animals listed as “endangered” if the hunting “enhances” the survival of the species. Over the 30-year history of the ESA (enacted 1973), a practice has evolved against such permits. No trophy import permit has ever been issued for any “endangered”³³⁴ species on the ESA hunted in

³³⁴ Note: Note: Elephant, and Leopard (in the wild, south of, and including, the following countries: Gabon, Congo, Zaire, Uganda, Kenya) are “Threatened” under the ESA (1999), the next category down. Leopard north of this line, “Endangered” under the ESA.

the wild. This includes cheetah in Namibia, jaguar in Central/South America, the Argali sheep in China and the Markhor sheep in Asia (Hutton, 2003). The one exception has been the “farmed” but “endangered” in the ESA bontebok (*Damaliscus dorcas dorcas*) from South Africa where import permits for hunted bontebok trophies are available from certified South African ranches on a U.S. approved list (SCI, 1996). The bontebok survival has been advanced by the managed captive breeding, culling of surplus males on game ranches and related revenue from tourist hunting (sport hunting) by Americans (WCF, 2005). As this chapter was prepared, the animal rights were mounting extreme opposition to the change in this policy. Some say that the USFWS fears a major lawsuit by the animal rights groups the day it lets a hunted trophy in of a species taken from the wild on the ESA endangered list.

10.7.1 ESA as an Impediment to Cheetah and Black-Faced Impala Conservation in Namibia

One example is Namibia’s cheetah (*Acinonyx jubatus*), which is classified as “endangered” in the ESA (USFWS, 1999), cheetah from all over Africa being thrown into one barrel. In Namibia, the cheetah is anything but endangered (Table 10.13) and found on game/cattle farms where it kills almost daily.

Table 10.13: Cheetah populations, Namibia

DATE	NUMBER	SOURCE
1900	??????	Grellmann, <i>pers. comm.</i>
1999	1,580 – 5,040	MET (1999)
2004	3,318 – 5,775	Hanssen & Stander (2004)

Source: DeGeorges *In: African Advisory Board* (2000).

2030

Establishment of cattle ranches in Namibia resulted in an elimination of lion and hyena in the 1930s/40s. These predators traditionally suppressed the cheetah population by out-competing the cheetah for food and killing its young. By the 1970s, the cheetah population had increased to the point where ranchers considered it unwanted vermin (Grellmann, *pers. comm.*).

Although Namibia has a CITES export quota of 150/year (CITES, 2005b), currently only about 60 trophy hunted cheetah/year are exported (Grellmann, *pers. comm.*) mostly to Europe. Trophy hunted cheetah are not allowed into the USA, the cheetah being “endangered” on the ESA (USFWS, 1999). For about six years, the international hunting community has attempted to show “enhancement” as required under the ESA (see next sections) by each successful hunter donating ND 1,000 (\approx US\$ 100-150) into a Cheetah Conservation Fund to be administered by the Namibian Nature Foundation for research. The Namibian Professional Hunters Association (NAPHA) even developed a hunter’s code of ethics for the cheetah. The USFWS has rejected these attempts at conservation.

Cheetahs in Namibia are mainly found on private ranches. It is estimated that 120/year are shot as vermin (African Advisory Board, 2000). This is a minimal estimate, some saying that up to 900/year may be shot in Namibia as vermin. If the CITES quota was respected by importing countries, it would go a long way in stopping the indiscriminate slaughter of cheetah by turning them into an economic resource (Grellmann, *pers. comm.*).

Similarly, on ranches in northern South Africa, especially in the Limpopo Province, cheetah populations have grown to the point that they are a nuisance. Game ranchers are lobbying the South African government to obtain a CITES quota. Even when they do, unless there are changes in the ESA, their biggest

market, America, will not be available and like in Namibia, ranchers will “shoot, shovel and shut-up”.

Giving value to the black-faced impala (*Aepyceros melampus petersi*) from hunting as a unique subspecies will encourage stewardship by game ranchers. Currently, an estimated 3,000+ black-faced impala reside mostly in Namibia (Hamunyela, *pers. comm.*). In Namibia, about 50% of the population is found on commercial farms and 50% in the Etosha National Park. Angola had 600 in 1975 (Huntley, 1992) and today no more than a few dozen remain (Griffin, *pers. comm.*).³³⁵ The black-faced impala is “endangered” in the ESA (ESA, 1999). The biggest threat to the black-faced impala in Namibia is hybridization with the common impala (*Aepyceros melampus*), and past war in Angola and associated poaching. In the future, registered pure-bred farms will be required to protect this species in Namibia (Grellmann, *pers. comm.*). Namibia’s Ministry of Environment and Tourism (MET) has implemented a black-faced impala program. Populations will be censused and genetically verified for purity. An east/west boundary will be identified separating common (south of line) and black-faced (north of line) impala near the southern boundary of the Etosha National Park. Buffer farms will be established where no impala will kept. Pure stock south of this boundary will be identified, and secured with fencing and buffer farms (De Jager, *pers. comm.*).³³⁶ Despite

“a ‘second draft’ Special Report (46 pages) on the black-faced impala and ‘second draft’ Draft Management Plan specifically ‘prepared for The Ministry of Environment and Tourism of Namibia, Conservation Force (USA)’ ” (Jackson, 2006b),

importation of black-faced impala is still being contested.

³³⁵ Mike Griffin, Senior Conservation Officer, MET, Namibia

³³⁶ Mich De Jager, Ministry of Environment and Tourism (MET), Wildlife Management & Utilization, Namibia

10.7.2 “Enhancement” Requirement under the United States "Endangered Species Act (ESA) "

For animals listed under the U.S. Endangered Species Act (ESA), the Office of Scientific Authority (OSA) asks,

“Does hunting/killing of an animal enhance the survival of the species”?

Under ESA, it must be scientifically determined that use for scientific purposes, hunting, etc. will enhance survival of endangered species. If OSA finds enhancement, then the Office of Management Authority (OMA)³³⁷ will issue a permit (Jackson, 2002). Unfortunately, use of “enhancing a population/species” (making things better for a species) under the U.S. Endangered Species Act is much more difficult to prove than use being “non-detrimental to a population/species” (impact is not negative to the species) under CITES. This is especially the case, when the USFWS continues to move the “goal post” in what they expect from an exporting country with regards to “enhancement”. This goes against the spirit of CITES Resolution 2.11 in which the importing country is supposed to respect the non-detrimental findings of the exporting country on accepted CITES quotas for trophy hunted species on Appendix I of CITES (Section 10.6, CITES RESOLUTION 2.11). Enhancement was rejected by CITES and was removed from the original Resolution 2.11 (Jackson, 2002). In essence, the USFWS is saying, “We do not trust your judgments, and we insist on replacing your views with our own”. The latest, USFWS internal guidelines for permitting import of Appendix I hunting trophies indicate the continued use of enhancement; the animal or plant from the wild being part of a “biologically based sustainable-use management plan” (U.S.

³³⁷ Each signatory to CITES is required to have an OSA and OMA

Federal Register, 2007) whose goal posts can be continually moved as indicated in this analysis.

10.7.2.1 “Enhancement” under the ESA linked to CITES, condemning more wildlife to die?

USFWS issued a formal notice about six years (2000) ago proposing adoption of “internal guidelines” contrary to Resolution 2.11(Rev.) of CITES that governs trophy imports. The proposal is still open without a final rule (Jackson, 2002).

“If the USF&WS adopts the ‘internal guidelines’ or if it practices them anyway as with current Cameroon trophy hunting import permits on appeal, the cost of keeping hunting open for CITES Appendix I and Appendix II species will become prohibitive. The anti's will have a field day. Developing nations will no longer view sport hunting as a practical option” (Jackson, 2002).

“While controversial, currently, the Office of Management Authority (OMA) is demanding enhancement under CITES before it okays issuing an import permit for sport hunted trophies of species listed on CITES Appendix I (Endangered, such as the African Elephant). They say this is consistent with the purpose of the ESA. OSA says that the OMA has the right to be more rigorous for endangered species!! Thus the US Government takes ‘Stricter Domestic Measures,’ as allowed under CITES.

Though the ‘internal guidelines’ have not been formally adopted, they appear to have been informally adopted. The OSA is going beyond its recognized authority in determining the ‘purpose’ (upon reaching the importing country) is not detrimental. It’s requiring proof of ‘enhancement’ and ‘management’ to its liking before it issues permits for trophy hunted animals with CITES Appendix I quotas. If the species is endangered and threatened under the ESA, OSA will make a Biological Assessment of the species. OMA reviews this assessment by OSA and usually accepts their finding as basis of the ‘Enhancement Finding’.

At this time the USF&WS is only demanding graduated steps of achievement from developing nations but it is not possible for a lay

applicant to know what steps or progress the Service wants or will find acceptable each successive new permit year. (The fact that they will accept progress instead of a finished or perfected program is itself a victory of sorts that our fighting has brought into existence as a compromise.) Permits have to be filed and denied to even discover what the USF&WS wants. Most of the time the Service does not know what it wants either, at least not until it is put before them through the processing of a permit" Jackson, 2002).

"Organizations like Safari Club International have taken a position that it is improper private inurement to a member to help a permit applicant. Yet, no private individual can afford the hundreds of thousands of dollars of legal cost" (Jackson, 2002).

"The enhancement examination is being arbitrarily applied, but it also has no ESA legal basis. The ESA Final Rule for elephant trophy imports provides only one basis for the 'enhancement' requirement and that basis no longer exists. It was based wholly and exclusively on the U.S. Fish and Wildlife Service's misinterpretation of CITES Resolution Conf. 2.11 that was subsequently revised by the Parties to eliminate that very misinterpretation. The 'enhancement' language was deleted from the Resolution after the adoption of the ESA Special Rule" (Jackson, 2002).

"At COP 9 the passage of the revision of Resolution Conference 2.11 (Revised at COP 9) was to prevent the very USF&WS administration of CITES elephant trophy hunting import permitting practices that are being repeated in 2002, elephant permit denials from Cameroon, which are on Appendix I but which have a CITES trophy hunting quota. The revision completely deleted the clause that had stated importing Parties could make a biological enhancement review and instead replaced it with the presumption that the biological non-detriment determination made by the export country should be accepted at face value" (Jackson, 2002).

"Thus the US Government uses CITES linked to the ESA as a means of intervening in the sovereign affairs of another nation, without proving that its actions are encouraging conservation. Their actions certainly are keeping countries like Cameroon from valorizing elephant as a sustainable resource, and in the much needed currency for the game department to operate and for

community development. The USFWS actions infringe upon the sovereignty of these countries, and take a patronizing attitude that they are incapable of managing and controlling the sustainable off take of their resources" (Jackson, 2002).

Species impacted by the "enhancement" process include the elephant in Cameroon and Mozambique, the cheetah and black-faced impala in Namibia, the black rhino in Namibia and South Africa, and the leopard in West, Central and North Africa (Jackson, 2006/11/14).

Enhancement Under the ESA as an Impediment to Conservation Of Cameroon's Elephant

The following case study on Cameroon's elephant shows how the USFWS changes the goal posts for enhancement, so that Cameroon can never meet their definition and thus can never export trophy hunted elephants to the USA.

Cameroon has an estimated elephant population of between 65,000 +/- 5,000 elephant, and of this 30,000 +/- 5,000 in the southeastern forests (Koulagna, 2002), depending on which expert one talks to. Tchamba, Barnes & Ndiang, 1997 predicted 27,619 country-wide with 24,899 in the entire forest zone. Forest elephants are difficult to count so complicated dung counting models have been developed with high standard errors. Southeastern Cameroon forests have among the highest concentration of elephants in Africa, varying from 0.8-1.5 individuals/km² (Usongo, 2002). Cameroon has a CITES hunting quota of 80 elephants of which about 40 are taken per year (MINEF, 2001).

The majority of the trophy hunted elephants come from Southeastern Cameroon. The off-take of 20 forest elephants in the southeast, even with a conservative estimate of 25,000 (Koulagna, 2000) elephants in the forest area of the southeast,

is 0.08% of the population.³³⁸ This must be considered insignificant with regards to potential negative impacts on the population and yet could generate significant income for elephant conservation and conservation in general.

The European Union (EU) respects Cameroon's CITES quota for elephants (Jackson, 2002) and its efforts as a leader in West African conservation, allowing trophy hunted elephant from Cameroon to be imported into EU member states.

However, the USFWS is not allowing trophy hunted elephant parts (e.g., tusks, ears, feet, tail, skin) into the USA, since Cameroon cannot show "enhancement" of the species. Using "enhancement", the USFWS keeps moving the "goal post", making it difficult for Cameroon to fulfill its continually changing but vague requirements for "enhancement" of its elephant populations. Some of the reasons given for the denial of these permits are contrary to CITES. Specifically, the requirements that are ultra virus (in excess of legal power) are the following (Jackson, 2002):

- (1) The criteria that poaching be controlled;
- (2) The criteria requiring better elephant population estimates, particularly in a heavily forested country;
- (3) The DSA/OSA³³⁹ requirement of proof of "enhancement" to make a CITES non-detriment import determination;
- (4) The DSA/OSAs disregard of Cameroon's biological non-detriment export determination; and
- (5) The DMA/OMA and DSA/OSA making their own duplicative biological determination of the findings intended to be made by the

³³⁸ Koulagna (2000) estimated 30,000 +/- 5,000 for Southeastern Cameroon

³³⁹ The U.S. Fish and Wildlife Service now designates its scientific authority as the Division of Scientific Authority (DSA) and management authority as Division of Management Authority (DMA).

exporting country instead of the complimentary "purpose of the import".

Since 1994, Cameroon has taken all the possible steps one could expect, and is seen as one of the leaders in conservation in Africa. Among others, these steps include:

1. 1994: The Forestry and Wildlife Law came into existence, which ensured that by 2002, 15% of the territory was in protected areas;
2. 1995: The Maroua Elephant Workshop was held;
3. The SCI MINEF (*Ministere de la Environment et Forets*, Ministry of Environment and Forests, Cameroon) elephant compact was established in which each hunter contributes US\$ 500 into an elephant conservation fund;
4. 1997: The second elephant workshop was held at the Mbalmayo Convent on the outskirts of Yaoundé;
5. Sept. 1998: The Cameroon Elephant Management Plan was officially adopted;
6. May 1999: The "Yaoundé Declaration" was adopted in which heads of state signed an agreement in Yaoundé over protection of the Congo Basin – Congo, Cameroon, the CAR, the DRC, Gabon, Equatorial Guinea and Chad to protect tropical forests in the region;
7. The prime minister's office created an anti-poaching committee;
8. 1999: Forest hunting blocks were geographically delineated to permit better management similar to already existing savanna hunting blocks;
9. 1999: MINEF began trapping the military, Justice Department and local authorities involved in ivory poaching;
10. 2000: The first income from sport hunting revenues (1999 season) was distributed to the state, local government and local communities from

block fees based on area, continuing each season thereafter (10% to villages, 40 % to communes and 50% to government plus trophy fees). It is unclear how successful this has been in getting benefits down to village and commune level (see Chapter 11, Section 11.11.6.7, Revenue sharing from safari hunting);

11. Jan 2000: Due to conservation actions taken by Cameroon, the European Union (EU) lifted its ban on the importation of sport hunted elephant trophies to Europe;
12. Southeastern Cameroon Elephant Implementation Plan Workshop, Yokadouma;
13. May 2000: MINEF attended the inaugural Bushmeat Task Force meeting in Washington, D.C.;
14. December 2000: The Lake Lobéké/Dzanga-Sangha/Nouabalé-Ndoki *Tri-National De La Sangha* National Park was created;
15. 2001: Cameroon appointed not only a “national elephant officer” but also an “anti-poaching officer” and a “bushmeat trade officer” to act as focal points in these key ongoing processes;
16. 2001: Ivory stockpiling and inventorying by MINEF was done using the Pierre Guerrini hunt donation to SCI;
17. 2001: The trophy quality monitoring program began in Southeastern Cameroon, linked to a WWF wildlife monitoring program;
18. Jan, 2001: A meeting took place between the wildlife directors of Cameroon, Equatorial Guinea, Chad and Gabon along with representatives of the collaborating organizations: WWF, IUCN (represented by its Regional Office for Central Africa), IUCN/SSC’s African Elephant Specialist Group (AfESG), WCS and MIKE to discuss the creation of a Central Africa Elephant Strategy (CAES);
19. 2001: The Project Noah Scholarship was set up to send one student from the savanna and one student from the forest area to the Tshwane

University of Technology, South Africa, to study for a diploma in nature conservation. The recipients are selected from rural communities where hunting takes place. By 2006, one student will be studying for his B-Tech and one for a master's degree, both returning in 2007 to begin developing a model integrating communities into the management of hunting areas;

- 20.** 2002: Douala housed the regional TRAFFIC office;
- 21.** 2002: Yaoundé housed the regional bushmeat task force office;
- 22.** 2002: The Organization for the Conservation of African Wildlife (OCFSA) moved its headquarters from Khartoum to Yaoundé following the need expressed by the Central African heads of state during the Yaoundé Summit of March 1999; and
- 23.** 2003: Two MINEF staff began their masters/doctorates to institutionalize wildlife monitoring in safari hunting areas as a means of setting quotas and making other management decisions, Shikar Safari Club scholarship.

Denis Koulagna Koutou (2002), director of Wildlife and Protected Areas for Cameroon sent John Jackson of Conservation Force the following email laying out the progress being made, and the frustrations about how they were being treated by the U.S. Fish and Wildlife Service, the subject being "elephant permits:"

"It is worth mentioning that in the wake of the summit of Heads of State of Central Africa on the Conservation of the Congo Basin Forest, only Cameroon developed an Emergency Action Plan and spearheaded the creation of Conference of Minister in Charge of Forestry in Central Africa (COMINFAC). Ivory and bushmeat markets, which were visible in the past, have been nearly stamped out in major cities. Emphasis should now be laid on airport and ports. In this regard, the African Elephant Conservation Act (AECA) of the United States) proposal would have been most helpful (USFWS refused to fund an antipoaching training program in Cameroon under the African Elephant Conservation Act). We

recently developed, with the World Bank Support, Forest/Environment Sectoral Program (FESP), which deals mainly with the wildlife and protected Areas Sub-Sector. A strategy for better management of wildlife and protected areas has been devised and is being adopted. In a bid to implement the FESP orientations 100 motorcycles, 20 double cabin Nissan were given to field services (conservators of protected areas) for a total cost of 750 millions CFA (US\$ 1,071,428). Coming to specific elephant-related problems, instead of the administrative battues that were organized in the times of Human/elephant conflict, the Ministry allocated 10 millions CFA (US\$ 15,000) to the provinces concerned to organize driving backs. As regards trophies, our stocks are well known and declared to CITES which will be invited for a marking operation. A fortified site is currently being built. The control of sport hunting is now well regulated and quotas are granted in agreement with international conservation organizations working in the areas (WWF for the North and The South East, CEDC³⁴⁰/University of Dschang/Leiden University for the Far North Province). Hunting zones are allocated through a transparent procedure, hunting activities are strictly monitored and agreements have been signed with private operators to better integrate the interests of local people and councils. Reforms are undertaken at the level of the Ministry to train and supervise village guards that would be recruited by the councils and communities. Back now on the regional grant, Cameroon recently offered, not only offices, but also some 30 millions CFA (US\$ 42,900) as well for the launching activities of the Organization for the Conservation of African Wildlife (OCFS) whose headquarters were moved from Khartoum to Yaoundé. It should be noted that most conservation organizations (WWF, IUCN, MIKE/CITES Program, Bushmeat/CITES Program, etc.) have moved their headquarters to Yaoundé. In addition, Cameroon has been designated as West and Central Africa representative in CITES Standing Committee..." (Koulagna, 2002).

“...I must say that I am deeply disappointed by all the setbacks experienced by you and our country despite all our efforts” (Koulagna, 2002).

³⁴⁰Center For Environmental & Development Studies of Cameroon /Centre Des Etudes de L’Environnement et de Développement du Cameroun, Maroua, Cameroun

The USFWS refuses to allow legally hunted trophy elephant from Cameroon into the USA, despite having a CITES quota. Cameroon's elephant is on Appendix I of CITES (CITES, 2005b) and all African elephant are listed as "threatened" on the ESA (USFWS, 1999). The USFWS had also turned down a Cameroonian government anti-poaching proposal to control the illicit movement of bushmeat and ivory (MINEF/SCI, 2000). The reader can judge for himself whether Cameroon has done everything possible to undertake good conservation.

Money is finally being distributed to stakeholders by the Ministry of Environment and Forests (MINEF) from hunting block area fees and trophy fees (SCI Africa Office, 2001b). During the 1999/2000 season, the following income from hunting and collecting in the forest was distributed as follows (Mboh, 2000).

- CFA 9,809,811 (US\$ 15,092) went to the villages (percentage of trophy and hunting block fee);
- CFA 15,003,244 (US\$ 23,082) went to the communes (percentage of trophy and hunting block fee); and
- CFA 78,747,654 (US\$ 121,150) went to the state (percentage of trophy and hunting block fee, as well as hunting licenses, collecting permits, arms tax).

Savanna Hunting Areas (Benoué, Faro, Boubangida), Year 2000, Money From Hunting Concession Block Area Fee Determined By "X" CFA/Hectare as provided by MINEF was (SCI Africa Office, 2001b):

- CFA 60 million (US\$ 92,307) went to the villages (10%);
- CFA 240 million (US\$ 369,231) went to the communes (40%); and
- CFA 300 million (US\$ 461,539) went to the state, not counting other fees such as *taxe d'abattage* (trophy fee) and hunting license fees (50%)

Ideally, more money should be going to the villages, but it is a start. Is Cameroon perfect? No, but they are trying. There is a need for auditing of how the money above is spent to assure transparency and accountability and this information needs to be provided to stakeholder villages. There is a need to better integrate local communities into the management of these natural areas for multiple use (see Chapter 11, Section 11.11.6 Eco-Genocide in Southeastern Cameroon, the Forest People and the Dobi Dobi, More Parks and Protected Areas). Corruption is a major issue as all over the subcontinent. Regardless, stopping the beneficiation of elephant will not save the elephant.

The principal author was informed by Richard Ruggiero³⁴¹ of the USFWS in 2001 of factions within the Cameroon military trafficking elephant ivory out of Congo Brazzaville (SCI Africa Office, 2001c):

“Says the minister (of Environment, Congo) is in cahoots with the Cameroonian military and President Biya of Cameroon. A large area in Congo south of Oueso is being poached out of elephant, with the ivory being transported through SE Cameroon via Moloundu or Ngoila/Lomie (Dja) to Douala via military convoy. The military uses this money to get rich and provide themselves with operational fuel for the army to function. Mr. Ruggiero showed me an email from Derek Westfall in US Embassy, Cameroon discussing this issue. Mr. Ruggiero explained that Denis (Koulagna) knows of this, but if he tries to stop it, he is out. Denis is very frustrated and he feels SCI and USFWS must back him up and support him. Mr. Ruggiero felt like Denis was the ‘BEST’ he has seen in a long time in Central Africa; a man with a vision” (see Section 10.3.3, CITES, Drives Ivory Market Underground).

In addition, in 2007, concern is being raised that the forest elephant is being heavily poached; valued at an average per elephant of US\$ 180 for ivory and US\$

³⁴¹ Richard Ruggiero, U.S. Fish and Wildlife Service (USFWS), 4401, N. Fairfax Drive, Rm. 420c, Arlington, Virginia 22203

6,000 for about 455 kg (1000 lb) meat (Tomlinson, 2007). Granted this does not look good, but on the other hand does it make sense to stop conservation activities linked to wildlife and elephant within Cameroon. The goal must be to try and make these programs stronger and more viable, for instance empowering the Baka Pygmies to become the “guardians of the forest” and to stop outsiders coming into their areas (see Chapter 11, Section 11.11.6.12, Let the Pygmies be the guardians of the forest).

It is believed that, among other problems, the USFWS policies towards wildlife in recent times stem from the infiltration of the service by animal rights groups under the William (Bill) Jefferson Clinton Administration. For instance, Sue Lieberman of the Humane Society of the United States (HSUS) (Bonner, 1993) was given a high level position within the service. It is believed that she opened the door for many more animal rights representatives. Even though she has since been removed³⁴² by the Bush Administration, many lower profile individuals representing animal rights philosophies are believed to still reside within the USFWS. If they do not directly influence policy, they find ways of stopping appropriate actions such as the refusal to fund AECA grants requested by Cameroon since 1995, including the Southeastern Cameroon Elephant Workshop and anti-poaching training.

10.7.2.2 Enhancement as a requirement. Why it was inappropriate in 1993 and still is so in 2002

The following are comments to the USFWS by world-class experts³⁴³ with African experience on proposed “enhancement” guidelines by the USFWS back

³⁴² Currently: Dr Susan Lieberman, with WWF-UK as Director of WWF Species program on +447769740311, email: sieberman@wwf.org.uk (see <http://www.wwf.dk/4d22774>).

³⁴³ Graham Child, Retired Director of National Parks and Wildlife Management, Zimbabwe, Advisor to the Botswana Government and Head of Wisdom Foundation; G. Hemley, Director of TRAFFIC USA; Rowan Martin Former Deputy Director, National Parks and Wildlife

in 1993. They are as relevant today as they were then, as this issue resurfaces on how the USFWS and maybe the EU interpret CITES Appendix I and possibly Appendix II hunting quotas for importation. Common themes coming from responses are:

- Adaptive management through careful monitoring of trophy hunted elephant tusk weights and hunter success is the one cost-effective means of assuring that trophy hunting of elephant is sustainable;
- If an error is made and trophy male elephant are over-harvested (0.5 to 1% of the elephant population with trophy tusks), this has economical but no biological implications on the particular elephant population;
- In the USA and Europe, total counts of game species are not cost-effective, nor are they required or used in making management decisions and in determining hunting off-take quotas, various harvest indices are employed (see Chapter 9, Section 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability);
- Governments lack the finances, manpower and expertise to actively manage elephant herds and the ability to compensate rural communities for losses incurred from living with elephant and other wildlife;
- Providing economic benefits to impoverished rural communities to offset losses from living with elephants is the most important factor, as opposed to biological factors, which can help assure the

Management, Zimbabwe and one of the founders of the community based natural resources management program CAMPFIRE; Ian Parker Ex-Warden, Kenya and elephant researcher in Kenya and Uganda, author of many books including "The Ivory Crisis; D. Rottcher, Wildlife Veterinarian and Conservationist, Kenya Wildlife Service (KWS); H. Rumpf Permanent Secretary, Republic of Namibia, Ministry of Wildlife, Conservation and Tourism; Letter to USFWS from Department of National Parks and Wildlife (DNPW); Zimbabwe, Comments by Government of Tanzania.

survival of elephant and their habitat struggling to compete against an ever-increasing human population and their livestock;

- The biggest annual loss of elephant in Africa is from Problem Animal Control (PAC), in most cases even more so than poaching;
- Even in the case of declining elephant populations, trophy hunting can help reverse or slow this decline by providing the above-noted benefits to rural communities and governments to manage and conserve both the habitat and population; and
- The presence of safari hunting is a disincentive to poachers frequenting hunting blocks to illegally kill elephant. There is no evidence that sport hunting for elephants has ever been detrimental to a population.

It was viewed as neither impartial nor scientific in justification of “enhancement” by the USFWS, but more to appease the anti-hunting lobby. The presence of tourists in the Nairobi National Park and Amboseli Park is a disincentive to poachers, whereas with closure of hunting in Kenya in 1977, illegal hunting rose dramatically. No evidence of legal sport hunting in the last 40 years has been shown to be detrimental to elephant populations. Requiring enhancement by African countries in order to import trophy hunted elephant into the USA is analogous to saying to an innocent man,

“I know of no crime that you have committed or intend committing, but you must prove to me that you have committed no crime and do not intend doing so” (Rottcher, 1993).

Thus, there appears to be an assumption of inherent criminal or negative intent. The largest single source of elephant mortality in the 20th century was the lawful elephant reduction programs undertaken by governments to protect or make way

for agriculture (Rottcher, 1993). About 2,000 elephants/year are killed in Tanzania as problem animals in crop damage control (GOT, 1993).

Requiring Stable or Increasing Numbers of Elephant before Allowing in Hunted Trophies

Elephant populations outside of formal parks and reserves have little long-term prospect for survival, as a result of an erosion of their ranges by farmers. Thus, it is totally unrealistic to call for stable or increasing elephant populations (Rottcher, 1993).

“Is it inconceivable to use revenue from sport-hunting to a declining population to reverse the population trend through demonstrating financial value of elephants” (Rumpf, 1993)?

“East African elephant ranges have been contracting in the face of expanding humanity since 1925. Human increase correlates closely with decline of elephant range, which is the consequence of incompatibility between elephants and man’s agrarian land uses. Loss of range automatically produces declining elephant numbers. Only areas set aside in perpetuity for elephant – that is national parks, forest reserves and game reserves where agrarian land use is prohibited – have any prospect of long-range stability for elephants...Africa’s elephant range may still be more than 4 million km² (1.6 million mi²). Of this, less than 25% has any likelihood of long-term security as national park, forest or game reserve. Over the next century (21st) or so, it is reasonable to expect elephants to disappear over much of their range. In the face of this incontestable trend it is downright stupid to apply a blanket requirement that elephant numbers should be stable or increasing before they may be used by safari hunters. In most current huntable areas outside the permanent sanctuaries, the overwhelming trend will be unavoidably downward. This trend may be ameliorated and slowed if elephants have a value to the people usurping their ranges...” (Parker, 1993).

It is interesting to note in Kenya, there appears to be a direct relationship between the increase in human populations (+>3%/year) and the decrease in wildlife (large herbivores) (->3%/year), apparently from habitat loss (see Chapter 5, Section

5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya - Maasai Mara).

There are two effective measures for African elephant conservation: 1) adequate funding in state protected areas and 2) high economic value for elephant in the areas outside of them.

“Sport hunting of the African elephant confers a higher economic value than any other form of consumptive use, is not detrimental to the species and therefore an important and practical method of conservation...Rural communities in Zimbabwe presently (1993) derive US\$ 1 million from the sale of elephant for sport hunting. This enables them to offset the cost of maintaining elephant populations in settled areas and thus enhances survival; through the provision of elephant range beyond the boundaries of protected areas...sport hunting for trophy males also contains an element of self-regulation. The demand for elephant trophies is proportional to the density of males with trophy-sized tusks, and decreases in proportion to hunter success (high hunter success for big tusks – high demand, low success rate – low demand). Secondly the African elephant is sexually mature at about 14 years of age, and males only produce tusks of trophy quality (Zimbabwe average 26.2 kg/58.3 pounds) at the age of 25 or older. Even if sport hunters took all trophy males from a population, there would be a substantial proportion of sexually mature males to maintain the population. These would comprise males in the age range 14-25 years, and older males with naturally small tusks” (DNPW Zimbabwe, 1993).

An elephant population confined to a well protected area (e.g., safari hunting block) may be well protected, but declining since food becomes limiting. In such instances there tends to be a larger proportion of adult males and no reason why some of these males cannot be harvested by sport hunters.

“A limited trophy harvest of males is possible under almost any population condition except where the population has been subject to or has a recent history of high illegal off-take” (DNPW Zimbabwe, 1993).

Requiring Total Elephant Counts before Allowing in Hunted Trophies

Trying to get total elephant counts is difficult and expensive. Even in the USA, the world's wealthiest country, most wildlife populations are managed through measurement indices such as age of off-take and weight by individual, as opposed to detailed counts and precise knowledge of population sizes. If hunters or countries have to comply with all that the USFWS guidelines call for, then trophies from many African countries will not gain entrance into the USA and there will be nothing to counter the adoption of other land uses by rural communities which exterminate elephant more certainly than any other way (Rottcher, 1993) (see Chapter 9, Section 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability).

Europe, Britain and parts of the USA – to name three regions – have managed wildlife populations successfully for centuries without management goals, describing the size and sex-age composition of populations. In deer management in the USA, off-takes are planned from age structure of the current year's hunting off-take, not detailed and accurate physical counts. The manner in which all farming and natural resources utilization proceeds is through practical trial and reaction to the results (adaptive management). Next year's use depends on this year's results. The developed states can produce no example of large-scale exactitude demanded of Africa by the Office of Scientific Authority (OSA) of the USFWS (e.g., total numbers of a game species) (Parker, 1993).

Enhancement for issuance of an import permit clearly exceeds the provisions of Article III of CITES, although it may be allowable under the ESA. Without

precise and operational definitions of “enhancement” and “clear evidence of enhancement”, it will be impossible for range countries to know what standards they must fulfill to satisfy the service (USFWS). Enhancement assumes that the elephant sport hunting program has been in place long enough to generate a significant body of “clear evidence” of enhancement. This would limit the ability of aspiring African range countries (e.g. Mozambique and Cameroon) to develop and implement elephant sport hunting programs by making them “off limits” to American hunters until they have already proven themselves. Such countries would be disadvantaged (Hemley, 1993).

“There are a number of potential situations where an African elephant population may be declining – due to directed management, habitat loss or poaching – but where sport hunting is not-detrimental or even enhancing the survival of the species...Wildlife populations are rarely managed to obtain some ‘optimal’ size and sex-age composition within political borders. Many elephant populations are at least partially migratory, and may cross international borders regularly and with impunity. Size and sex/age composition of herds will, therefore, change on a regular basis,...” (Hemley, 1993)

being dynamic and making it difficult to set static goals. Sophisticated field surveys even on a regular basis are beyond the capability of most wildlife management departments, even in the United States. Few wildlife management agencies anywhere in the world, including the USA, manage wildlife on the basis of “routine biological surveys” of both population composition and habitat condition. Most employ an adaptive management strategy, which monitors the age/sex composition of the harvest or an index of population trend (e.g., trophy quality, hunter success). The introduction of sport hunting in specific areas may provide the incentive for their long-term conservation (Hemley, 1993).

If the U.S. Guidelines are genuinely intended to enhance the survival of elephant in Africa they should forsake biological criteria and concentrate on socio-

economic limiting factors, including highest market value, not undervaluing it through over-regulation, and making sure people living with elephant receive sufficient returns as incentives to conserve the species. The over-hunting of the 0.5 to 1% of the elephant population with trophy tusks, if it were to occur, is of economic but not biological significance, as it does not affect reproduction adversely in wild populations and may enhance it by increasing the proportion of females per unit of population. At most, a “lower weight limit” should be placed on female and/or male tusks from sport hunting that may be imported. Experience shows that the only cost-effective way to manage unrestricted elephant populations is by applying the principles of “adaptive management” (Child, 1993).

“The issue which your proposal is trying to address is unfortunately bedeviled by a past history of actions under CITES, your Endangered Species Act (ESA), African Elephant Conservation Act (AECA), and various other proposed rules, adopted rules and guidelines. We would like to step back from this tangle of precedents and pose some fundamental questions, which we feel you should address...Let us consider...what approach should be adopted by a responsible conservancy agency in a country which is not a ‘range state’ for elephant – remembering that the sole tool which the agency has at its disposal is the power to determine whether or not it will permit the import of trophies from sport-hunted elephant:

1. It could prohibit the import of tusks which it thinks might not have been taken in such a way that the population from which the trophies originated was enhanced; or
2. It could admit all imports which bear the stamp of approval of the exporting company and look for other methods to assist in improving the management of the elephant” (Martin, 1993).

In the case of option #1, few African countries have the will or possess the means to introduce measures demanded by the proposed guidelines. Thus, option #1

would not have the desired effects in helping to conserve the elephant. If option #2 were taken, the USFWS OSA could monitor the magnitude and trend of trophy tusk quality (adaptive management) (Martin, 1993). Far more will be gained by option #2 (Martin, 1993), although in the opinion of the authors, monitoring should be the responsibility of the stakeholders from the exporting country with this information being made freely available to any importing country.

“If you really want to assist elephant conservation, then control of imports is not an appropriate method. It is rather like attempting to improve the standard of driving in Washington through the issuing of parking tickets...It is unlikely that an error in the import of a sport-hunting trophy by the Office of Scientific Authority (OSA) will be the deciding factor for the survival of any elephant population. Elephant will continue to decline in many countries as long as they are of no economic value – but they are not on the brink of extinction. There is time to put into place appropriate conservation measures through a sympathetic approach rather than one, which attempts to exert leverage. The underlying philosophy of the Endangered Species Act (ESA) – which is perpetuated in the proposed Guidelines – does not admit of an ‘adaptive management’ approach to these sorts of problems. Rather it seeks safeguards in advance arising from perfect predictions based on prior scientific study. It is not keeping pace with changes in methods of wildlife management and is unlikely to produce results” (Martin, 1993).

An “adaptive management” paper was attached to this response showing how tusk mass could serve as an important management tool and even be related to age and sex. Bull tusk trophy quality in Zimbabwe between 1987 and 1993 did not change significantly with yearly averages from a low of 18.66 kg/tusk (41 pounds) to a high of 20.34 kg/tusk (44.8 pounds) indicating that there had been no large change in bull trophy quality during this period (Craig & Gibson, 1993).

From an African perspective, one might call the current use of CITES and the ESA a form of eco-imperialism.

10.8 THERE'S AN AFRICAN LION JUST AROUND THE CORNER

Source: with permission from the artist, Paul Bosman, Wildlife Investment, Inc.,
<http://www.wildlifeart.net/books.html>

"Lion breed 'like rabbits' (over 20% per year) provided they have suitable habitats and protection. The Serengeti population is probably one of the best researched on the continent. It lost one third (33%) of its population due to an apparent mutation of the Canine Distemper Virus around 1994/95 (from 3,000 to under 2,000) and is back now to an all time high of around 3,800 in that ecosystem...The Kenyan listing is irresponsible. It recognizes the inadequacies of the recent censuses, yet it immediately turns around and cites them as if they were perfectly accurate...Tanzania has more lions than any other country in the world, and the majority of these animals live outside the national parks. If lion trophy hunting were stopped, they would have no economic value, and there would no longer be any incentive to conserve the lions. Opponents of trophy hunting have provided no alternative mechanism for funding the large-scale conservation efforts required to protect the species...I think that the situation in Kenya illustrates that lions would be viewed only as threats to people and livestock in the absence of trophy hunting. Lions in Amboseli National Park were exterminated by angry Maasai in the early 1990s, and 75% (three-fourths) of the lions in Nairobi Park were speared in the past year. Lions inflict serious damage to these

people's livelihoods, so why should they be tolerated outside the parks"? (Packer, *pers. comm.* In: Baldus, 2004).³⁴⁴

In October 2004, gladiators from around the world entered into a coliseum to battle over the future of the African lion, only it was not in Rome, Italy, but in Bangkok, Thailand, at CITES COP 13. It was one of the biggest circuses on earth, only there were people, countries and advocacy groups on show. If the potential to sustainably use Africa's wildlife and possibly timber as a catalyst for development were not so dependent on the outcome of CITES, taking a step back and observing human behavior, politics and maneuvering would be quite amusing. On one side were Western countries and Western urban-based animal rights groups using Western governments and developing world proxies such as Kenya, who had been bought off by these groups (e.g., IFAW) to support placing the charismatic African lion (*Panthera leo*) on Appendix I of CITES. These groups believed that controlled trade would protect the future of this species. In animal rights lingo this means "no trade", using Appendix I through various government signatories to find ways of eliminating if not stymieing trade in hunting trophies. Opposing gladiators were sustainable use groups, including community-based NGOs and hunting organizations along with African governments, who saw the conservation of the African lion through its sustainable management for economic purposes as the only hope of saving the African lion and its habitat.

As discussed above, addressing issues on the ground such as poverty, habitat loss, human-lion conflicts, problem lion control (PAC), "revenge killings" from rural people angered by lack of compensation for lost livestock or little or no benefits from the loss of critical dry season grazing lands to parks and hunting blocks will

³⁴⁴ Dr. Craig Packer. Distinguished McKnight University Professor, Dept. of Ecology, Evolution and Behavior, University of Minnesota, St. Paul, studying lions in Tanzania, including impacts of hunting, packer@cbs.umn.edu.

determine the future of lion populations in Africa, not stopping/limiting trade. In fact, there is no indication that regulated trophy hunting has ever jeopardized a lion population in Africa.

Kenya circulated a pre-proposal (KWS, 2004) for consideration at the 13th meeting of the October 2004 Conference of the Parties (COP 13) to the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora. This recommended transferring African populations of *Panthera leo*, the lion, from Appendix II to Appendix I. Currently, only the subspecies *P. leo persica*, which is extant only in India, is listed on Appendix I while the remainder of the species is listed on Appendix II under the higher taxon listing of Felidae.

Kenya feels that *Panthera leo* meets the Resolution Conf. 9.24 biological criteria for inclusion in Appendix I. There is an ongoing decline in the number of individuals in the wild [CITES Annex 1, Criterion C(i)], while threats from human settlements, disease, and over-exploitation through trophy hunting are evident [CITES Annex 1, Criterion C(ii)]. The populations of West and Central Africa are small, fragmented and decreasing in some areas [CITES Annex 1, Criterion A (i) and (ii)]. Kenya believes the species would benefit from an Appendix I listing by allowing the Conference of the Parties to consider and set export quota levels in accordance with Resolution Conf. 9.21 (KWS, 2004).

It is interesting to see this proposal coming from Kenya, which has a rather dismal track record for maintaining habitat, let alone wildlife populations. In Kenya, about 30 lion are shot each year as PAC animals, 15 in the Laikipia area. About 60-70 PAC elephant are taken each year; about 15 in the Laikipia area. All of these animals could generate huge amounts of income if linked to tourist safari hunting. In the nearby Abadare Mountains, plans existed for 1998 to cull over 25 lion in order to control their population (Powys, *pers. comm.*). This off-take will

likely worsen every year as human populations climb, encroaching on the habitat of lion, elephant and other species. The issue should not be the off-take but having adequate monitoring in place to assure its sustainability as discussed in Chapter 9. However, do not expect CITES to be practical. It is a political forum where ideologies clash for power.

By CITES Resolution Conf. 8.21, Kenya is required to advise the management authorities of the range states within which the species occurs of its intention to submit the proposal.

10.8.1 Kenya's Pre-Proposal

Kenya concluded the following:

10.8.1.1 Population status

Panthera leo is currently classified by the IUCN as vulnerable based on criterion C2a(i) (IUCN, 2003 *In: KWS, 2004*) meaning it faces “a high risk of extinction in the wild”; there is a continuing decline in the number of mature individuals (criterion C2a). According to an IUCN commission, there is not a single population of lions in West or Central Africa that is large enough to be viable: that is, around 100 breeding pairs, meaning between 500 and 1,000 animals in total. The two largest populations, in the Benoué area of Cameroon and on the Senegal-Mali-Guinea-Conakry border, are reported to have around 200 lions each. There are also about a dozen smaller populations, with around 50 lions each (Bauer & Van Der Merwe, 2004 *In: KWS, 2004*). All populations in West and Central Africa are small, fragmented and decreasing, even in some protected areas. A 2004 inventory of available information provides a conservative estimate of 16,500 to 30,000 free-ranging lions (Bauer & Van Der Merwe, 2004

In: KWS, 2004) in Sub-Saharan Africa: a decrease from a 1996 estimate of 30,000 to 100,000 free-ranging lions (Nowell & Jackson, 1996 *In: KWS, 2004).*

10.8.1.2 Threats

Kenya gave the causes for the population decline in the 1990s as increasing pressure from human settlements, disease (Canine Distemper Virus and Feline Immunodeficiency Virus, although the long-term effect of the latter virus is uncertain) (KWS, 2004) and political instability (Bauer & Van Der Merwe, 2004 *In: KWS, 2004*). Kenya claimed that research indicates that current trophy hunting levels and practices are unsustainable in some areas (Creel & Creel, 1997; Macdonald & Loveridge, 2003; Loveridge, 2004; Whitman, Starfield, Quadling & Packer, 2004 both *In: KWS, 2004*). Kenya argues that trophy hunting targets older males, which when killed are replaced in a pride by another male who kills all cubs nine months of age or less, such infanticide increasing the risk of population extinction (Whitman, *et al.*, 2004 *In: KWS, 2004*).

10.8.1.3 International trade

Kenya provided the following information on gross exports of *Panthera leo* for the past decade (UNEP-WCMC, 2004 *In: KWS, 2004*) (Tables 10.14 and 10.15).

Table 10.14: Export of lion hunting trophies from Africa, 1992-2002

Exporter	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Benin	0	0	3	4	4	10	3	3	4	1	0
Botswana	145	151	49	34	9	18	9	22	30	9	2
Burkina Faso	8	3	3	6	5	7	12	12	20	10	2
Central African Republic	23	8	9	9	6	6	3	10	12	5	0
Cameroon	26	7	5	10	14	12	9	16	20	6	9
Chad	0	0	0	0	0	1	1	0	1	8	3
Congo DRC	0	0	0	0	0	0	1	0	1	0	0
Cote d'Ivoire	2	0	0	0	0	0	0	0	0	0	0
Ethiopia	1	6	13	1	0	0	1	3	0	2	2
Gabon	0	0	0	0	0	0	0	0	0	0	2
Kenya	2	1	1	0	1	1	1	1	0	1	0
Malawi	0	0	4	0	0	0	0	0	0	0	0
Mozambique	0	0	11	5	17	14	21	1	29	15	11
Namibia	30	19	22	23	7	8	10	7	11	11	6
Senegal	1	0	0	0	0	0	0	0	0	0	0
South Africa	168	137	192	105	102	108	110	107	146	134	147
Tanzania	202	195	282	230	298	276	264	272	316	230	226
Togo	0	0	0	0	0	0	0	0	0	1	0
Zambia	118	36	51	65	50	45	82	74	47	24	3
Zimbabwe	246	189	102	123	100	93	81	123	91	95	104

UNEP/WCMC (2004 *In:* KWS, 2004) with permission, Jon Hutton Director, UNEP-WCMC

Table 10.15: Export of lion skins from Africa, 1992-2002

Exporter	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Benin	0	0	0	0	0	0	0	1	0	0	0
Botswana	8	19	33	94	234	102	64	94	72	0	0
Burkina Faso	0	0	0	0	2	0	0	0	0	0	0
Central African Republic	0	0	0	1	1	0	0	0	0	0	0
Cameroon	0	0	2	0	0	0	0	1	0	0	0
Cote d'Ivoire	0	0	0	0	0	0	0	0	0	1	0
Ethiopia	2	12	0	4	2	0	2	0	0	0	2
Gabon	1	0	0	0	0	0	0	0	0	0	0
Kenya	0	3	0	0	0	0	0	1	1	0	1
Malawi	0	3	5	2	1	0	0	0	0	0	0
Mozambique	0	0	0	0	1	0	2	21	7	13	0
Namibia	7	6	6	8	21	18	11	9	7	1	2
Senegal	1	0	0	0	0	0	0	0	0	0	0
South Africa	26	37	34	82	32	84	71	60	85	55	32
Sudan	2	0	0	0	0	0	0	0	0	0	0
Tanzania	3	25	26	34	47	35	50	32	25	13	6
Zambia	9	6	17	19	24	8	15	11	9	4	0
Zimbabwe	13	24	37	82	35	20	31	24	68	20	7

UNEP/WCMC (2004) In: KWS, 2004) with permission, Jon Hutton Director, UNEP-WCMC

It should be noted that most lions exported from South Africa are captive bred and not really free-ranging wild lion, taken under what is called “canned hunting” conditions within fenced enclosures. Minor exports include skulls, plates, bodies, bones, skin pieces, other derivatives and live animals (UNEP-WCMC, 2006).

10.8.2 IUCN Classification of African Lion

According to Kristin Nowell, the “trade” specialist on the IUCN's Cat Specialist Group, in the IUCN Red List of Threatened Species, the Central Region lion population remains “vulnerable”, but the West Africa regional population is red

listed as “endangered”, not “critically endangered”. Cameroon’s lion population remains “vulnerable”. This information was to be published in November 2004 but was fully written up and made available for CITES COP 13 in October (Jackson, *pers comm.*).

Regarding Kenya’s lion proposal, Kristin Nowell (Nowell, 2004) of the IUCN/SSC Cat Specialist Group had the following to say,

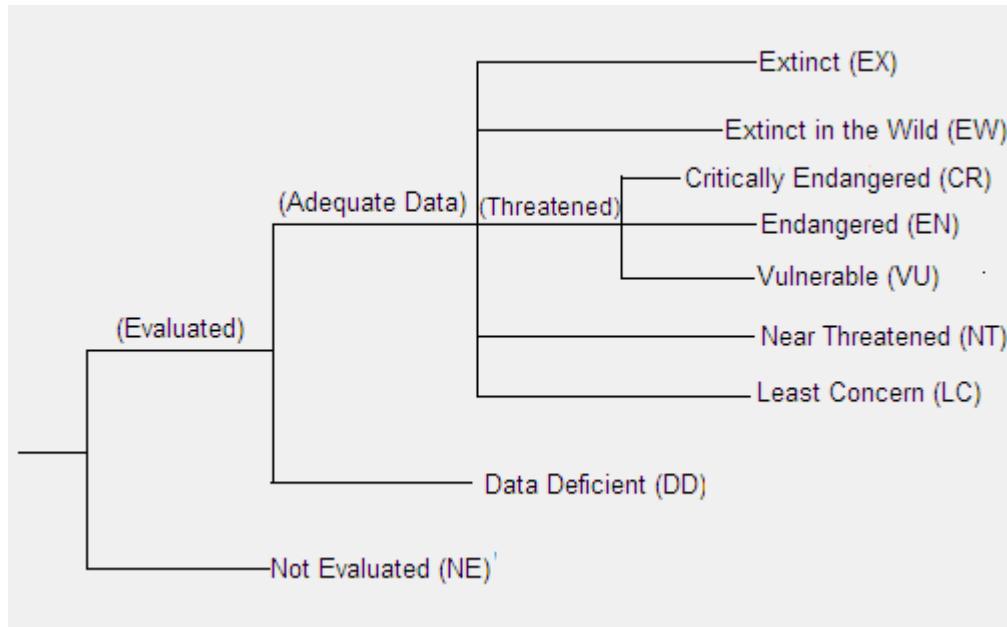
“I have just a couple things to add to support Craig (Packer) and Laurence's (Frank) comments...The first is that the (Kenya) proposal does not mention the primary threat: local people killing lions because they are problem animals. International trade is not a threat to the lion...The major international trade is in trophy-hunted animals, and trophy hunting is an important strategy for dealing with problem animals and providing economic benefits to local people living near lion populations. Transfer to Appendix I could jeopardize lion conservation by eliminating markets for trophy hunting. Despite Res. Conf. 9.21, which recommends that CITES parties permit import of approved Appendix I quota animals, some important importers still do not allow any commercial trade in Appendix I species because of domestic legislation. The main need in lion conservation is to develop strategies to enhance the lion's value to local people who may suffer depredation, and the proposal contains nothing to indicate that the current system of allowing range states to engage in controlled international trade in sport hunted trophies via CITES Appendix II is not working and should be changed.

The second is that the proposal relies on IUCN Red List information which will change in November 2004 when the 2004 Red List is released. I am attaching drafts of the new Red Listings from the IUCN/SSC Cat Specialist Group. The lion remains classified as Vulnerable, but under a different criterion. The regional population of West Africa is classified as Endangered. Again, although the cat conservation community is concerned about the status of the lion in West Africa, trophy hunting there is not considered unsustainable, and is indeed an important strategy for lion population recovery”.

10.8.2.1 Status of African lion, Vulnerable (VU A2abcd), Except Regional Population of West African

The IUCN will classify the African lion under the threatened category of vulnerable (VU A2abcd), except the regional population of West Africa, based on the following criteria as extracted from the IUCN (2000) and Baillie, Hilton-Taylor and Stuart (2004) (Figure 10.6). A taxon is vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future as defined by (Baillie, *et al.*, (2004)):

- Population reduction of at least 30% over ten years or three generations;
- Occurrence over less than 20,000 km² or occupancy less than 2,000 km², along with any of the two – 1) severely fragmented or known to exist at no more than ten locations, 2) continuing decline as indicated by extent of occurrence, area of occupancy, area/extent/or quality of habitat, number of locations of subpopulations, number of mature individuals and 3) extreme fluctuations indicated by extent of occurrence, area of occupancy, number of locations or subpopulations or number of mature individuals;
- Population less than 10,000 individuals and either 1) 10% decline over ten years or three generations which ever is longer and 2) continuing decline in mature individuals and population structure;
- Population very small or restricted in the form or either 1) population less than 1,000 mature individuals or 2) population has acute restriction in its area – typically less than 20 km² or found in less than 5 locations; and
- Probability of extinction in wild at least 10% within 100 years.



Source: IUCN (2000) with permission, IUCN.

Figure 10.6: IUCN species threat categorization

It should be noted that many species are still classified under 1994 Categories and Criteria (version 2.3) on the IUCN Red List, www.redlist.org (see latest categorization of tropical hardwoods by IUCN, Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon, the Forest People and the Dobi Dobi, More Parks and Protected Areas) (IUCN, 1994):

- Critically Endangered for A1 and A2, both $\geq 80\%$ population declines;
- Endangered for A1 and A2, both $\geq 50\%$ population declines;
- Vulnerable for A1 and A2, both $\geq 20\%$ population declines; and
- Current “Least Concern (LC)” was a sub-category under “Lower Risk (LR)” that contained sub-categories “Conservation Dependent”, “Near Threatened” and “Least Concerned”.

The following is extracted from what was published in November 2004 (IUCN, 2004a), “Change Of Criterion For ‘Vulnerable’ Classification Of The Lion, *Panthera leo*, In The IUCN Red List Of Threatened Species”:

“A species population reduction of approximately 30% is suspected over the past two decades. The causes of this reduction are not well understood, are unlikely to have ceased, and may not be reversible...The lion formerly ranged from Northern Africa through Southwest Asia (where it disappeared from most countries within the last 150 years), west into Europe, where it apparently became extinct almost 2,000 years ago, and east into India (where a relict population survives today in the Gir Forest (Nowell & Jackson, 1996 *In: IUCN*, 2004a). Most lions now occur in Sub-Saharan Africa. The most recent estimate of the population of the isolated Asiatic lion *P. leo persica* subspecies in the Gir Forest, India, is 327 (<http://www.asiatic-lion.org/news.html>)...

Previous experts have suggested the African lion population to total over 100,000 lions two decades (three lion generations) ago (Myers, 1975; Nowell & Jackson, 1996 both *In: IUCN*, 2004a). Current estimates of the population are 23,000 (range 16,500-30,000) (Bauer & Van der Merwe, 2004 *In: IUCN*, 2004a) and 39,000 (range 30,000-47,000) (Chardonnet, 2002 *In: IUCN*, 2004a) (Table 10.16). This implies steep rates of decline (approximately 60-75%), a scenario not well supported by the regional population trends...It is likely that previous population estimates were too high, and a 30% rate of decline over two decades is suspected to be more accurate, with most lions being lost from West and Central Africa. It is possible that the rate of decline may be less, but the precautionary principle precludes removing the lion from the list of Threatened Species”.

“Approximately 30% of the individual population estimates compiled by the African Lion Working Group were based on scientific surveys and 70% were derived from expert opinion or guesstimate” (Bauer & Van der Merwe, 2004 *In: IUCN*, 2004a).

The second survey was carried out by Philippe Chardonnet and sponsored by the International Foundation for the Conservation of Wildlife and Conservation Force (Chardonnet 2002 *In: IUCN*, 2004a):

Table 10.16: Comparison of African lion population estimates by two recent surveys

Region	Estimated - ALWG ¹	Estimated - IGF ²	Minimum - ALWG	Minimum - IGF	Maximum m - ALWG	Maximum - IGF
Western	850	1,163	450	968	1,300	1,358
Central	950	2,815	550	2,092	1,550	3,538
Eastern	11,000	15,744	8,000	11,268	15,000	18,811
Southern	10,000	19,651	7,500	14,526	12,500	23,425
Total	23,000	39,000	16,500	29,000	30,000	47,000

1.ALWG = African Lion Working Group survey (Bauer & Van der Merwe, 2004 *In:* IUCN, 2004a)

2.IGF = International Foundation for the Conservation of Wildlife survey (Chardonnet, 2002 *In:* IUCN, 2004a)

Source: IUCN (2004a) with permission, IUCN

“He compiled estimates for 144 individual African lion populations, grouped into 36 largely isolated sub-populations. About 63% of Chardonnet’s (2002 *In:* IUCN, 2004a) individual population estimates were based on expert opinions or guesstimates. Twelve percent (12%) were based on scientific surveys, and a further 25% were derived from extrapolation of variables from nearby populations and catch-per-unit effort-estimates based on lion trophy hunting”.

Both Chardonnet (2002 *In: IUCN*, 2004a) and Bauer and Van der Merwe (2004 *In: IUCN*, 2004a) conclude that 90% of the continental lion populations are found in East and Southern Africa, similar to findings of the IUCN/SSC Cat Specialist Group's Cat Action Plan in the early 1990s (IUCN, 2004a).

Chardonnet (2002 *In: IUCN*, 2004a) estimates that 39% of West African lion populations and 53% of Central African lion populations are declining, while the declines in Southern Africa and East Africa are much lower, at 11% and <1%, respectively. Overall, Chardonnet (2002 *In: IUCN*, 2004a) describes 25% of the individual lion populations as currently declining. Bauer and Van der Merwe (2004 *In: IUCN*, 2004a) describe the lion populations in East and Southern Africa as stable over the last three decades, while those in West and Central Africa are small and isolated.

Chardonnet (2002 *In: IUCN*, 2004a) "estimates current lion range at approximately 3 million km², with about half having some form of protection, from national park to hunting reserve. Overall, habitat for 18% of African lion populations is described currently as declining. The highest rate is in West Africa (39%), with lower rates for Central (18%), Southern (16%) and East (9%)".

10.8.2.2 West African lion, November 2004 IUCN Red List release, Endangered (EN C2ai)

The following is extracted from what was published in November 2004 (IUCN, 2004b), "Endangered Classification For The Lion, *Panthera Leo*, Regional Population Of West Africa" in the IUCN Red List Of Threatened Species.

"The number of mature individuals in West Africa is estimated by two separate recent surveys at 850 (Bauer & Van Der Merwe, 2004 *In: IUCN*, 2004b) and 1,163 (Chardonnet, 2002 *In: IUCN*, 2004b). Chardonnet (2002 *In: IUCN*, 2004b) estimated that 39% of the individual lion populations in West Africa are currently declining.

Both surveys find that West African lions constitute approximately 3% of the Sub-Saharan African lion population. Chardonnet (2002 In: IUCN, 2004b) estimates West African lion range at approximately 121,980 km² (4% of the continent's total lion range). The African Lion Working Group (Bauer & Van Der Merwe, 2004 In: IUCN, 2004b) finds that West African lions are restricted to protected areas (parks and hunting reserves), while Chardonnet (2002 In: IUCN, 2004b) estimates that one-third of the population may be found outside protected areas. Lions in West Africa are grouped into three isolated sub-populations by Chardonnet (2002 In: IUCN, 2004b) and approximately seven by the African Lion Working Group (Bauer & Van Der Merwe, 2004 In: IUCN, 2004b). Chardonnet's (2002 In: IUCN, 2004b) three sub-populations consist of 18 different individual populations, between which there may be some interchange of individuals, although this is unknown. There is disagreement over the size of the largest individual population in West Africa: the African Lion Working Group (Bauer & Van Der Merwe, 2004 In: IUCN, 2004b) estimates 100 lions in Burkina Faso's Arly-Singou ecosystem, while Chardonnet (2002 In: IUCN, 2004b) estimates 404 for the same area. Overall, both surveys found that just 5% of their West African individual lion population estimates to be of scientific quality, with the remainder being more rough and less reliable.

Three West African countries allow lion trophy hunting by tourists: Burkina Faso, Benin and Senegal. Analysis of the CITES trade database kept by UNEP-WCMC for the 1990s shows an average of 18.5 lion trophies per year were exported from the region. Burkina Faso is the primary country for trophy hunting. A stable number of 12 lions per year have been hunted there over the past two decades.

Participants at a 2001 African Lion Working Group workshop on West and Central African lions identified the following threats: habitat loss to agriculture and timber operations; habitat degradation and fragmentation due to the movements of local pastoralists and their livestock; and poaching of lions to prevent and retaliate against predation, as well as for traditional cultural practices. They recommended establishment of a low-cost regional lion population monitoring network; raise awareness among donors and decision makers of lion conservation problems; involve and support local communities in management of problems related to lions; build capacity of local managers to conserve lions;

organize a training workshop for lion survey methods; and organize lion surveys for priority areas in each country (Bauer, De Iongh, Princee & Ngantou., 2001 *In: IUCN*, 2004b) ”.

10.8.3 Responses From Lion Researchers of the African Lion Working Group (ALWG)

The following are comments made from various members of the African Lion Working Group (ALWG) undertaking lion research in Africa on the Kenyan CITES proposal through email communication as provided by Dr. Paul Funston, Department of Nature Conservation, Tshwane University of Technology, South Africa.

10.8.3.1 Dr. Paul Funston

The following summarizes a submittal to the Department of Environmental Affairs and Tourism, South Africa by Dr. Paul Funston at their request (Funston, *pers. comm.*). This input largely reflects the official position of the South African government on the Kenya lion proposal (DEAT, 2004b). The biggest threat to lion in Africa is conflict with pastoralists and farmers along with concurrent Problem Animal Control (PAC).

The Nowell and Jackson (1996) estimate of 30,000 to 100,000 lions was a guess and not the result of a systematic survey. Of the two systematic surveys (Bauer & Van der Merwe, 2004; Chardonnet, 2002 both *In: Funston, 2004*), the population is estimated to be between 16,500 and 47,000. The Bauer and van der Merwe (2004 *In: Funston, 2004*) estimate is widely recognized as an underestimate; with the actual lion population probably being 30,000. Chardonnet (2002) is probably the most comprehensive and reliable. It cannot be concluded from existing

information that there have been any shifts in lion population numbers over the last decade.

Income generated from eco-tourism and hunting makes an important contribution to conservation of lions and lion populations. The loss of hunting from placing the lion on Appendix I could result in many hunting areas being abandoned and left for encroachment by humans and their livestock, while eroding the buffer role they play in protecting lion populations within parks. There is no good evidence that trophy hunting of lion has threatened any population with extinction, though in certain areas it has led to changes in population structure. Although the hunting of older males may increase infanticide rates, this has not been shown in field studies, with lion populations breeding at similar rates in harvested and non-harvested populations. Researchers are working with the hunting community to adopt guidelines and indices to assure trophy hunting of lion is sustainable with minimal impact on population dynamics.

Feline Immunodeficiency Virus (FIV) is of no threat to lion populations and should not even be mentioned in this context, being used as an alarmist approach designed to fool those without knowledge and drawing on the human experience with HIV. Even the Canine Distemper Virus (CDV) outbreak of the early 1990s in the Serengeti was a unique occurrence with a mutated virus, with the outbreak affecting 30% of the Serengeti plains population that recovered soon thereafter.

Although high, about 95% of South Africa's trophy hunted lions are ranched or "canned" lions, the hunting of which has no influence on the free-ranging populations. However, it is contributing to a ground swell of international anti-hunting sentiment, which could be devastating for wild populations outside of protected areas in the rest of Africa, if other African countries follow Botswana's inappropriate example of shutting down lion hunting (see Chapter 9, CBNRM,

Section, 9.6.3.4, Botswana Community Trust Program) or if lions are upgraded to Appendix I. The other country with high numbers of trophy hunted lion, Tanzania, has 250,000 km² (about 25% of its land mass) set aside for hunting concessions. At five lions/100 km² this would translate to a population of 12,500, which is not very far off the upper estimate of Chardonnet (2002 *In:* Funston, 2004) of 11,852 lions in Tanzania. Considering that only the Serengeti population of about 4,500 lions is not exposed to trophy hunting, this suggests that the average number of trophy hunted lions from 1992 –2002 (235/year), is harvested from a population of 7352 – 8000 lions. This equates to only 3% of the population being killed each year, which has been determined to be sustainable (Creel & Creel, 1997 *In:* Funston, 2004).

Thus, there is no good evidence to suggest that lions meet the biological criteria for elevation to Appendix I of CITES or that by placing them on Appendix I, their population status would be enhanced. In fact, the opposite would likely occur since by taking away from their economic value, there would be a disincentive by both the safari industry and rural communities to conserve lion and its habitat, resulting in further population declines. Kenya's banning of safari hunting has been disastrous to lion and other wildlife populations and their habitat. Kenya is dictated to by foreign NGOs and animal rights groups whose motives are questionable and whose ecological knowledge and understanding of the outcomes of these policies is clearly lacking (Funston, 2004).

10.8.3.2 Dr. Lawrence Frank

There is no evidence that FIV has anything to do with lion health in the wild. There is no evidence that trophy hunting, even where badly managed, has been responsible for lion declines. In Kenya, there has been no trophy hunting for 27 years, yet lion populations have declined drastically.

Problem Animal Control (PAC), whether by government or individuals, has decimated lion populations in most of Kenya (see Packer quote, beginning of 10.8, THERE'S AN AFRICAN LION JUST AROUND THE CORNER). Even in Kenyan Maasailand, which used to have a major lion population, "revenge killing" has driven at least one lion population (Chyulu Hills) virtually to extinction in about three years (also see Chapter 9, Section 9.7.8.2, "Politics of despair", Southern Maasailand "Tarangire Ecosystem" and Chapter 11, Section 11.11.9, Kenya Wildlife Service (KWS) – Living on donor handouts, negative impact on Kenya's wildlife outside parks). This is probably happening in many other parts of Kenyan Maasailand. There are rumors of a similar increase in killing in the Mara region. In northern Kenya, very little is known due to insecurity, but by all accounts lions are spread so thinly, are so heavily persecuted and have so little wild prey that they are not likely to last much longer. Lions are disappearing outside of parks in Kenya simply because they have only negative value and are thus expensive pests. Only trophy hunting can give these animals positive value. Kenya will lose nearly all its lions outside of parks unless trophy hunting is reinstated. Legislation, which discourages trophy hunting, will merely hasten the disappearance of lions where they still exist in viable numbers. Meaningful regulation would impose much more stringent protection in countries with highly fragmented, small populations (e.g. West Africa). He believes that backed by the animal rights groups, this proposal is an effort to head off any attempt to renew hunting in Kenya as the government is about to finally attempt to change the legislation to allow ownership and some sort of consumptive use of wildlife (see Chapter 11, Section 11.11.9.6, Kenyan conservation at a crossroads). Laikipia (7,000 km²) would be an ideal place for experimental lion hunting as it has a well-studied and healthy population of roughly 200 lions that already sustain a PAC mortality of about 20%. The Laikipia Wildlife Forum is well managed and cooperative (Frank, 2004).

10.8.3.3 Dr. Craig Packer

Tanzania as a whole has 10,000 - 15,000 lions making it premature to conclude that lions are declining at an alarming rate. The Serengeti lion population (one of the largest in Africa) is probably at its highest level since the 1880s. There has been no hard data presented that trophy hunting is damaging to lion populations. His recent article in *Nature* showed that trophy hunting can be regulated with minimal impact on lion populations. No decline in lion populations has ever been shown to directly result from trophy hunting. Problem Animal Control (PAC) and “revenge killing” by pastoralists living in the vicinity of protected areas and habitat loss are the key factors impacting lion populations. In northern Tanzania, PAC is an order of magnitude higher than trophy hunting in impacting on lion populations. There is no evidence that FIV can be linked to declining lion populations, with all the healthiest lion populations having high levels of infection, and genetic data indicating that the virus has been in these populations for 1000s of years (Packer, 2004).

10.8.3.4 Dr. Luke Hunter

Kenya has essentially failed to protect lions outside protected areas despite its long ban on trophy hunting. This is a unique opportunity to experimentally restore hunting to those areas where PAC is wiping out lions that come with very clear conservation stipulations. Renewal of the concession would be based on monitoring and an increasing/stable lion population (Hunter, 2004).

10.8.4 Initial Responses from African Countries

10.8.4.1 South Africa

“*Panthera leo* does not meet the biological criteria [CITES Annex I, Criterion C 9(i) or (ii)] for inclusion in Appendix I. It seems that human-animal conflict seems to be the most important threat and this can only be addressed at a national level” (DEAT, 2004b). Note: “Criterion C (i) or (ii)” believed to be the correct citation.

10.8.4.2 Namibia

“As the proposal rightly indicates, the principal threats to the lion population are increasing pressure from human settlements (i.e. loss of range) and possibly disease. Neither of these threats will be addressed through an Appendix I listing, and in fact, such listing will most likely exacerbate the loss of range, through increasing intolerance for lions outside of formally protected areas. We feel that the conservation of the African lion will be better served through initiatives at national level to address specific threats. In conclusion, we believe that the argument and supporting data are not sufficiently robust to justify a global transfer to Appendix I. More specifically, the lion population of Namibia does not meet the criteria for an Appendix I listing, and should be excluded from any such proposal” (Lindique, 2004).

10.8.5 Risks if Lion is Placed on CITES Appendix I

“The Appendix I listing of African lion would require importing nations to issue import permits, which are not required of Appendix II species. The U.S., E.U., Australia, etc. have ‘stricter domestic’ legislation and practices when a species is listed on Appendix I...A ‘CITES quota’ is only a ‘recommendation’ and is given no legal weight in the USA. The USA (where the majority of lion hunters come from) still must make its own independent non-detrimental determination, though it may consider the information used or relied upon by the parties of CITES in setting a quota. The U.S. makes its own biological non-detrimental finding on a country by country, and year by year basis before it permits the importation of Appendix I species. If there is not sufficient information, it is prohibited from issuing an import permit. If it

finds the taking of the animal is not detrimental, its information and judgmental basis of its finding is subject to disclosure and judicial review by any ‘citizen’ or organization” (Jackson, 2004a).

Threatened with lawsuits by various interests groups

“permit applications are often shelved indefinitely by government bodies such as the U.S. Fish & Wildlife Service (USF&WS). The burden of proof is on the applicant, not the USF&WS (government). It is also administered as a ‘low priority’ - literally, taking years and 100s of 1,000s of dollars in legal services to process the initial import permits through the non-detriment determination stage (by the interested parties, not government). The cost of gathering and providing the biological data is often, if not normally, cost prohibitive and often beyond the state of the art” (Jackson, 2004a).

As has been seen, the USFWS often takes “stricter domestic measures” for CITES Appendix I species/populations, using continually moving “goal posts” requiring countries to demonstrate “enhancement” that is never achieved. This could effectively end hunting as a conservation and development tool of the African lion in many Sub-Saharan countries (see Section 10.7.2, “Enhancement” Requirement Under the United States "Endangered Species Act").

The swords are drawn, the two opponents circling, each searching for the other’s weakness. Who will win? Does right make might or is it about who has the most cash, prostitutes and other favors to hand out? Or is it about the more economically and militarily powerful West continuing to impose its value systems, often hypocritical, on the developing world? The same old, same old, where Africa as usual, along with its people and wildlife comes out the loser; the giant trouncing the ill prepared midget! Time will tell!

On October 11, 2004 Bangkok, Thailand at CITES COP 13 at an unexpected night session of Committee 1 on Monday at 8:55 PM, Kenya withdrew its lion proposal after a one and one-half page statement. There will be no uplisting or

split listing, nor need for an Animal Committee review or Significant Trade (SIG) Review. There is an unwritten understanding to hold a series of regional workshops and Kenya implied that this is not over with - just the first round (Jackson, 2004b.). Kenya had neither the backing of the key lion researchers (e.g., Packer was on the Tanzanian CITES delegation) nor the African range states, especially SADC countries, only the Western animal rights movement. The battle was won, but the ideological war between the urbanized West and resource dependent Sub-Saharan Africa is far from over.

Things are beginning to change in favor of sustainable use. At CITES COP 12 in 2002, Tanzania's leopard quota was doubled from 250 to 500 (CITES, 2002). At Cites COP 13 in Bangkok, Thailand, Namibia's leopard quota was increased from 150 to 250/year and South Africa's increased from 75 to 150/year. For the first time, South Africa and Namibia were each accorded five black rhino, the first time in several decades this species has been approved by CITES (CITES, 2004; SCI, 2004). Of course that does not mean that the USFWS will allow the black rhino, Endangered on the U.S. Endangered Species Act (ESA) list, into America (ESA, 1999). At COP 14 in June 2007, CITES approved the sale of elephant ivory exports from Botswana (20 tons of ivory), Namibia (10 tons) and South Africa (30 tons) that had been approved in 2002, but conditional upon the adequacy of Monitoring of Illegally Killed Elephants (MIKE). MIKE was determined to have been adequate (CITES, 2007a). This is also linked to a once off sale of ivory on top of this 60 tons from Botswana, Namibia, South Africa and Zimbabwe of all government-owned stocks that have been registered and verified as of 31 January 2007,

"of a single shipment per destination and may only go to countries whose internal controls on ivory sales have been verified as being sufficient by the CITES Secretariat...no new proposals for further sales from these four countries are to be considered by CITES during a 'resting period' of nine years that will commence as soon as the new sales have been completed" (CITES, 2007b).

The only major change at CITES COP 14, June 2007 is a doubling of the leopard quota in Mozambique from 60 to 120 and a new quota for Uganda of 28 trophy hunted leopard (Belinfanti, 2007). The real issue comes down not so much to trade but to where the profits go from the sales of these quotas. As stated, it is the people living on the land with wildlife who will determine its future. The question is how to give them a vested economic and cultural stake in its future?

10.9 CONCLUSION

The Convention on International Trade in Endangered Species (CITES) and the U.S. Endangered Species Act (ESA) have been tools used by the West to control and manipulate conservation and economic development based on the sustainable use of Sub-Saharan Africa's mega-fauna, which until the arrival of European colonizers in the 1500s had co-evolved in harmony with humans. The very people, who destroyed the lives of Africans and American Indians through colonization and the use of their wildlife as tools of conquest, now live in Western urban settings and no longer directly depend on living off of nature to survive. Within their society have evolved groups which pay homage to and worship wildlife, almost as a false god; the Western urban-based animal rights movements such as the Humane Society of the United States (HSUS), International Fund for Animal Welfare (IFAW), People for the Ethical Treatment of Animals (PETA) and the Defenders of Wildlife, among others. They and the Western governments, which they influence and/or infiltrate, believe that they know how to best conserve wildlife through controlling trade and by application of the "precautionary principle", which sends Western researchers to study Sub-Saharan Africa's fauna, while its people live in misery and in trying to survive are rapidly eliminating wildlife and its habitat.

Sub-Saharan Africa's approach has been "adaptive management" as described in the last chapter linked to generating economic value from wildlife as one incentive to conserve both habitat and species. This concept is in its infancy and still evolving, having been around for only about 20-30 years. Unfortunately, the idea of shooting a few (1-5% for trophies, 12-25% of the annual population for meat depending on the species) in order to give value to wildlife and its habitat to people still living off the land and who must decide, do they keep the wildlife/habitat or do they convert it into human-made systems (e.g., farms and pasture for livestock), disturbs these urban-based elites. Yet, let us take these once-removed Western urban dwellers into the forests of Cameroon or the other wilds of Africa, with nothing but the shirts on their backs and they too, within a week, will begin hunting and gathering and they too will conclude that the elephant that eats their crops and the cheetah that kills the game and livestock they are trying to live from must go, unless that elephant and cheetah provide them with a livelihood and help them survive, that is until they are no longer competitors for survival or liabilities, but assets.

CITES and the ESA assume regulation through controlling trade will save "endangered species", some of which are far from being endangered on a continental and regional basis such as the African elephant. Meanwhile, the issues that are leading to the demise of elephant and most wildlife in general have little or nothing to do with trade and must be dealt with on the ground: 1) poverty, 2) failed centralized management systems, 3) inappropriate governance, 4) corruption at all levels of society, 5) lack of perceived ownership of natural resources by rural communities, 6) lack of adequate benefits (economic and cultural) to rural communities from elephant and other wildlife, 7) human and livestock populations that have increased up to 6.5 times or more during the 20th century, displacing wildlife and its habitat, 8) resulting habitat loss, 9) the

bushmeat trade, 10) inadequate alternative livelihoods (e.g., urbanization and industrialization) to take pressure off the rural resource base.

In all frankness, the average, little guy on the ground, has never heard of CITES and the ESA and could care less about them. Unlike the “fat and happy” Western urban elites, he is in a survival mode. He doesn’t have the luxury to think about conservation unless it is a “utilitarian conservation” that helps him and his family survive. As Andrea Turkalo, a researcher with Wildlife Conservation Society (WCS) in Dzanga Sangha National Park, Central African Republic,

“People in the forest live in such poverty that they do not have time to think about animal conservation...‘This country can’t run their health dispensaries. They can’t educate their children. How can you expect them to think about conservation?...’ ” (Tomlinson, 2007).

It is not controlling trade, which will endear him to wildlife or cause him to conserve endangered species. However allowing him to sustainably use endangered species and other wildlife as part of a rural portfolio needed for survival and development may provide a glimmer of hope that attitudes towards wildlife will change from viewing it as a short-term to a long-term resource. Then wildlife and its habitat have a chance of surviving.

When the issue is trade, very often CITES and the ESA have the opposite impacts that are desired by 1) creating black markets, which cannot be regulated as opposed to controlled trade, 2) causing the land owner to shoot, shovel and shut-up, eliminating his perceived competitor and/or 3) the conversion of wild areas of little perceived value into farms or overgrazed pasture. Of special significance is trophy hunting of the African elephant (threatened on the ESA) and species like the cheetah (endangered on the ESA), but which has healthy populations in some countries, especially Namibia, and black rhino (endangered on the ESA). CITES

trophy hunting quotas exist for these species in some countries. Because of their listing on the ESA as “endangered”, the cheetah and black-faced impala in Namibia, the black rhino in Namibia and South Africa, and the leopard in West, Central and North Africa are not allowed into the USA. The U.S. also uses “stricter domestic measures” linked to the ESA to stop countries where the elephant is on CITES Appendix I (e.g., Cameroon) from coming into the USA.

If America and Europe want to save endangered species and other wildlife, they are “missing the boat”. They need to go after corrupt governments, governments who refuse to devolve ownership of natural resources to the landowners – rural Africans. The West must look at itself, plundering Sub-Saharan Africa’s raw resources, when it could take pressure off of wildlife and its habitat by transforming these products in Sub-Saharan Africa, helping to create an urban middleclass. Finally, they need to assure a critical mass of educated youth from these rural areas, which as described under CBNRM (Chapter 9) have the ability to manage and market wildlife for their people in order for rural communities to obtain the added value of wildlife on the international market. When wildlife starts putting food on the table, building needed infrastructure (e.g. schools, clinics, boreholes, etc.), when people’s cultural needs are reintegrated into the management of wildlife, and they see it as helping to improve their physical and spiritual quality of life, then wildlife might have a chance of surviving the 21st century. Trying to save endangered species through controlling trade via CITES and the ESA, results in nothing more than “feel good” policies, that actually do more harm than good for Africans and Sub-Saharan African wildlife. Ultimately, as currently implemented CITES is a slap in the face to the 1980 World Conservation Strategy (OECD, 2003) and the updated version *Caring for the Earth: A Strategy for Sustainable Living* (IUCN/UNEP/WWF, 1991) that while supporting the preservation of genetic diversity, also encourage sustainable use of natural resources to the benefit of mankind.

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Chapter 11

11.0 “INDEPENDENCE”, “DEMOCRACY” AND FOREIGN AID DEPENDENCY, IMPACTS ON CONSERVATION AND DEVELOPMENT IN SUB-SAHARAN AFRICA

“Let us remember that the main purpose of foreign aid is not to help other nations but to help ourselves” (President Richard M. Nixon, 1968 *In: McCully*, 2001).

“Yet most foreign aid is not about beneficence, but about power...powerful institutions encode their doctrines and impose them on the less powerful...since 1980, as aid doctrines and coercive practices have intensified in Africa, rates of recorded growth have turned negative and rates of progress in well-being have declined...The aid system can be made to change – but only if publicly shamed, prodded and cajoled into doing so...Posing as a solution, foreign aid has become a problem...a supporting actor masquerading as a star” (Sogge, 2002a).

“Between 1960 and 1986, the Western donors spent US\$ 116 billion in Sub-Saharan Africa (SSA). Better used, that might have been plenty. A lot went back to donors, paid out to experts for dubious advice. Africans stole some and wasted some more. Some of it went to badly conceived projects which ruined good land and dispersed productive societies. And even more went to prop up corrupt, tyrannical and simply inefficient governments” (Rosenblum & Williamson, 1990).

The next three chapters on foreign aid, subsidies/structural adjustment (SAP)/debt relief and the private sector in Sub-Saharan Africa, deal with how the West has related to post-independent Sub-Saharan Africa and the impacts this is having on sustainable development and the natural resource base. These chapters also begin to look at the way forward, which will be discussed in the final chapter of this book.

11.1 WINDS OF CHANGE

These famous lines, “Winds of Change”, by British Prime Minister Harold Macmillan came easily to the Francophone countries where there had been a small European presence, but strong cultural and educational ties with France. By 1960 only Guinea-Conakry chose to take independence and break its ties to France, while the remainder of the countries (e.g., Senegal, Mali, Upper Volta, Congo Brazzaville, Chad, the Central African Republic, Cameroon, etc.) took independence while remaining part of the French community tied to a common currency. However, change was often hard in coming to the white settler colonies such as Kenya, Southern Rhodesia (today's Zimbabwe) and South Africa. The Portuguese colonies, until the 1930s, had a colonial policy of “exploitative neglect”, where Africans were left alone. However, following WWII, Portugal encouraged European settlement, creating a situation where Africans were kept in near servitude with little opportunity for an education and socio-economic advancement. The Portuguese government, itself a dictatorship, saw its colonies as provinces and refused to give them up to independence, resulting in an armed struggle in Angola by 1961, Guinea-Bissau by 1962 and Mozambique by 1964, while Portugal spent half its annual budget on military control of its colonies. This resulted in an anti-colonial feeling back home and eventually a coup *d'etat* in April 1974 with a more reform minded military regime, which abruptly gave Guinea-Bissau independence by 1974, followed by Mozambique and Angola in 1975 (Martin & O'Meara, 1995).

11.2 END OF COLONIALISM

Lowenthal (1997 *In:* Griffiths & Robin, 1997) believes that,

“Lands long given up to imperial enterprise suffer by imperial withdrawal for two related reasons. Unless their economies remain neo-colonial, they are ill equipped to bear the loss of habitual modes of employment. Nor can they rapidly overcome habits of dependence ingrained by long subservience to the will as to the interest, of others. The plight of ex-imperial Africa today exemplifies these problems”.

11.2.1 Educational Status of Sub-Saharan Africa at Independence, an Impediment to Progress

Prior to 1945, less than 1% of the African population had full political and civil rights. Education was available to less than 5% of the population (Martin & O’Meara, 1995; Leistner, 2004). As noted, a small black elite was educated at a higher level. In the Francophone colonies, they were accorded the full rights of citizens, but had to accept *assimilation*, rejecting their heritage, family law and customs, to become black Frenchmen (Meredith, 2004) (see Chapter 3, Section 3.1.4.1, Francophone colonial Africa).

In the late 1950s, just as independence began, Sub-Saharan Africa with a population of 200 million had only 8,000 secondary school graduates, half of which came from Ghana and Nigeria. Only 3% of the student age population obtained a secondary education and 33% a primary education. French colonies had no universities. More than 75% of the manpower in government and private business were foreigners (Meredith, 2004). Just after independence in 1965, Zambia had only 100 university graduates, 1,500 people with a full secondary education and 6,000 with two years of secondary school (Dumont, 1966). Some

countries like Belgium had an ant-education policy with the slogan, “no elites, no problems”, not changing until 1955 (Dumont, 1966). In the Congo Belge, the majority of the population was afforded a primary education only, with secondary training available only at Catholic seminaries (Meredith, 2004).

In many cases, the peasants had been trained to obey rather than think and understand the purpose of their work, resulting in a major constraint to continued development in the post-independent period (Dumont, 1966). Even in the 1990s, when the principal author lived in Nairobi, an exchange student from America at the University of Nairobi explained how testing was undertaken based on rote memorization as opposed to testing one’s ability to understand, conceptualize and think; remnants of the colonial era. The lecturer would read from notes, close his book and walk out with little or no discussion or exchange with students. Leistner (2004) believes this form of education must change in Sub-Saharan Africa if it is to compete in a fast moving global society.

Sub-Saharan African countries were expected to transition smoothly from colonialism to independence, running sophisticated Western governments and economies with a “thin shell of educated” people (Dumont, 1966). Neither British Prime Minister Harold Macmillan nor Colonial Secretary Iain Macleod believed that Sub-Saharan African colonies were ready for independence, most being poorly educated, economically weak and ill prepared. However much they feared the advance of communism, to drive nationalism back would be to drive it into the hands of communism (Meredith, 2004).

11.2.2 Economic Viability of Sub-Saharan African Countries at Independence

The first President of Senegal, Leopold Senghor, was against the two French federations [French West Africa and French Equatorial Africa/*Afrique*

Équatoriale Francaise (AEF)] being broken up, fearing that as independent countries they would be too small, divided and therefore, dependent. This is just what France desired, not intending to permit federations of African territories to develop “with enhanced powers, capable of wielding significant influence in the metropolitan parliament” (Meredith, 2004). René Dumont (1966) was worried by what he called the balkanization of Africa, i.e. the creation of many countries, each with its own governmental administration that would hamstring the continent, destining it to failure as the resource bases and economies of African states were too small for each to sustainably support Western state bureaucracies, left behind as a result of colonialism. Attempts at industrialization through import substitution failed, as any one country’s market was too small to achieve economies of scale (Meredith, 2004) (see Chapter 12, Section 12.7.1.1, Import substitution and Section 12.9.3, Role of Sub-Saharan African Governments in Diversification through Industrialization). René Dumont (1966) gave an example of Gabon with 450,000 inhabitants having 65 deputies, or one each to 6,000 people compared to one per 100,000 in France. A deputy in Gabon was paid more than a British member of parliament and earned in six months as much as the average peasant did in 36 years (Dumont, 1962 *In:* Meredith, 2004). The majority of national budgets went to salaries, leaving little left over for actual development or functioning of bloated bureaucracies representing a small elite in relation to the total populations of these countries. In 1964, examples of the percentage of national budgets going to civil service salaries were (Meredith, 2004):

- 47% in Senegal;
- 58% in the Central Africa Republic and the Ivory Coast;
- 62% in Congo Brazzaville; and
- 65% in Dahomey (Benin).

Leistner (2004) raises similar concerns with national economies, often no bigger than a European municipality, unable to afford the essential elements of modern states including legislatures, government machinery, foreign embassies, independent currencies and armies. Economies of scale then become a problem. What finances were left over were often abused by these elite. In 1964, in 14 Francophone countries, more was spent on importing alcoholic drinks than importing fertilizer (Meredith, 2004).

11.3 NEO-IMPERIALISM IN SUB-SAHARAN AFRICA

Imperialism, as defined by Webster (1989), is a

“Policy forming and maintaining an empire in seeking to control raw materials and world markets by conquest of other countries, establishment of colonies and seeking to dominate economic and political affairs of underdeveloped areas or weaker countries”.

During the pre-colonial period in Sub-Saharan Africa, European traders using superior military power extracted monopolistic trading rights from chieftains and kings in a pattern of trade based on plunder. During the colonial period, this continued with extension of sovereign control of one state over another. Postcolonial imperialism has been based on economic control from afar through international organizations and treaties capable of steering the economies of the ex-colonial territories indirectly and safeguarding the proprietary interests of foreign investors, while generating a new pattern of extraction through resource bondage, technological rents and debt-peonage (Hoogvelt, 2002 *In: Zack-Williams, Frost & Thomson, 2002*).

Capitalism, as defined by Webster (1989), is an economic system where most of the production and distribution (e.g., land and factories) is privately owned and operated for profit, a concentration of wealth is invested into the growth of great

corporations and there is an increase in government control. Imperialism is an agenda of capitalism in which wealth from some areas, groups or people benefits from the transfer of economic surpluses and hence, the under-development of other areas, groups and peoples (Hoogvelt, 2002 *In: Zack-Williams, et al.*, 2002).

Jules Méline, the French protectionist Minister of Agriculture, on March 8th, 1899, wanted

“to discourage in advance any signs of industrial development in our colonies, to oblige our overseas possessions to look exclusively to the mother country for manufactured products, and to fulfill, by force if necessary, their natural function, that of a market reserved by right to the mother country’s industry” (Dumont, 1966).

The more things change, the more they remain the same.

Although direct control through political colonialism largely ended by about 1960 in much of Sub-Saharan Africa, the West began using economic relations to indirectly control Sub-Saharan African politics, economies and access to Sub-Saharan African resources. Neo-imperialistic tools and policies, such as foreign aid and structural adjustment (SAP), were used to continue meeting Western capitalistic demands, as opposed to exporting capitalism to the developing world (see Section 11.6.7, Foreign Aid and Puppet Governments – “Donor Democracy”). As a result, the West developed economically, while the developing world continued to spiral out of control down a slippery slope to anarchy and poverty.

Given the nature of Sub-Saharan Africa’s colonial experience, the rich pre-colonial history of well-ordered societies and complex inter-communal relations, it seems peculiar that at the time of independence, African nationalists would espouse the European state as the most appropriate form of political community

(Davidson, 1978; 1992; 1994 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). Dixon (2002 *In: Zack-Williams, et al., 2002*) argues that the educative function of civil society ensures the hegemony (domination) by the elite and the legitimacy and stability of the status quo by persuading the masses to accept the political values and discourses of elite groups. A small number of urban and tribal elites received a European education both within the colony and in the colonial metropole, producing a stratum of African society conversant in the language and political discourse of the colonial state and the Western philosophy of political community. The basis of the post colonial state in Sub-Saharan Africa was the colonial state, independence not constituting a total break with colonial political values (Dumont, 1966; Dixon, 2002 *In: Zack-Williams, et al., 2002*). African nationalists were strongly committed to maintaining the states created under colonial rule (Chazan; Mortimer; Ravenhill & Rothchild, 1988 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*).

Educational programs were begun in the 1950s to train African administrators to run the postcolonial states, while indoctrinating them into Western ideas about proper political practices, values and ideas about community. The explicit objective driving colonial education was the desire to establish hegemony of the state in African civil society (Young, 1988 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). Adjiboloso (1995 *In: Leistner, 2004*) believed that colonization was a process of socialization by European powers to make subservient and serviceable Europeans out of Africans.

British colonial policy was “nation building”, something believed beyond the capacity of Africans themselves (Davidson, 1992 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). Even prior to the development of formal imperial rule in West Africa in the 1880s, from Lagos to the Gambia, westernized Creole elite were sending their sons and daughters to school in London. As briefly discussed

in Chapter 5 of this book, this western-educated few living in urban settings are distinguished from the many living in the rural environment (Davidson, 1978 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). This western-educated few played a major role in anti-colonial nationalist movements, but had been educated and assimilated into colonial civil society (Chabal, 1992 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). The rural masses were often isolated from and segregated by this system, herded like cattle into homelands to make way for colonial settlers or were forced into “slave labor” for plantations and mines and/or to produce cash crops for the colonies. Thus, two different worlds were emerging, a dichotomy of an urban elite linked to Europe and the rest of Africa. Traditional authorities were eventually co-opted by the colonial powers and post independent elites, resulting in many traditional chiefs having a greater affiliation for the state than to their own constituencies – rural villagers.

African nationalist leaders and intellectuals, as a result of the colonization of the African political consciousness, adopted the concept of the nation-state based on the European model. No alternative could be thought of (Hobsbawm & Ranger, 1992; Anderson, 1991 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). Meanwhile, historical Sub-Saharan African political communities were dispossessed by the European colonial powers as being uncivilized, unfit and incapable of self-government; a continent, which prior to the arrival of the Europeans was without a history of state and society (Davidson, 1994 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). Thus, the development of “The White Man’s Burden”, equipping arbitrarily constructed societies with European-style, political, social and national institutions (Hobsbawm & Ranger, 1992; Anderson, 1992 both *In: Dixon, 2002 In: Zack-Williams, et al., 2002*).

Take up the White Man's burden –
 Send forth the best ye breed-
 Go bind your sons to exile
 To serve your captives' need;
 To wait in heavy harness
 On fluttered folk and wild –
 Your new-caught, sullen peoples,
 Half devil and half child...
 (Kipling, 1899 *In: Rosenblum & Williamson, 1987*).

In fact, Mamdani (1994 *In: Leistner, 2004*) and Dixon (2002) argue that anti-colonial movements and African intellectuals can be considered the means by which European political-cultural hegemony was maintained long after decolonization due to alienation by these intellectuals of Africa's own rich history of pre-colonial political culture. The 50 or so states of the colonial partition were governed as though their people possessed no history of their own and became nation-states formed and governed by a political elite on the European model mainly of Britain and France. Liberation produced its own denial and led to alienation of the masses (Davidson, 1992 *In: Dixon, 2002 In: Zack-Williams, et al., 2002*). This is reflected today in conservation policies, which continue to separate the masses in rural Sub-Saharan Africa from their natural resources and associated wealth based on a Western exclusionary model, the only difference being that the state has replaced the colonial power.

Some visionaries have attempted to combine the idea of nation state with more traditional systems and decentralization of power, decision-making and economic development such as the House of Chiefs in Botswana, Moise Tshombe's attempt at federalism (see Section 11.6.6.1, The Katanga story, an “African Solution” to democracy thwarted by the “Cold War” and beginning of French/American struggle over a quest for Africa's riches), Yoweri Museveni's bottom-up no party democracy government (see Section 11.6.6.2 Uganda, democracy, civil war and

attempts to find an African solution) and South Africa's attempt at federalism (see Section, 11.6.6.3, South Africa's democracy, a possible decentralized model adapted to Africa). As described in Chapter 9, conservation movements in Africa attempting to empower communities (e.g., CAMPFIRE, ADMADE, Botswana Community Trust Program, WMAs in Tanzania and *Gestion des Terroirs* in Burkina Faso) are attempts to address this issue. Their long-term success will be dependent on the willingness of the state to divest itself from direct domination over associated natural resources, and the accrued benefits from sustainable harvesting of these resources.

Many citizens of these unrepresentative Sub-Saharan African states have disengaged themselves from the state, seeking to avoid the unacceptable decisions over which they have no control, evading taxes and duties, ignoring its regulations of employment, disregarding its edicts outlawing traditional practices (e.g., traditional hunting, grazing cattle inside national parks – many being former traditional dry season grazing areas for pastoralist communities, etc.), and deriding governments that imagine they can decree what they should grow, where they should live, how they should treat their women and what they should believe. Unaccountability of the state to its citizens has become institutionalized in Sub-Saharan Africa (Baker, 2002 *In: Zack-Williams, et al.*, 2002), while the masses are asked to be accountable to the state.

11.4 ECONOMIC DEVELOPMENT AT INDEPENDENCE

“Colonizers had pushed aside civilizations that were functioning in Africa when French kings ate with their fingers. They ruled African possessions with an authoritarian hand. On departure, they expected fledgling states to adhere to institutions that Europe had not perfected in a thousand years. The result was hardly a surprise. Small elites seized power and kept it. Tribes squared off and winners took all. Western and Eastern blocs lined up friends by bankrolling the ruling elites”, (Rosenblum & William, 1990).

The durable imprint of authoritarian regimes was left behind at independence in which governors and other officials wielded tremendous power (Meredith, 2004).

Instead of being characterized by self-sustained development, the first three decades of independence on the subcontinent were marked by the steady exacerbation of under-development, poverty and inequality. By 1990, the continent's total debt burden stood at US\$ 272 billion, two and a half times what it had been ten years before, an equivalent to 90% of Africa's Gross Domestic Product (GDP).³⁴⁵ Sub-Saharan Africa's

"total income is not much more than Belgium's, and is divided among 48 countries with median GDPs of just over \$US 2 billion—about the output of a town of 60,000 in a rich country" (World Bank, 2000).

Between 1985 and 1990, Sub-Saharan Africa paid out more in interest and debt repayment to the IMF and World Bank combined than it received from them in the form of loans and grants (Martin & O'Meara, 1995). Africa's per capita GDP fell from US\$ 671 in 1975 to US\$ 245 by 1997, most Africans being worse off than 25 years earlier. Sub-Saharan Africa's share of world trade slumped from 3% in 1950 to 1.5% in 1999. While Africa is dependent on the global economy, it is being marginalized by the global economy (Zack-Williams, 2002 *In: Zack-Williams, et al.*, 2002). Jeffrey Sachs (2005) found a strong correlation in that the probability of a country being democratic rises significantly with increasing per capita GDP, while declines were significant predictors of state failure. Most of Sub-Saharan Africa is experiencing negative per capita GDPs (see Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA & Chapter 13, Section 13.1, CURRENT STATE OF AFRICAN ECONOMIES).

³⁴⁵ See Footnote 48, Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA.

Africa's economic policy, as we shall see, was a combination of the West's creation of dependency with sometimes politically incompetent leadership, along with non-representative governments that were or are corrupt and inefficient (Martin & O'Meara, 1995).

The development strategy of the new governing classes was "Business as Usual" with a strong dependency on imported manufactured goods, while exporting raw products (Zack-Williams, 2002 *In: Zack-Williams, et al., 2002 & Chomsky, 1999*).

For the most part, colonial laws, which disenfranchised the masses from their natural resources, were converted to state laws at independence to the benefit of the new political elite running these countries, which many Westerners mistakenly believe have the interest of their people at heart. With few exceptions, the only real difference between colonialism and independence was that the skin color of the "master" changed from white to black. Uneducated, the majority of Sub-Saharan Africa's citizens have insufficient knowledge to hold their leaders accountable. The leaders had often been puppets of Western Governments during the Cold War and are still possibly today of multi-nationals, allied to Western Governments, plundering the continent's resources at the expense of the people. The controversial MIT, Professor Noam Chomsky³⁴⁶ (1996), expresses this relationship,

"Little will change from the occupation period", he predicts, "except that...control will become less direct: instead of running affairs up front,...'liaison officers' will run them via the clerks of the...Authority. Like Britain during its day in the sun...will continue to rule behind 'constitutional fictions.' No innovation of course; that is the traditional pattern of the European conquest of most of the world".

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Sankore (2005) states that the net result of Western intervention has been

“the shaping and entrenchment of economic development frameworks designed to benefit multinational exploitation of resources, and imposition of government bureaucracies to perpetuate such frameworks”.

Countries like Malawi and Mozambique retained quasi-colonial status as economies of reserve labor for mines in South Africa. West Africa, which had exported some 20 million of its people in the previous four centuries as slaves, continued the process of deskilling by exporting hundreds of its most skilled personnel each year to Europe and North America (Zack-Williams, 2002 *In: Zack-Williams, et al.*, 2002). During his tenure as regional environmental advisor to USAID in the Caribbean, a high level U.S. State Department employee in British Guyana explained that the unofficial policy of the U.S., in order to maintain its global competitive edge, was to seek out the “best and the brightest” from the rest of the World, provide them with scholarships and hope that many would never return to their country of birth, helping to fuel America’s global technological advantage (see Section 11.13.1.2, What kind of education). This is becoming more and more of a reality as American scores in math and science plummet and the country becomes more and more reliant on foreign students to fill the universities in engineering and the sciences. Meanwhile, the European Union, with an aging population that cannot fill its professional and skilled-labor demand, is issuing a “blue card”, virtually planning to steal the best and brightest from the developing world. Why would many want to return to the developing world, where salaries and standards of living are lower and opportunities restrictive – in many cases non-existent?

New nations were artificial creations bearing little relation to traditional political entities, the idea of a nation state being a foreign concept to Sub-Saharan Africa,

an unnatural union (Oyowe, 1991 *In:* Leistner, 2004). At independence, the new states were not nations - possessing no ethnic, class or ideological cement, nor strong historical and social identities on which to build and to hold them together. Pre-colonial Sub-Saharan Africa had been a mosaic of lineage groups, clans, villages, chiefdoms and empires, often with shifting and indeterminate frontiers, loose allegiances with languages and identities shaded into one another. Colonialism helped define tribe and ethnicity, creating clear frontiers often artificially divided along geographical boundaries (e.g., rivers, mountain ranges) with recognizable tribal units that could be governed. Tribal labels were often imposed on undifferentiated groups and chiefs appointed by colonial administrators as their agents and symbols of ethnicity. Sub-Saharan Africa inherited these states based on extremely fragile links, which due to colonialism enhanced ethnic consciousness – the tribal factor becoming more potent than it had ever been (Meredith, 2004).

Ethnic groups, often traditional enemies, were suddenly expected to feel and behave as a nation. The new states suffered a serious defect, lacking loyalty of a unified people. Loyalty abided with the ethnic group (Leistner, 2004). It would be analogous, 50 years ago, to expect unification of the French and Germans into one country.

National consciousness was replaced by ethnic bigotry, clientelism and institutional corruption. The democratic structures inherited from the departing imperial power were soon destroyed in favor of one-party states, controlled by what some call *petite bourgeoisie* or the elite.

African nationalism had a liberating façade, but ended up in alienation, as political freedom failed to restore Sub-Saharan Africa's own history, unlike Japan, which was able to take the good from the West without jeopardizing its

cultural integrity. Sub-Saharan Africa's modernization has so far alienated Africa from itself in implementing the "imperial model" or "foreign model" which asserts that nothing in Sub-Saharan Africa's (past) experience is valid for the future. Statism became central to the new model of collective identify and the so-called "Chiefs", who in the past were the guardians of the people, their self-respect and traditions (Zack-Williams, 2002 *In: Zack-Williams, et al.*, 2002), have become the "Big Men" the "President's for Life" who exploit their people. Instability became the status quo, as those aspiring to become "Big Men" and their constituents vied to control each nation's wealth of natural resources. From the early 1960s to the late 1980s, the continent had more than 70 coups *d'etat* and 13 presidential assassinations (Shiner, 2004) (see Section 11.6.3, Neo-Patrimonial Clientelism, the Big Man and "Cosmetic Democracy").

By the end of the Cold War (1989), there was a reassessment of foreign policy towards the south, with a shift away from supporting authoritarian regimes to stressing the role of civil society. In 1990, there were only four African countries where multi-partyism was allowed. There was Senegal, the Gambia³⁴⁷, Botswana and Mauritius (Shiner, 2004). The role of civil society in reforming African states and non-governmental organizations (NGOs) became the way forward for the donors in an attempt to rebuild failing African states from the bottom-up (see Section 11.9, THE NEW SAVIORS OF SUB-SAHARAN AFRICA; NGOs). Western intervention was considered legitimate (Hearn, 2002 *In: Zack-Williams, et al.*, 2002). Hearn (2002 *In: Zack-Williams, et al.*, 2002) also believes the definition of civil society and its role in minimizing state intrusion into private life or abuse of power is too simplistic. In many cases, it implies the growth of NGOs to meet social needs outside the realm of the state. Ironically, Hearn (2002 *In: Zack-Williams, et al.*, 2002) believes that it is the urbanized and educated state employees, such as teachers, doctors, lawyers, university staff, nurses and other

³⁴⁷ The Gambia has since had a *coup d'etat* by a junior military officer and current president, Yahya Jammeh.

civil servants who are the most likely sources to galvanize citizens to use the rights they have to organize and protest against bad governance.

Of course, the West did not ask itself how this “monster” of failed-nation states was created and its own culpability in the current situation facing Sub-Saharan African states. Although, one could argue “too little too late”, with the end of the Cold War and without alternative sources of support, the Western donors and International Finance Institutions (IFIs) were basing funding more and more on conditionalities such as good governance, rule of law, multi-party elections and a basic democratic process.

11.5 AFRICA UNRAVELS – STATE LED DEVELOPMENT

“Africa’s greatest problem may be the enduring myth that Africans are unable – or somehow unwilling – to improve their lot. The continent teems with economists and agronomists, entrepreneurs and investors, peasant farmers and laborers, all anxious to build prosperous states. Most are blocked from above and below, and their frustration is yet another African tragedy”, (Rosenblum & Williamson, 1990).

“The African crisis is not the failure of the people nor the failure of Americans to feed a starving continent. It is basically the failure of state-oriented enterprises” (Burkinabé Pierre-Claver Damiba, former African Director for UNDP *In: Rosenblum & Williamson, 1990*).

In the case of conservation and wildlife, Majamba (2001) concludes that at independence African governments retained most colonial wildlife laws and institutional set-ups. This ensured the continued exploitation of the hunting industry for the benefit and interests of the international trophy market, with the government being the conduit pipe. Inheriting the colonial laws and policies meant the inheritance of hostility between the government and local community members. Rural communities continued to be denied access to resources in

colonially created national parks and game reserves from which they had been forced to re-locate, sometimes by compulsion, leaving their ancestral lands and abandoning their age-old hunting practices. In adopting the colonial hunting laws and policies, newly independent governments retained policies based on alienating and marginalizing local community members from the hunting industry. Communities living in the vicinity of safari hunting areas continued to resent efforts to develop the hunting industry. After independence, most local people's interests were still not considered paramount by Sub-Saharan African game and park departments. They saw no benefits from safari hunting or ecotourism as a conduit for generating revenue to improve their (local peoples') living standards (Majamba, 2001).

“African Capitalism” at independence attempted to use “neo-colonialism” as a development strategy, relying heavily on Western foreign aid and foreign investments to develop their economies to promote both industrialization and large-scale agriculture. Afro-Marxist regimes such as Tanzania and Guinea-Conakry tended to align themselves with the Soviet Union and Eastern Bloc.

In 1960, following independence, ambitious leaders promising prosperity invested in public controlled industries - Import Substitution Policy, absorbing large amounts of government revenue. These were often promoted and supported by donors and International Finance Institutions (IFIs) (Martin & O’Meara, 1995). Initially many donors supported a development model in the Third World that backed autocratic regimes and the finance of state apparatuses (e.g., inefficient and corrupt state parastatals that took the place of the private sector) in an effort to overcome what had been perceived as internal blockages (e.g., lack of a local entrepreneurial business class) (Hoogvelt, 2002 *In: Zack-Williams, et al.*, 2002). Senegal had 100 parastatals employing four times the manpower needed. Many parastatals became part of the patronage systems that developed, providing

political favors or jobs for the extended family. By the 1980s, Sub-Saharan Africa was de-industrializing as foreign investors looked to more promising markets in Asia and Latin America (Meredith, 2004).

Leistner (2004) argues that the political elite, in order to maintain their lifestyles after independence, continued to serve the interests of the overseas powers (e.g., raw products for the Mother country). They thus used the state to control the means of production without ownership, allowing them to exploit others without appearing to be capitalists. Reno (1995 *In:* Hoogvelt, 2002 *In:* Zack-Williams, *et al.*, 2002) describes the development of the “Shadow State” of unofficial and illicit ties that bind the interests of state officials, rulers and rival strong men with foreign commerce and investors. Babu (1985 *In:* Leistner, 2004) calls these elite, “economic hijackers”, delivering their countries into a new form of colonial bondage where the mass of people live in poverty, while the elite live apart in a world of conspicuous consumption and materialism. As Leistner (2004) puts it,

“Whereas the poor showing of African leadership is generally known, it is less generally appreciated to what extent the rest of the world, and more particularly the West has contributed to that state of affairs”.

This resulted in economic stagnation or backsliding, with no incentive to see economic progress, education of the masses or the creation of a majority middleclass that would increasingly demand a share in the wealth generated from these resources. This concept will come out very strongly in Chapter 13 on the international private sector in Africa.

Thus, it has never been in the interest of Sub-Saharan Africa’s political elite to institutionalize the state in a Western sense. It also becomes imperative to exploit government resources for patrimonial purposes, as opposed to the Western model of state in which office holders lose all right of ownership to public goods. The

elite was or is not interested in promoting development because, through the state, political power gives access to all the wealth they need (Leistner, 2004).

Development would mean an educated majority middleclass that would no longer accept the squandering of a nation's wealth on a few. Many Sub-Saharan African leaders feared the development of capitalism, as the emergence of a strong class of private businessmen could threaten the position of the elite, and an economic power, tends to be a pathway for political power. Therefore, capitalism was deliberately confined to small-scale operations (Leistner, 2004) such as the market economies one sees throughout the subcontinent. Examples of leaders who put the breaks on the emergence of a powerful private sector include Nkrumah of Ghana, Joseph Désiré Mobutu Sese Seko of Zaire, Houphouët-Boigny of Côte d'Ivoire (the Ivory Coast) and Senghor of Senegal (Boone, 1998 *In:* Lewis, 1998 *In:* Leistner, 2004).

Ayittey (1998 *In:* Dixon, 2002 *In:* Zack-Williams, *et al.*, 2002) argues that: 1) Predatory elite rule, and 2) Statism lie at the heart of Africa's ongoing crisis. Guest (2004) argues predatory, incompetent governments impoverish Africans through corruption, bad economic policies and intimidation or terror tactics, especially to any opposition that scare off potential investors. The state as the only resolution of community remains central to African political thought, effectively de-legitimizing the non-state versions of community, thus trapping Sub-Saharan Africa in the political culture of the empire (Dixon, 2002 *In:* Zack-Williams, *et al.*, 2002). Davidson (1992, *In:* Guest 2004) believes that the state failed to obtain legitimacy in the eyes of the majority of Africans, benefiting only a small elite. To defend themselves against the illegitimate state, they turned towards tribalism, which in a political setting of Western imposed nation states turned into clientelism, a system of patronage linked to personal, family and similar networks. He believes that the problem in modern Africa lies not in

tribalism, but in its politicization, dating back to its manipulation by colonial authorities (see Section 11.6 AFRICAN DEMOCRACY IN THE 20 AND 21ST CENTURIES).

These elite, in cahoots with Western government and multi-nationals, extract the wealth of rural communities (e.g., wildlife both consumptive and non-consumptive, minerals and timber). With little or none of the wealth circulating in rural areas, there is no buying power, little money exchanging hands and therefore no knock-on effect of wealth demanding the production of various products that could lead to industrialization. Most wealth either stays in Sub-Saharan African capitals with the elites or flees overseas resulting in stagnant or declining economies in Sub-Saharan Africa on the richest continent in the world. There is little investment in providing basic services such as infrastructure, health care or universal education (see Section 11.6.3, Neo-Patrimonial Clientelism, the Big Man and “Cosmetic Democracy”).

Soon pre-colonial trade routes were being reopened by the impoverished peasant populations seeking to minimize exploitation by smuggling cash crops (e.g., cocoa in Ghana in the 1960s and 70s, coffee, ginger and cocoa in Sierra Leone and coffee in Uganda) and even livestock across national boundaries. Corrupt marketing boards under-paid peasants for their cash crops while maximizing their profits on the world market (Zack-Williams, 2002 *In: Zack-Williams, et al.*, 2002). In the 1980s, the principal author recalls in the Fouta Djallon of Guinea-Conakry, seeing livestock being temporarily moved across borders in order to avoid paying government head taxes.

A fine example of state led development is Senegal’s SAED, a government parastatal that has unsuccessfully been behind large-scale irrigation schemes linked to dams on the Senegal River and the loss of traditional production

systems, impoverishing the masses (see Chapter 7, Section 7.10.5.1, Senegal River and Chapter 12, Section 12.4.4.1, Impacts of structural adjustment (SAP) on peasant farmers along the Senegal River). Little and Watts (1994 *In: Berry, 1995 In: Martin & O'Meara, 1995*) and Ayako and Glover (1989 *In: Berry, 1995 In: Martin & O'Meara, 1995*) made similar observations.

State led development spawned a series of interventions including:

- Erection of Tariffs and other Import Controls;
- Domestic Subsidies on Food Staples and Fuel; and
- Provision of Social Welfare Services such as health and education.

The latter two were often undertaken in excess of the financial capacity of the state. State led development also buttressed a growing, poorly paid bureaucracy (the main source of employment into the 1970/80s for most educated people, as the formal private sector, was significantly absent), fed a kleptocratic elite and made corruption at all levels an endemic feature (Hoogvelt, 2002 *In: Zack-Williams, et al., 2002*) (see Section 11.7.6, Foreign Assistance and African Governments, the Major Employers in Post-colonial Africa). The negative side of state led development was condoned by the Western donors because of the Cold War (strategic), everything else being ignored as long as these failing states sided with the West.

State parastatals were mismanaged, requiring more borrowing and increasing debt (see Chapter 12, Section 12.3.4.2, Structural adjustment and privatization of parastatals), while rural-urban migration increased as human (see Chapter 5, Table 5.12: Existing and projected populations in Africa and Sub-Saharan Africa) and livestock (see Chapter 6, Table 6.2: Livestock numbers Sub-Saharan Africa, 1961-2003) populations, with modern-day medicine and veterinary care increased

up to 6.5 times in the 20th century, outstripping the ability of many of Africa's fragile ecological systems to support them (see Chapter 5, AGRICULTURE IN SUB-SAHARAN AFRICA (SSA) SINCE COLONIALIZATION). A review of 30 years of agricultural spending, beginning in the mid-1970s, indicates that this had a largely negative effect, resulting in a decline in efficiency and honesty of the parastatal agencies. Much of this attributed to large and poorly-controlled aid inflows during the period (Friis-Hansen, 2000 *In:* Sogge, 2002a).

As today, the urban centers had neither the infrastructure nor the jobs to support the large urban influx of poor uneducated peasants escaping increasingly degraded rural areas incapable of sustainably supporting the exploding rural populations. This turned many of Sub-Saharan Africa's urban centers into some of the worst slums in the world without adequate infrastructure (sewage, clean water, schools, clinics and roads) or jobs to provide an improved quality of life. The real jungles of Sub-Saharan Africa, where two-legged predators roam freely, are its urban centers where societal norms of the rural areas have broken down and crime has become a way of life (Kaplan, 1994). Kaplan argues that Sub-Saharan Africa lies at a historical bend in the river in that it could become the symbol of worldwide demographic, environmental and societal stress in which criminal anarchy emerges as the real strategic danger (Kaplan, 1994 *In:* Martin & O'Meara, 1995). This will only worsen as urban populations begin surpassing rural populations by 2020 (see Chapter 5, Section 5.7.5, Food Security and Urbanization in Sub-Saharan Africa) because

“the rate of urbanization is twice as fast as in Asia or Latin America, with only a moderate expansion in the productive economic base to support it...’premature urbanization’...Too often the result is life in slums, which in turn draws many – especially young people disaffected by exclusion from labor markets and other opportunities – into a slide of anti-social behavior and crime” (Commission for Africa, 2005).

In the face of a global recession and increase in political instability in Sub-Saharan Africa by 1980, foreign investment sharply declined in the subcontinent. By the mid-1980s, most Sub-Saharan African economies were caught in a double bind of falling per capita incomes, and spiraling foreign debts. In fact, Sub-Saharan Africa saw no increase in its per capita incomes between 1965 and 1999 (House of Commons, 2002). By the mid-1980s, 60% of Africa's countries were under military rule. Where democracy existed, it was an illusion. Human rights violations, official corruption and lack of government accountability were commonplace. By 1986, Africa was a continent in "economic free fall", with rampant poverty under-development, economic dependence, ethnic and class conflicts, absence of democratic practices and authoritarian regimes (Martin & O'Meara, 1995). Centrally controlled economies, inefficient government parastatals masking as the private sector and protected markets were failing and Sub-Saharan Africa was becoming "Donor Dependent", losing what little pride and dignity it might have had at independence. The

"donor dependency syndrome is seen as a major obstacle to development...has resulted in an erosion of initiative and lack of ownership of the development agenda...which has led...into unprecedented apathy" (United Republic of Tanzania, 1998 *In: Junge, 2004*).

Where Western investment took place, it was often based on unskilled poorly paid "slave labor", no environmental controls and often negotiated deals such as under-costed hydro-power, as described in Chapter seven on dams, or "sweet deals" cut with multi-nationals where a few elites were provided with Swiss bank accounts with regard to mineral and timber resources, maximizing the profits of the multi-nationals, with little or no concern for sustainability, or if any of this generated wealth was reinvested back into the country's people or infrastructure (see Chapter 13, THE CURRENT AND FUTURE ROLE OF THE PRIVATE SECTOR IN SUB-SAHARAN AFRICA, RESOURCES WARS OR NEPAD?).

While the world was at the peak of the Cold War, the East and the West were vying for control of Africa's rich resources. During the Cold War, the U.S. provided more than \$1.5 billion worth of arms to African countries that were considered geo-strategic allies. The U.S. also bankrolled dictators in African states, such as Mobutu Sese Seko in the former Zaire and Siad Barre in Somalia. It is many of these Sub-Saharan African countries that had "special" Cold War relationships with the U.S. that fell into political turmoil and violence in the 1990s and are often referred to as "failed states" (e.g., Liberia and Somalia) (Africa Action, 2003) and the DRC (former Zaire/Congo Belge).

The era of "political conditionalities" had begun, in which Western donors and International Finance Institutions (IFIs) began dictating economic and political policies to countries in return for grants and loans (Hoogvelt, 2002 *In: Zack-Williams, et al.*, 2002) (see Chapter 12 for details). This may be considered a legitimate form of interference in the internal affairs of sovereign states (Sogge, 2002b). African leaders and bureaucrats became masters at playing one donor off on the other and in signing "condition precedents" outlining various steps to be taken by a government or organization in order to obtain the loan or grant, or to write-off bad debts and then doing everything, but what was agreed on. Debt relief being talked about in 2005 is not new, but incestuous in Sub-Saharan Africa. Western donors and IFIs turned their heads, even to corruption, as long as the country stayed in line with their politics of the Cold War (see Chapter 11, Sections 12.5.2, 2005 Debt Cancellation and 12.5.3.1, Debt relief creates more debt).

11.6 AFRICAN DEMOCRACY IN THE 20 AND 21ST CENTURIES

“As my understanding of territory grew, I came to recognize the (Sub-Saharan African) independence movement included two serious flaws: First, the black nations accepting those arbitrary borders which had been drawn by the colonial powers in their splitting up of the world’s spoils. In the Congo, for example, a major tribe like the Bakongo was divided among European-derived entities known as Angola, the Belgian Congo and the French Congo; whereas, on the other hand, Katanga, a separate entity ethnologically, traditionally and geographically, had for conveniences of Belgian administration been placed within an area which all but the Congolese regarded as the Congo. And the second flaw, of course was that none of the new states resembled biological nations. Allegiances were tribal and local” (Ardry, 1966).

Even in the 21st century, it can be argued that in many countries, African governments still represent the interests of the political elite to the detriment of the masses. It can even be argued that under the guise of democracy, a politburo-like government elite live off the natural resources of the continent, while the true owners (small-scale rural societies) are disenfranchised and forced to live in poverty. Democracy becomes a façade for communist-like systems that are doomed to the ruination of the subcontinent. Thus, until resource/land tenure systems change and thus wealth distribution, can any form of governance be considered democratic in nature other than through superficial voting processes that have yet to change reality for most people on the ground?

An estimate of the democratic status of Sub-Saharan African countries at the close of 1999 is contained in Table 11.1, though based upon the above, one must be wary of the word “democracy” and what it really means – often a veneer of superficial elections, while a predatory elite, through the state continue to claim ownership over all natural resources and the sole right to economically benefit.

**Table 11.1: Democratic status of Sub-Saharan countries,
December 1999**

Country	2000	1950	1900	Country	2000	1950	1900
Angola	AR	C	P	Madagascar	DEM	C	C
Benin	DEM	C	C	Malawi	DEM	C	C
Botswana	DEM	C	C	Mali	DEM	C	C
Burkina Faso	AR	C	C	Mauritania	AR	C	C
Burundi	AR	P	C	Mozambique	DEM	C	C
Cameroon	RDP	P	C	Namibia	DEM	P	C
Cape Verde	DEM	C	C	Niger	DEM	C	C
Central African Republic	DEM	C	C	Madagascar	DEM	C	C
Chad	RDP	C	C	Nigeria	DEM	C	C
Congo Brazzaville	AR	C	C	Rwanda	AR	P	C
Congo (Kinshasa)	AR	C	C	Sao Tome and Principe	DEM	C	C
Cote D'Ivoire	AR	C	C	Senegal	RDP	C	C
Djibouti	DEM	C	C	Seychelles	DEM	C	C
Equatorial Guinea	AR	C	C	Sierra Leone	DEM	C	C
Eritrea	AR	P	C	Somalia	AR	C/P	C
Ethiopia	AR	CM	P	South Africa	DEM	RDP	RDP
Gabon	AR	C	C	Sudan	AR	P	C
Gambia	AR	C	C	Swaziland	TM	C	C
Ghana	DEM	C	C	Tanzania	RDP	P	C
Guinea-Conakry	AR	C	C	Togo	DEM	P	C
Guinea-Bissau	DEM	C	C	Uganda	AR	P	P
Kenya	AR	C	C	Zambia	AR	C	C
Lesotho	RDP	C	C	Zimbabwe	RDP	C	C
Liberia	DEM	RDP	RDP				
DEM = Democracy RDP = Restricted Democratic Practice CM = Constitutional Monarchy				TM = Traditional Monarchy AM = Absolute Monarchy AR = Authoritarian Regime		TOT = Totalitarian Regime C= Colonial Dependency P = Protectorate E = Empire	
Source: Freedom House (1999) with permission, Freedom House.							

The New York based policy institute, Freedom House, estimates that 18 (21 in Table 11.1) Sub-Saharan African countries can be considered genuine electoral

democracies. A dozen Sub-Saharan African nations have undergone peaceful transfers of power from one political party to another since 1990 (Shiner, 2004). As will be discussed below, multi-partyism, especially when there is one dominant party or an uneducated and often terrorized electorate, does not necessarily mean democracy or representative governance. Senegal and Kenya appear to be moving towards what one might call a democracy – though the disputed 2008 Kenya elections call this into question (See Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya), while other so-called democracies such as the Central African Republic and Sierra Leone have experienced respectively a coup *d'etat* and a civil war. Many so-called democracies are still more procedural than actual, with the voice of the people far from being heard by so called democratically elected governments. Press freedom is certainly a long way from being the norm in much of Sub-Saharan Africa (Reporters without Borders, 2004). In simple terms, democracy in Sub-Saharan Africa is still very fragile and far from being institutionalized, even in those countries listed as democratic.

Today, Zimbabwe would be considered having regressed to an authoritative regime (AR).

11.6.1 Pre-Colonial Rule in Sub-Saharan Africa

Briefly, Leistner (2004) argues that traditional African society was highly democratic. Very often chiefs would be deposed or killed if too autocratic or if they failed to meet the expectations of their people. Zulu kings could not make laws without the consent of their councilors (*indunas*). Similarly, in many Bantu cultures, the local chief could not make key decisions without agreement by elders/headmen. Western style winner-take all voting, in which the majority can impose itself on a minority, is foreign to Sub-Saharan Africa. Kofi Annan,

Secretary General of the United Nations at a 2002 conference in Durban, stated (Gilliomee, 2003 *In: Leistner, 2004*):

“In Africa rulers listened to the ruled and the majority to the minority. Our traditions teach us to respect each other, to share power, to give every man his say and every woman hers. Consent and consensus, achieved through long and patient discussions, are at the heart of these traditions”.

“Authoritarianism and despotism cannot be justified on the basis of African tradition”, Dr. Busia former Ghanaian President (Ayittey, 1989 *In: Leistner, 2004*).

Unfortunately, many of the elites emerging out of colonialism did not emanate from the traditional ruling class, lacking a sense of responsibility that had been the hallmark of traditional rulers (see Chapter 3, Section 3.1, COLONIAL STATE IN AFRICA and Chapter 11, Section 11.4, ECONOMIC DEVELOPMENT AT INDEPENDENCE).

11.6.2 One Man, One Vote Multi-Party Elections, the Cure-All – Transition from Colonialism to Independence

One thing underlying all the difficulties caused by the interactions of Sub-Saharan Africa’s history over the past 40 years is weakness of governance and the absence of an effective state.

“By governance we mean the inability of government and the public services to create the right economic, social and legal framework which will encourage economic growth³⁴⁸ and allow poor people to participate in it” (Commission for Africa, 2005).

Independent Sub-Saharan Africa inherited autocratic rule and structures from colonial administrations, assuming power in the absence of firmly rooted

³⁴⁸ Economic growth is the annual percentage rate change (from year to year) in a nation's “real” (adjusted to remove the effects of inflation) gross domestic product (real GDP)

democratic institutions and processes (Martin & O'Meara, 1995; Leistner, 2004). Multi-party one man, one vote elections tended towards one-party systems preferred by the ruling elite. One-party systems were closer to African tradition and brought more stability than multi-parties that resulted in ethnic divisions. Autocratic rule by one man or a small clique was a travesty of traditional African political decision-making, but was erroneously accepted by the West as being part of Sub-Saharan African tradition. Leaders such as Julius Nyerere (Tanzania) and Kaunda (Zambia) deluded themselves that their one-party states were democratic as they slowly returned to the autocratic legacy of colonialism. Instead of relying on the metropole for support, they turned to their ethnic group (Ayittey, 1989 *In:* Leistner, 2004). Musah (2000 *In:* Musah & Fayemi, 2000) argues that

“the one-party system actually midwifed the present confrontations, firstly denying space for healthy competition between ideas and among personalities and secondly, by destroying the nascent structures of checks and balances within the body politic”.

Often, to maintain their power base, they co-opted the armed forces into the elite (Leistner, 2004). Thus, the beginning of patronage politics, discussed in Section 11.6.3, Neo-Patrimonial Clientelism, The Big Man and “Cosmetic Democracy”.

In most cases the West has tended to take a cookie cutter approach to democracy in Africa; “one man one vote multi-party elections”. Parties have tended to become tribally and/or religiously divided as opposed to ideological, and democracy has tended to be “one man one vote one time”, the leader or “Big Man” either being run out by a coup *d'etat* or dragged out with his heels in the air. Low economic development and little experience with Western-style governance resulted in the collapse of artificially installed democratic models, almost everywhere in the first decade of independence, by military coups and/or incumbents establishing one-party or one-man rule. In the worst case, as in

Rwanda/Burundi, “one man one vote multi-party elections” can result in mass genocide that pits one patrimonial group against another (see Chapter 13, Section 13.8.6, Former Cold War allies vying for power in the Great Lakes Region).

Out of a list of 50 African countries in 1989, almost all were one-party states or military dictatorships (Meredith, 2004). By the 1990s, heads of state in Africa had a 60% chance of losing power through assassination, exile or imprisonment (Reno, 2001 *In:* Friedl, 2001 *In:* Leistner, 2004). By the early 1990s, more than half the African states underwent transitions from military or one-party regimes to civilian rule. Much of this was a formality that allowed political parties with little change under the surface. By the mid-1990s, military coups in Burundi, Sierra Leone, Niger, Congo Brazzaville, Gambia (Cliffe, 2002 *In:* Zack-Williams, *et al.*, 2002) and more recently the Democratic Republic of Congo, reversed these trends. By 2000, military leaders had replaced civilian governments in more than half the African states (Reno, 2001 *In:* Friedl, 2001 *In:* Leistner, 2004), often under the guise of democracy.

Where multi-partyism exists, there tends to be a dominant party and thus little balance of power or accountability. Thus, existing elites continue (Cliffe, 2002 *In:* Zack-Williams, *et al.*, 2002), often in tandem with Western Governments and multi-nationals, to implement policies that benefit a minority of the population. Sub-Saharan African leaders have become adept at accommodating the international norm for competitive elections, while at the same time learning to manipulate them to their own ends (Bratton, 1999 *In:* Cliffe, 2002 *In:* Zack-Williams, *et al.*, 2002), with the Zimbabwe parliamentary election of 2000 and presidential election of 2002 being good examples. Rural peasants are incorporated into mainstream politics to a very limited extent and are often excluded from the definition of “civil society” (Cliffe, 2002 *In:* Zack-Williams, *et al.*, 2002). By 2004, every Sub-Saharan African nation had held elections, except

for the Democratic Republic of Congo (DRC/former Zaire), though the degree of fairness of polls across the continent has varied widely (Shiner, 2004).

In many cases “democracy in Africa” has been a façade for the establishment of Western controlled puppet governments, as former allies of the Cold War, especially France and the United States, battle each other for control of the continent’s vast natural resources (see Chapter 13, Section 13.8.2, American Imperialism in Sub-Saharan Africa, a Struggle for Control of Francophone Africa). “Democracy” has become a buzz word, the flavor of the moment, with little or no substance. Foreign aid enriches an elite who go through the motions of the “democratic process”, using this very process to enrich themselves and their Western allies (see Chapter 13), while the majority continue to live in misery and poverty which is worsening under one of the fastest growing populations in the world (see Chapter 5, Table 5.12: Existing and projected populations in Africa and Sub-Saharan Africa). The wrong sort of aid helps leaders hold out, sanctioning some of the worst gangsters of the century, one-man kleptocracies and military dictatorships (Rosenblum & Williamson, 1987).

A classical example of patrimonial politics was Mobutu Sese Seko (born Joseph-Désiré Mobutu) of Zaire (today’s DRC). He first seized power in June 1960 from Congolese President Joseph Kasavubu and Prime Minister Patrice Lumumba, and stepped down in February 1961, only to seize power for the next 32 years in November 1965. He was supported by the United Nations, who themselves hired mercenaries, British trained Nepalese Gurkha soldiers to fight the Katanga mercenary forces helping the province secede. He would later be supported by French, Belgian and the U.S. military while it served their purposes to use Zaire for a Cold War staging grounds into Angola. He established a one-party state in 1966. His “Zaireanization” policy was less about Africanization than patrimonial rule, giving him and his ethnic group control over the means of accumulation that

should have gone to the state and its people. He had a patronage system of strongmen, many from his Ngbandi clan, and clients who personally controlled Zaire's multiple centers of accumulation (e.g., mining centers for diamonds, copper, cobalt, COLTAN (columbite-tantalite), gold, etc., as well as coffee, timber and oil) (Pech, 2000 *In: Musah & Fayemi, 2000*) (see Section 11.6.6.1, The Katanga story, an "African Solution" to democracy thwarted by the "Cold War" and beginning of French/American struggle over a quest for Africa's riches).

Shiner (2004) explains that "in a number of countries, whether it's Zimbabwe or Gabon or Cameroon or Togo or Guinea-Conakry, you have leaders who have been in power for well over 20 years who have outlived their usefulness but continue to cling to power and have become part of the problem rather than the solution to democratic governance" – the "one man one vote one time syndrome" as discussed above.

Americans are evangelical in the promotion of their system of governance on Sub-Saharan Africa and the rest of the world, including multi-party elections, a three-part governmental structure (legislature, executive and judiciary), active private media and lobbying non-governmental organizations (NGOs) as watchdogs. These superficial processes may or may not be compatible with Sub-Saharan African cultures and societies, but as importantly, they stay clear of the real issues such as social justice and economic dignity for all citizens. Thus, the pre-packaged U.S. model of governance being exported around the world takes on an artificial technical quality often resembling the theatre of the absurd (Sogge, 2002a).

Democratic process requires:

- Accountability.
- Human Rights Protection.
- Popular Control.
- Political Control.
- A Free Press

which provide power for scrutinizing executive conduct, legislation and public expenditure (Zack-Williams, 2002 *In: Zack-Williams, et al., 2002*). “Governments need to include civil society in ways that surmount the problems associated with Africa’s highly multi-ethnic states. Instruments of accountability need to be institutionalized” (World Bank, 2000).

“Aid-speak” is full of many plastic words such as good governance, human rights, anti-poverty, deregulation, de-bureaucratization, decentralization, multi-party democracy, civil society and anti-corruption (Sogge, 2002a). In many cases, these processes are absent and democracy becomes a façade. It is pure arrogance to think that America or Europe can take their system of governance and create the same system in other cultures. Real democracy comes out of “many subtle individual human battles” fought over decades and centuries that result in building traditions – the defense of democracy being the traditions of democracy.

“At present we are obliged to travel willy-nilly into the vain land of corporate hegemony with its self-serving notion that democracy is a nutrient to be injected into any country anywhere, a totally oppressive misconception of the delicate promise of democracy, which relies on the organic need to grow out of itself and learn from its own human errors” (Mailer, 2003).

From Sub-Saharan Africa's perspective, "The very idea that people can be forced to be democratic and/or free is quite startling. Freedom and liberation from autocratic rule, as well as democracy and accountability cannot be decreed. They must have a social basis in which they arise, are nurtured and sustained" (Barya, 1993 *In:* Sogge, 2002a). Democracy must fit within the socio-cultural framework of a given country and its history, not America's or Europe's. Unfortunately, in today's Africa, in many cases "Central Government" controls "Local Government" (e.g., Kenya) or at worst, as in Sierra Leone, Siaka Stevens abolished local government in 1972 (Zack-Williams, 2002 *In:* Zack-Williams, *et al.*, 2002).

Kofi Annan, a Ghanaian and Secretary General of the United Nations, in a speech given on March 25, 2004 to the UN Security Council, scolded West African leaders by pointing to the root causes of the regional instability as being linked to questions of governance, human rights and transparency. "Until they are addressed with real resolve, until there is a fundamental break with authoritarianism and the culture of violence, exclusion and impunity, I fear that whatever inroads we manage to make in handling cross-border problems will remain just that - temporary inroads, and fragile at best" (Heinlein, 2004). As will be seen throughout the next three chapters, African leaders are to blame for much of the problems on the continent, while their actions are often in complicity with Western governments and their multi-nationals.

"Recent analysis of the determinants of civil wars in Africa and other regions points to deep political and economic development failures as the root causes. In diverse societies where inter-group interactions have been uncooperative, the fundamental problem has been a failure to develop political institutions able to accommodate such diversity. The highly centralized governance systems in most African countries have failed to take into account sociopolitical differences" (World Bank, 2000).

This becomes explosive when mass poverty enters the picture, igniting ethnic, religious, and cultural diversity into hatred and conflict as these groups compete for survival, while often a small elite reap the majority of the benefits at the expense of the masses. The World Bank (2000) argues that faction-ridden (ethnically diverse) societies are best administered by a consensus-based decentralized inclusive democracy. However “a government has not decentralized unless the country contains autonomous elected sub-national governments capable of taking binding decisions in at least some policy areas” (World Bank, 1999 *In: Junge, 2004*). The World Bank (2000) believes that “good governance should aim to achieve the ‘three E’s’:

- Empower citizens to hold governments accountable through participation and decentralization.
- Enable governments to respond to new demands by building capacity.
- Enforce compliance with the rule of law and greater transparency”.

Sub-Saharan Africa “must develop democratic systems that facilitate political inclusion and representative parliaments, able to respond to the needs of a citizenry that defines itself largely in terms of ethnic kinship, including” (World Bank, 2000):

- “Informal power sharing among elites.
- Proportional representation that protects minorities.
- Bicameral legislatures in which one (upper) chamber represents diverse regional or ethnic groups, giving them equal power regardless of their numerical or economic strength.
- Regional autonomy, with compensation mechanisms for less advantaged regions.
- Federalism with national-level guarantees of individual rights so that discrimination against minorities in specific states can be assuaged by higher intervention.
- Confederacy, providing constituent groups with wide powers short of national defense and foreign policy” (World Bank, 2000).

It sounds good on paper, but it is Sub-Saharan Africa and Africans who must determine how to develop such concepts that fit into their cultures and societies. Interestingly enough, an evaluation of foreign aid and development by the U.S. Congress found that democracy on its own is not a guarantee for economic development (Bhagwati, 1995 *In: CBO, 1997*):

- “Democracies with markets have had good economic performance and strong social indicators. Most Western countries are in this category.
- Democracies without markets have had poor economic performance and weak social indicators. India has been the classic example.
- Authoritarian governments without markets have failed in terms of economic growth and social indicators. The former socialist countries of the Soviet bloc are obvious illustrations.
- Authoritarian governments with markets have made rapid gains in prosperity. Examples include China, the fast-growing countries of East Asia, and Chile under General Pinochet”.

Similarly, Sachs (2005) believes that links between democracy and economic performance are weak, citing the emerging economic giant China with low freedom, and low economic growth in Switzerland and Uruguay where freedom is good. Thus, while economic growth may increase as indicated by GDP/GNP, even in countries with low levels of democracy, it is rare to find democracy in countries with declining per capita GDPs, typical of Sub-Saharan Africa (see Section 11.4, ECONOMIC DEVELOPMENT AT INDEPENDENCE and Chapter 13, Section 13.1, CURRENT STATE OF AFRICAN ECONOMIES). Other constraints to economic development, as discussed in this book, include ecology/climate, infrastructure and proximity to markets, culture, educational levels, health and fertility rates, land and resource tenure, geopolitics and trade (Sachs, 2005). Democracy, though it can facilitate growth, without markets will not be able to sustain economic growth (CBO, 1997) and in fact, could regress to

more repressive forms of government and even anarchy. On the other hand, economic development, as judged by this analysis, does not necessarily imply freedom of speech, open presses and transformation of society, which certainly occurs with greater difficulty under authoritarian governments.

11.6.3 Neo-Patrimonial Clientelism, the Big Man and “Cosmetic Democracy”

“Culture is how the past interacts with the future. Africa’s past is one in which, in pre-colonial times, people grouped themselves through clans. Their culture was strong on kinship ties and a sense that the members of the group were responsible for and to one another. Many of these features, such as the relationship between elders and non-elders, persist today. Not least here is the ‘big man’ culture which requires a successful member of the clan to offer patronage to other members – a phenomenon which is rarely taken with sufficient seriousness by development...What can appear to donors as a form of anarchy is in fact structured; it is just that these are structures which Westerners are not trained to perceive. Africans survive – and some prosper – in the face of low incomes and few jobs in the formal economy. They do so using a complex network of social relations that make decisions about who gets start-up capital for small enterprises or interest-free loans in emergencies. These networks may be informal but they reveal how African people will get involved in activities where they can see purpose and direction...such networks are seen as alternatives to the state. That is most obviously true in places like Somalia where the state has completely collapsed. But all across Africa there are ‘failed states’ in the sense that they are unable to provide the basic legal and economic frameworks, or public services like health and education, which citizens expect. There is a widespread cynicism with politicians. In the Wolof language (of West Africa, especially Senegal and Gambia) the word ‘politig’ has come to mean lying or deception. Voters have become disillusioned” (Commission for Africa, 2005).

Chabal and Daloz (1999) believe that the fundamental prerequisite for development of a modern “Western” state of institutional emancipation from

society is culturally incompatible with Africa. Chabal and Daloz (1999) argue that this is because the neo-patrimonial clientelism that exists in which wealth redistributed to the “Big Man’s” communal support base (his extended family, village, ethnic group, religious group, region, etc.) helps nourish the clientele who keep the “Big Man” in power. In ethnically diverse societies, public sectors are faced with continuous pressures to dispense patronage along ethnic lines (World Bank, 2000).

Ake (1976 *In:* Leistner, 2004) believed that while ethnic conflict always existed, this increased after independence due to growing poverty and misrule. In a stagnating or shrinking economy, the communalization of politics results in each ethnic group’s struggling, by cheating and fraud, to place its protégés in power in order to guarantee themselves a portion of the national cake (Young, 1997 *In:* Leistner, 2004). Alemayehu (2000) believes that the fall in real terms of salaries from inflation and devaluation adds to this problem, with salaries falling well below minimal financial needs. In the 1980s, when the principal author was in West Africa, the average Gambian state employee made US\$ 25 per month. Even today in 2005, the head of hunting for all of northern Tanzania, overseeing a multi-million dollar business, makes only about US\$ 75-100 per month (Mremi, *pers. comm.*). This is disgraceful and one must ask what happens to the wealth generated from wildlife. Anyone who can remain honest on such a salary should be an automatic candidate for sainthood. Under such circumstances, many leaders have also played the ethnic card as a tactic to divide and rule (Shiner, 2004).

Once patronage becomes a major instrument of politics, it permeates and subverts public life in which merit plays no role, but ethnic and clan affiliations do. Corrupt elites are easily turned into willing tools of harmful outside interests. Once the opposition is eliminated (e.g., chased out, killed or muted as under

Sekou Touré of Guinea-Conakry, Banda of Malawi, Moi of Kenya and Mugabe of Zimbabwe), human rights are abandoned, while freedom of speech and the press become controlled by the autocratic ruler (Leistner, 2004). Ake (1985 *In:* Leistner, 2004) believes that many post-independent Sub-Saharan African rulers mobilized their people with the idea of an egalitarian, if not socialist democracy, that they had to either make good on, or disenfranchise the people politically. They chose the latter, while trying to remain permanently in power through political repression – that is until another clan or ethnic group overthrew the current group in power. This helps account for the turbulence of the 1960s until today, mixed in with global politics as will be discussed in this chapter along with Chapters 12 and 13. Initially, these indigenous elites had the trust of their people until it was realized that they differed little from their foreign predecessors (Leistner, 2004).

11.6.3.1 Patronage politics, Zimbabwe's Department of National Parks and Wildlife Management (DNPWM)

The Department of National Parks and Wildlife Management (DNPWM) in colonial Southern Rhodesia was small, professional, technical, predominantly white and highly responsive to a narrow white settler constituency. Departmental staff was instrumental in introducing CAMPFIRE (see Chapter 9), game ranching, crocodile and ostrich farming, and elephant management. Quality ecological research laid the foundation for management decisions, though monitoring was negligible. After independence, the department became increasingly linked to a politicized central government in which meritocracy was replaced by patronage in the management staff, steadily reducing performance (Child, McKean, Kiss, Munthali, Jones, Mtsambiwa, Castley, Patton, Magome, Pangeti, Fearnhead, Johnson & Chilikusha, 2004a *In:* Child, B., 2004a).

Similar to Chabal and Daloz (1999), this case study (Duffy, 2000) argues that pre-colonial social systems, such as lineage and ethnicity, appropriated colonial institutions at independence. It also demonstrates the influence of Western donors and NGOs on the politics of sustainable use.

At independence in 1980, the DNPWM was largely made up of white technicians and managers. The department became divided into two factions (Duffy, 2000): 1) “Conservation faction”, made up of Willie Nduku,³⁴⁹ Rowan Martin³⁵⁰ and Gordon Putterill,³⁵¹ and 2) A “patronage alliance faction”, made up of Willas M. Makombe, a former school teacher with no experience in wildlife management, but closely allied to the ruling party ZANU-PF and the Permanent Secretary of the Ministry of Environment and Tourism, Tichafa Mundangepufupfu.

The “conservation faction” was heavily supported by western NGOs and donors, including the World Bank, USAID and GTZ. The “patronage alliance faction” used the issue of indigenization and black empowerment as a smokescreen to gain control over resources and power (Duffy, 2000).

A number of scandals broke out in the early 1990s, accusing the “conservation faction” (Nduku and Martin) of misusing their powers to sell and/or exchange black rhino (International Rhino Foundation) and elephant (translocation of 500 elephant during the drought from Gonarezhou to Pilanesberg Park, Bophuthatswana – now a provincial park in South Africa) for gifts and/or at below market prices – implying kickbacks, awarding non-competitive translocation contracts to ex-park employees (Clem Coetsee of Wildlife Management Services), stocking white game ranches and conservancies with park estate wildlife, and donor funding (GTZ, U.S. Fish and Wildlife Service

³⁴⁹ Director of Wildlife

³⁵⁰ Deputy Director of Wildlife

³⁵¹ Chief Warden of Gonarezhou National Park

(USFWS), USAID, NGO) bypassing central treasury (Duffy, 2000). Though some allocations seemed to have weight, the majority were never completely proven. The takeover was not entirely political, resorting to violence when deemed necessary. Both the Deputy Director of DNPWM, George Pangeti (*pers. comm.*) and the head of hunting quota setting, Don Heath (*pers. comm.*), had what they believed were orchestrated vehicular accidents with government armored personnel carriers, with messages being sent out that if they enjoyed their lives, they should consider leaving government, which they both did. One cannot forget the value of wildlife to an unscrupulous political elite if they control and use the distribution of its access as part of a clientele patronage power base, as described above by Chabal and Daloz (1999).

The net result was a takeover of the department by the “patronage alliance faction” and the misuse of estate wildlife by elite such as Vice President, Joshua Nkomo and his abuse of VIP (Very Important Persons) hunting privileges to allow investors in his hunting operation 30 free hunts in the Parks and Wildlife Estate, allegedly over-hunting the area using unethical practices (e.g., baits at waterholes, shooting from road and at night). There were also strong rumors of organized poaching rings within DNPWM, which could now operate more freely (Duffy, 2000).

This power struggle did much to discredit Zimbabwe among donors, who began channeling funding through NGOs, and at international forums such as the Convention on International Trade in Endangered Species (CITES) (Duffy, 2000), where under the conservation faction, Zimbabwe had been on the cutting edge of modern concepts such as community based natural resources management (CBNRM) and adaptive management through programs such as CAMPFIRE. The politics behind this case study are steeped in intrigue and rumor. What one can be sure of is that what appears to be a “white patronage faction” was ousted

by a “black patronage faction” in political control and power of what had become the second most valuable resource in Zimbabwe after mining; wildlife.

11.6.3.2 Corruption

The Commission for Africa (2005) found that

“Corruption is systemic in much of Africa today. It is another of Africa’s vicious circles: corruption has a corrosive effect on efforts to improve governance, yet improved governance is essential to reduce the scope for corruption in the first place. All this harms the poorest people in particular because it diverts funds away from providing the services they need more than anyone else in society and they are likely to have to pay a higher percentage of their income in bribes...The rot of corruption has spread throughout society at all levels”.

The German-based Transparency International Corruption Index (2006a) rated Sub-Saharan African countries among the most corrupt in the world (Table 11.2) based upon perceived abuse of public office for private gain from 12 different polls and surveys from nine independent institutions. A score of 5.0 is the number Transparency International considers the borderline figure, distinguishing countries that do and do not have a serious corruption problem (Infoplease, 2004).

Table 11.2 : 2006 Corruption Perception Index (CPI)

Country Rank	Country	2006 CPI Score (1)	Confidence range
1	Finland	9.6	9.4 - 9.7
11	United Kingdom	8.6	8.2 - 8.9
18	France	7.4	6.7 - 7.8
20	USA	7.3	6.6 - 7.8
37	Botswana	5.6	4.8 - 6.6
51	South Africa	4.6	4.1 - 5.1
55	Namibia	4.1	3.6 - 4.9
70	Egypt	3.3	3.0 - 3.7
70	Ghana	3.3	3.0 - 3.6
70	Senegal	3.3	2.8 - 3.7
79	Burkina Faso	3.2	2.8 - 3.6
79	Lesotho	3.2	2.9 - 3.6
84	Madagascar	3.1	2.3 - 3.7
84	Mauritania	3.1	2.1 - 3.7
90	Gabon	3	2.4 - 3.3
93	Eritrea	2.9	2.2 - 3.5
93	Tanzania	2.9	2.7 - 3.1
99	Mali	2.8	2.5 - 3.3
99	Mozambique	2.8	2.5 - 3.0
105	Malawi	2.7	2.5 - 3.0
105	Uganda	2.7	2.4 - 3.0
111	Zambia	2.6	2.1 - 3.0
121	Benin	2.5	2.1 - 2.9
121	Gambia	2.5	2.3 - 2.8
121	Rwanda	2.5	2.3 - 2.6
121	Swaziland	2.5	2.2 - 2.7
130	Burundi	2.4	2.2 - 2.6
130	Central African Republic	2.4	2.2 - 2.5
130	Ethiopia	2.4	2.2 - 2.6
130	Togo	2.4	1.9 - 2.6
130	Zimbabwe	2.4	2.0 - 2.8
138	Cameroon	2.3	2.1 - 2.5
138	Niger	2.3	2.1 - 2.6
142	Angola	2.2	1.9 - 2.4
142	Congo Brazzaville	2.2	2.2 - 2.3
142	Kenya	2.2	2.0 - 2.4
142	Nigeria	2.2	2.0 - 2.3
142	Sierra Leone	2.2	2.2 - 2.3
151	Côte d'Ivoire	2.1	2.0 - 2.2
151	Equatorial Guinea	2.1	1.7 - 2.2
156	Chad	2	1.8 - 2.3
156	DRC	2	1.8 - 2.2
156	Sudan	2	1.8 - 2.2
160	Guinea-Conakry	1.9	1.7 - 2.1

Source: Transparency International (2006). (1) CPI Score: 10 Highly Clean, 0 Highly Corrupt

However, what the West might consider as corruption becomes acceptable to those who keep the “Big Men” in power as long as this wealth is redistributed to the support base. Guest (2004) gives the example of ethnic solidarity being used to justify corruption, as Nigerian politicians scramble for petrodollars for themselves and their ethnic support base that keeps them in power. Likewise, the copper mines of Zambia were systematically looted in the 1990s under the Chiluba government as a source of patronage, worse than under Kenneth Kaunda (Guest, 2004). Nigeria and Zambia are just examples of what has been, and is still, common place all over the subcontinent.

Under the current administration of Kenyan President Mwai Kibaki’s anti-corruption campaign, four senior government officials signed a nearly 40-million-dollar deal to purchase passports and other equipment for the country's immigration office through a mysterious front company. The project fell through, and the four officials were suspended, but many believe Finance Minister David Mwiraria should be held accountable. Official corruption under the Kibaki government has cost Kenya almost 200-million-dollars in lost revenue (Ryu, 2004).

11.6.3.3 Corruption and the extended family

When the principal author was in West Africa, one had to be careful, and rightfully so, that secretaries and chauffeurs were treated with the greatest respect since, through the patronage system, they might be close relatives of the High Commissioner of the Gambia River Basin (OMVG) and other influential politicians. In reality, this is not much different than that described by July (1970) in Chapter one, in which the Sudanic kingdoms’ administrative and power base were build on relationships with clans, lineage and age groups; this system going back centuries.

In the late 1980s when the principal author was the environmental advisor to the OMVG,³⁵² he was called into the office of the technical director, Mamour Gaye (*pers. comm.*), an irrigation engineer where he was told, “I (Mamour) am one of the best paid professionals in West Africa, but I have no money. At the end of the month, my aunts, uncles, brothers, sisters, father, mother, cousins, nieces and nephews arrive and all of my salary is distributed. I have no bank account”. He went on to say, “remember this as you will be faced with it all your life if you continue to work in Africa; the basis of corruption in Africa is the extended family”. The principal author replied that this support network of the extended family was a good thing, something lost in the West where those who have, take care of those who have not within the family, so no one goes hungry. Mamour replied, “Yes this is true, but you are under so much pressure to provide for ‘the family’ it is wrong to steal, but well it is not that wrong if it is for the family”.

Thus, what we as Westerners consider illegal, may also be considered illegal in the African context, but be considered legitimate and not criminal by the extended family in the current setting of declining and/or stagnating economies on the subcontinent. It becomes a question of survival. Thus, in Sub-Saharan Africa, Chabal and Daloz (1999) call this “the moral economy of corruption” or “an economy of affection”. In Sub-Saharan Africa, there is “a marked reluctance to abide by the abstract and universalist norms of the legal-bureaucratic order that are the foundations of Western politics” (Chabal & Daloz, 1999). Communal codes of conduct become more important than individual codes of conduct, following the norms of pre-colonial Africa, such as obligations of mutual support, imperatives of reciprocity, gift exchange, payment of tribute, etc. (Chabal &

³⁵² Gambia River Basin Development Organization/*Organisation Pour la Mise en Valeur du Fleuve Gambie* (OMVG)

Daloz, 1999). This impacts both the business world and the world of good governance.

Another major constraint with the “culture of the extended family” that prevails in much of Africa is that it is a hindrance to entrepreneurialism in the modern world. While in the historical past of rural settings, it helped assure survival, in a global capitalist moneyed economy it becomes a form of welfare where one person supports large numbers, who then, as in all welfare systems across the world, lose their appetite to compete, being content to live from handouts. Foreign aid has taken advantage of this situation during the Cold War, developing global welfare from food aid to development aid. One problem is that currently, even if many young people living on this extended family welfare wanted to work, there are no jobs, so that they become caught up in an endless cycle of hopelessness and despair. These problems, from the cultural constraint of the extended family to job opportunities, must change if Sub-Saharan Africa is to have a future, of which there is no reason why it should not be one of the richest continents in the world.

The African form of governance thus becomes based on what Chabal and Deloz (1999) call “unequal reciprocity”, in which there is a trickle down to the bottom of the social order in exchange and recognition of the status and power of the provider. Thus, the patron-client relationship between the political elites and their clientele, to whom wealth is redistributed, results in a vertical form of accountability. If the elite abuse their wealth, meaning limited redistribution, they lose their support base and power to another “big man”/elite willing to be philanthropic to his/their constituency. Ostentation by the elite is not objectionable to the majority, as long as they benefit and its display (e.g., mansions, expensive cars and clothes) by the elite is a symbol of the collective “communal” prominence of vertical redistribution. The abuse of this system is

seen when “Big Men”, like Idi Amin of Uganda, Mobutu Sese Seko of Zaire and Moi of Kenya, stay in power at all costs. Once voters determine that politics is a struggle between ethnic groups, the winner grabbing and distributing the spoils, political parties become tribalized (Guest, 2004) instead of ideological.

Parliamentary democracy can work when individuals identify as citizens, as opposed to communal support networks along ethnic and/or religious lines necessary for survival under precarious economic and environmental conditions.

In Africa, individuals are not considered separate from communities. Chabal and Daloz (1999) do not consider “corruption”, as defined above, as necessarily incompatible with democratic systems and not necessarily detrimental to economic growth, giving Japan and the “Asian tigers” as examples. They believe, however, that a major difference is that money from “corruption” in Asia is reinvested back into production, while in Sub-Saharan Africa this wealth is used for instant gratification in the purchase of material goods, or results in overseas flight into foreign banks and thus, is of little value in stimulating Sub-Saharan African economies and long-term development. The continued dominance of commercial capital over industrial capital in Sub-Saharan Africa is a primary characteristic of under-development (Dumont, 1966). Visionaries, such as President Museveni, (see case study below) are experimenting in an “Africanization of Western Democracy” that blends traditional cultures and value systems with the concept of modern nation states and governance (see Section 11.6.6.2, Uganda, democracy, civil war and attempts to find an African solution). Ultimately, it must be accepted that there are well-recognized African norms of political practice, which do not conform to those found elsewhere.

Ultimately, to escape this endless cycle will likely require growing economies where the majority will have the opportunity to obtain gainful employment, decreasing the financial importance of kin networks in everyday survival.

Cultures change with economic times. Also, as societies become more literate and affluent, have better access to the media and global communications, governments will be held more accountable for their actions and corruption should be less of an issue (Sachs, 2005). Currently, corruption among African governments is no more or less than other countries at the same income level (Sachs, 2005).

11.6.4 Dangers of Economically Repressed Majority Being Handed Political Power through One Man One Vote Elections

As will be seen in discussions over Rwanda and Burundi (see Chapter 5, 5.9.4.6, Deforestation in afromontane forests, Rwanda, over-population and land degradation linked to deforestation for agriculture and political destabilization and Chapter 13, Section 13.8.6, Former Cold War Allies Vying for Power in the Great Lakes Region), Uganda (see Section 11.6.6.2, Uganda, democracy, civil war and attempts to find an African solution) and Zimbabwe (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife), Yale law professor, Amy Chua (2003), herself an ethnic Chinese minority from the Philippines, believes that the export of free-market democracy, that is one man, one vote elections and *laissez-faire* capitalism (basically structural adjustment (SAP) and “free-market” economic policies, which the West has never followed itself) in many developing countries where there is a “market-dominant minority” (e.g., Tutsi in Rwanda and Burundi, Bugandans in Uganda; whites in Zimbabwe, South Africa and Namibia; Lebanese in West Africa and Indians in East Africa), is a recipe for disaster. The impoverished majority takes control politically, resulting in a sudden and often violent rise in “ethno-nationalism” where, in the extremes, there may be outright genocide (e.g., Rwanda and Burundi) or attempts to take economic control, that if not carefully thought out, can be disastrous (e.g., when land reform becomes

politicized as in Zimbabwe). “‘Ethnic dominance’ - where the largest ethnic group is between 45 and 90% of the population - increases the risk of conflict by 50%” (Commission for Africa, 2005).

In such situations, creating an educated majority middleclass and not just an educated, but economically frustrated majority underclass, may be more important than a sudden change towards democracy in creating long-term peace and stability in Sub-Saharan Africa. This allows the majority to escape the shackles of the extended family, or at least the negative aspects thereof, as well as ethnic “Big Men” patronage systems. Leistner (2004) believes that modern communications (e.g., radio, television, the internet, film, etc.) combined with literacy is beginning to result in pressure from below by the impoverished majority for a better life that may no longer accept the status quo where a few live the good life at the expense of the majority.

11.6.5 Cultural Crisis and Democracy

Leistner (2004) sees the above as a profound cultural crisis for Sub-Saharan Africa. Africans, in their daily lives, have to contend with two fundamentally different cultures; one rooted in traditional African communalism, forcing successful family members to share and distribute their wealth among kin, to one rooted in Western individualism and the accumulation of materialism that today forms the basis of capitalism. Many are trapped between these two worlds and their implied obligations. Leistner (2004) sees Sub-Saharan Africa’s foremost problem as one of an inescapable need to come to terms with the conflicting demands of African traditions and the modern world. He believes that Afro-centrism that discredits Westernization is not the answer.

The authors believe that in the 21st century, the much espoused “African Renaissance” must be based on taking the best from both Western and African cultures and through integration, finding a middle road that allows the use of Western technologies and systems of governance that fit into African societies and cultures. This must link into their traditional knowledge and management systems in the case of wildlife and other natural resources. According to Leistner (2004), President Thabo Mbeki of South Africa is convinced that traditional worldviews and modern (Western) ways can be combined in promoting development. Ayittey (1990 *In:* Leistner, 2004) believes that African development must build on indigenous systems that have been assaulted by the elites after independence. Raum (1961 *In:* Leistner, 2004) believes Africans value modern technology and industry, but reject the egotism associated with the capitalist system. Like Japan, the Soviet Union and the Mediterranean countries, Sub-Saharan Africa must adopt industry and technology without losing its cultures and identities.

In closing, to many, Sub-Saharan Africa seems a hopeless subcontinent lost in continual turmoil. This might be expected after 100 years or more of colonial exploitation, followed by about 40 years of neo-imperialism and eco-imperialism continuing today. As President Yoweri Museveni explains, great democracies emerged from political turmoil and did not happen quickly or elegantly, or without staggering setbacks and agonizing contradictions. The American Revolution required eight years of fighting, five more years to get a Constitution ratified and another two years before elections were held – a total of 13 years after the Declaration of Independence was proclaimed (Gourevitch, 1998). In the West, development came with the revolutionary liquidation of feudalism. The autocrats will not willingly give up their arbitrary powers and unlimited privileges (Ake, 1976 *In:* Leistner, 2004). “Only when ordinary men and women have a cause to reject the logic of personalized politics, seriously to question the legitimacy of the

present political instrumentalisation of disorder and to struggle for new forms of accountability will meaningful change occur" (Chabal & Daloz, 1999 *In:* Leistner, 2004).

Let us hope that the new generation of 21st century Sub-Saharan African leaders, along with the enlightened youth, undoubtedly well aware through information technology (IT), will throw off the cloak of colonialism/neo-eco-imperialism and lead their people down a path that is best for Africa as opposed to benefiting a few elite, the West, and/or their multi-nationals. Only Sub-Saharan Africa can find its way to democracy best summed up by French Defense Minister Michele Alliot-Marie,

"We know that democracy can't be decreed and, for the graft to take, it has to take into account the historical and socio-cultural realities of the countries where it is being implanted" (Sands, 2004).

Leistner (2004) places much pressure on South Africa to show the way to the rest of Sub-Saharan Africa. Leistner believes that if South Africa fails to get it right, Sub-Saharan Africa will face anew the specter of colonialism only this time: 1) Pleading to be colonized and 2) No one will be in a hurry to colonize. The authors would agree with one caveat, democracy can't be imposed or "implanted" from the outside, but must come from within – from the people and their society – it must be something they want, not something we, the West, want for them.

11.6.6 Attempts at Finding African Solutions to Democracy

"If Africa is to move ahead, it must find a system of government that checks the whims and recklessness of its rulers and is responsive to the needs and aspirations of the people at large" (Leistner, 2004).

“...Africans are ordaining a hierarchy that maximizes foreign values and minimizes national values. Knowledge and experience are not shared across the generations. To change this presupposes a new generation of African leaders, ‘no longer willing to have the continent’s resources perennially pillaged and devalued, no longer willing to have the continent’s people, languages and cultures serve as cannon fodder in war between the imperialists’ ” (Ayi Kwei Armah³⁵³ writing in the *West Africa Magazine* In: Rosenblum & Williamson, 1987).

Chabal and Daloz (1999) consider multi-party democracy and Western norms a façade of the state to placate donor requirements necessary to receive foreign aid, what President Museveni of Uganda calls “cosmetic democracy” (Gourevitch, 1998). Museveni believes that there are certain commonalities such as universal suffrage, one person one vote by secret ballot, a free press and separation of powers (Gourevitch, 1998). Beyond this, Museveni believes that democracy must fit within the socio-cultural make-up of a society as opposed to the “new political religion” of multi-party elections as a cure-all for the world political ills, based on “ignorance” and “arrogance” (Gourevitch, 1998) of the West. Finding African solutions to democracy will be critical, as without a stable political environment that creates an enabling environment in which the private sector can function, the adoption of good land husbandry and sustainable conservation practices, along with economic development, cannot occur. The following are attempts to find African solutions to democracy.

³⁵³ Ghanaian novelist and poet born in 1939 whose writings deal with the problems of post-colonial Ghana.

11.6.6.1 The Katanga story, an “African solution” to democracy thwarted by the “Cold War” and beginning of French/American struggle over a quest for Africa’s riches

“ ‘Tomorrow or the day after, there will be a trial of strength. Let us prepare for it. Let Katangan fighters arise at the given moment in every street, every lane, every road and every village. I will give you the signal at the opportune time. You will not be able to have guns and automatic weapons but we will still have our poisoned arrows, our spears and our axes...We are here, resolved to fight and die if necessary. The United Nations may take our cities. There will remain our villages and the bush. All the tribal chiefs are alerted. We are savages; we are Negroes. So be it. We shall fight like savages with our arrows’ ” (Katangan President Moise Tshombe *In: Hempstone, 1962*).

“It is evident that the objective pursued by the UN troops is the complete destruction of the economic potential of Katanga, a policy aggravated by total disregard for human life” (*Union Miniere In: Hempstone, 1962*).

“Tshombe also directed a public appeal to ‘the free and civilized world to end this barbarous and useless carnage.’ In an obvious reference to the U.S., Tshombe charged that a ‘great power that itself prizes liberty’ was encouraging and financing the United Nations’ intervention in Katanga” (*Hempstone, 1962*).

“A political solution created by force would not survive the departure of the bayonets that imposed it...If the UN had existed 2 centuries ago, would it have been right for it to prevent the secession of the 13 American colonies from Britain or that of the South American nations from Spain and Portugal” (*Hempstone, 1962*)?

History of Katanga Province

The history of Katanga Province and Congo Belge, eventually Zaire, becoming the present-day Democratic Republic of Congo (DRC), stems back to the Cold War and the fear of a “Red Congo” controlled by the Russians. It also has to do

with the incredible riches (copper, diamonds, cobalt, germanium, manganese, zinc, cadmium, gold, silver, iron, tin, and coal) of the Katanga Province and early on, an attempt by the United States, using the United Nations as a proxy, to take control of this wealth. This sets the stage for the modern-day Anglo-Franco rivalry of the Post-Cold War for the riches of Sub-Saharan Africa (see Chapter 13, Section 13.8, FRANCE/US ANGLOPHONE COMPETITION FOR INFLUENCE AND RESOURCES IN AFRICA – NEW SCRAMBLE FOR AFRICA).

Smith Hempstone, former foreign correspondent for the Chicago Daily News and Washington Star, associate editor of the Star and editor-in-chief of the Washington Times, as well as U.S. Ambassador to Kenya in the early 1990s (Hempstone, 1997), provides an excellent overview of this tragic history in *Rebels, Mercenaries and Dividends, The Katanga Story* (Hempstone, 1962).

The battle for Katanga's riches began in the mid-1800s with the rise of the Bayeke kingdom under M'Siri, who monopolized traffic in slaves, ivory and copper, salt and iron to purchase arms and ammunition, enabling him to defeat even more tribes and expand his territory. He was a competitor for power over the Lunda and Baluba kingdoms, maintaining good relations with the Lunda and defeating the Baluba. His capital, Bunkeya, became the greatest trading center in Central Africa with a population of 20,000 and a harem of 600 wives by which he sealed allegiances through marriage. The Belge under King Leopold II, to whom the Congo Free State personally belonged – not to Belgium, and the British through Cecil Rhodes, vied for control over this area and its natural resources. After a shootout in 1891, in which the aging M'Siri was killed, the Belge negotiated with his eldest son and successor to fly the flag of the Congo Free State (Hempstone, 1962).

Congo Belge (the modern Democratic Republic of Congo) was Belgium's creation, with neither ethnic nor geographical meaning, carved out of Africa's heart in the late 1800s. The Belgians provided the link that provided a semblance of unity to this vast territory. The unity of the Congo was never more than a political fiction based on the façade of a common Belgian colonial administration, effectively concealing the fact that Congo Belge was not one, but several contiguous territories (Hempstone, 1962). This appears to remain the case at the beginning of the 21st century.

Eventually, the wealth of the Katanga was to be shared by the Belge and British, primarily through the Union Minière (mining company) and the British owned Benguela Railway, running from the headquarters in Elizabethville (current Lubumbashi) to the Angolan Coast. The Union Minière, and thus Katanga province, accounted for 20% of Congo Belge's Gross National Product (GNP) and 45% of its revenues, half of which were returned to Katanga for its local budget. This resulted in Katanga contributing 25% to the budgets of the other five provinces. The province had world class schools and hospitals. It was an industrialized area in which housing for workers was free and had the highest wages in Africa. Food, seed and fertilizer for gardens were subsidized, along with free medical care, health and disability insurance, paid vacations and old age pensions (Hempstone, 1962). One could argue that to some degree, this could be a model for what one would hope for Sub-Saharan Africa in the 21st century under NEPAD and AGOA (see Chapter 13), though possibly with more racial equity between management and workers, since there existed a privileged white upper and middleclass. However, one will see that both whites and blacks fought side by side against the U.S. backed United Nations peace keeping forces to maintain this unique aberration.

Moise Tshombe, Joseph Kasavubu and Patrice Lumumba

The key player of this story is Moise Tshombe, a descendant of royalty from the Lunda tribe, whose father, an entrepreneur, was Congo's first self-made African franc millionaire. He founded Katanga's first political party, the Confederation des Associations du Katanga (CONAKAT), consisting of 17 tribes, but dominated by the Lunda. His second in command was Munongo, a Bayeke. Tshombe was a tribal nationalist, believing the tribe should form the center of the nationalist movement – but he was not a racist or ethnic as he accepted all tribes and whites into his vision for the future. He was pro-Western and opposed centrally controlled governments as preferred by his hated rival, Patrice Lumumba. He liked the American model of federal government and states. Tshombe wished a federation, confederation and/or as a last resort, succession due to the vast historical, linguistic, tribal, geographic, economic and political differences over this vast territory. He was willing to share 50% of the wealth from Congo Belge's richest province with the rest of the country. He was supported by the Union Katangaise (political party of white settlers) who feared centralized control under radical Africans from the north, and he had strong support from the majority of the Katanga Province's tribes. He was anything but a puppet to the Union Miniere and the whites (Hempstone, 1962).

Joseph Kasavubu was from the Bakongo tribe and, like Tshombe, believed in political foundation on the tribe. He spearheaded the nationalist thrust in the Congo starting with the 1959 riots of Bakongo in Leopoldville (modern Kinshasa). Both Kasavubu and Tshombe wished to preserve the fabric of traditional societies. Both were pro-Western and both wished for some level of autonomy for their homelands and reconstitution of their ancient empires (Hempstone, 1962).

The fly in the ointment was Patrice Lumumba of the Batetela tribe who were known as warriors and for their savagery in the Force Publique – formed in 1891 and responsible for the annihilation of nearly 10 million Congolais over 30 years in Belgium’s quest for wild rubber. He was believed to be pro-communist and favored a strong centralized government. Hempstone (1962) believed that the fear of a Russian takeover by the West, through Lumumba and some of his cohorts, was unfounded since the only place where there had been direct communist intervention was into territories contiguous with a communist-controlled land mass such as Korea, East Germany, Indochina, Hungry and Tibet. Congo Belge was a logistical nightmare. This was to be proven in 1965 by Marxist revolutionary Ché Guevara (2001) who left in disgust, claiming that there would never be a communist revolution in the Democratic Republic of Congo (Zaire/Congo Belge). Lumumba was a key player in the Movement National Congolais (MNC), which had some of the best minds in the country (e.g., Joseph Ileo and Cyrille Adoua) and unlike most other parties, which tended to be regional and tribal, had representation country-wide (Hempstone, 1962).

Independence of Congo Belge

The Belgian Government agreed to grant Congo independence on June 30, 1960. Meanwhile, there was an ideological struggle – Kasavubu and Tshombe fighting for a loose confederation, while the Belgian Government and Lumumba favored a strong central government. They managed to push through “*loi fondamentale*” that assured a strong centralized government (Hempstone, 1962).

Katanga Province, under Tshombe, and the Mining State Province, under Kalonji of the Baluba tribe, legally seceded before the “*loi fondamentale*” could be ratified (Hempstone, 1962).

Meanwhile, Belgium asked Lumumba to form a government, in which he failed by using bribery, bullying and tribal rivalries. Even though he was a federalist, Kasavubu was brought in and became President, while Lumumba was named Prime Minister. Though disappointed, Tshombe agreed to be a part of this coalition government (Hempstone, 1962).

Before the country was a day old, Lumumba insulted King Baudouin of Belgium, accusing the Belgian monarchy (and rightfully so) of contempt, insults, hangings and shootings under its colonial rule. By July 4th, 1960, troops from the Force Publique mutinied for higher wages. It was at this stage that an obscure former army sergeant turned journalist, Mobutu Sese Seko (born Joseph-Désiré Mobutu), was named chief-of-staff. Although disavowed by Lumumba, Tshombe called in Belgian troops to stop the rape and murder of Belgian citizens. The net result was a temporary reprieve, but a rupture with Belgium and a deterioration of the fragile coalition between Lumumba and Kasavubu, resulted in the Congo becoming a pawn on the African chess board of the Cold War (Hempstone, 1962).

Katangan Session

Two weeks later, on July 11, 1960, Tshombe's Katanga Province seceded declaring itself a free and independent nation. Four days later, the UN Security Council authorized international intervention in the Congo and called on Belgian troops to withdraw. Hempstone (1962) believed that intervention by the UN was illegal under the UN charter, as this was a case of intervention in internal affairs of a country. The United States was paying 33% of the UN's running costs and 50% of its Congo operations. The USA fully supported these illegal operations by the peace keeping forces or "Blue Hats" of the UN. Hempstone (1962) felt that the John F. Kennedy Administration was shortsighted and unethical in its

support of their interventions. Secession took place only because Tshombe and other federalists were unable to obtain a realistic constitution.

Their attempt to create a federalist system at a meeting of Congo Belge's political leaders in Antananarivo, Madagascar, was rejected by the UN and the U.S. because it did not fit their doctrinaire theories of political science, America's fears over communism (Hempstone, 1962) and possibly America's desire to control Katanga's vast natural resources. Federalism was a Congo solution to a Congo problem similar to Yoweri Museveni's Uganda of the 21st century, but that was not good enough for the United States.

Mobutu Sese Seko

Meanwhile, the 31 year old Chief of Staff of the Army, Mobutu Sese Seko, seized control of power. However, he proved weak, forcing the UN and the U.S. to consider returning Lumumba to power after he had been fired as prime Minister by Kasavubu. Placed under arrest by Mobutu, a plane with Lumumba and some of his aids was refused landing at Bakwanga, the capital of the Mining State, and was forced to land in Katanga, against the desires of Tshombe being fearful of the political ramifications. Hempstone (1962) believed that Lumumba, was arrested and eventually eliminated in Katanga because of fear by Kasavubu and Mobutu of his return to power, or mistakenly beaten to death and/or killed while trying to escape. Madsen (1999) believed the Central Intelligence Agency (CIA) of the United States, in collaboration with Mobutu Sese Seko's men was behind his elimination in Katanga in February 1961, fearing his ties to the Russians. There does not appear to be substantial evidence as to what, if any, role Tshombe played in Lumumba's death. Meredith (2004) indicates that while the CIA had planned to assassinate Lumumba, ultimately it was undertaken by a firing squad under a Belgium officer with complicity by Tshombe.

By March 1962, 75 tribal chiefs from all parts of Katanga published a *communiqué* “disapproving of the conduct of the United Nations toward the Katangan people” and alleging that the UN was in the Congo to help the United States appropriate for itself Katanga’s copper and South Kasai’s diamonds (Hempstone, 1962).

Eventually, Tshombe came into the fold, being placated by being offered the post of Premier of the Congo. However, the CIA believed that Tshombe was too close to the Belgian and French mining interests and *Monsieur Afrique*, Jacques Foccart, who controlled France’s African policy, even though he protected American mining interests in Katanga Province. In 1961, former President Herbert Hoover, former Vice President Richard M. Nixon and Senator Barry Goldwater from the USA had even established a pro-Tshombe American Committee for Aid to Katanga (Madsen, 1999).

Again, in 1965, the U.S. gave the green light to Mobutu Sese Seko to stage another coup, ousting the feuding Kasavubu and Tshombe. Tshombe went into exile in Madrid. The Katanga secession was over. The CIA still saw Tshombe as a threat and wanted him eliminated. Against warnings from the French, Tshombe flew to Algeria to meet with the Americans, where on he was arrested and incarcerated in Algiers until 1969, where he succumbed to a heart attack. Mobutu Sese Seko consolidated his powers and provided America a stage from which to launch its ideological wars on the continent against the Russians, especially in support of Savimbi’s National Union for the Total Independence of Angola /*União Nacional Para a Independência Total de Angola* (UNITA) in Angola. Mobutu Sese Seko developed close ties with American businessmen and politicians and became reportedly one of the richest men in the world from “western economic assistance”, skimming foreign aid money (Madsen, 1999). Between 1965 and 1988, U.S. aid to Zaire totaled US\$ 860 million. Mobutu Sese

Seko retained close relations with U.S. presidents from Kennedy through George Bush Sr. (Meredith, 2004).

America and France Vie for Control

The United States had supported Mobutu Sese Seko, while Foccart and de Gaulle had supported Tshombe and Kasavubu, resulting in the beginning of a rift between France and the United States over African policy (Madsen, 1999) that is still being fought out on the continent today. For over 30 years, Mobutu Sese Seko enriched himself off the country's riches and foreign aid, while America and the West closed their eyes as long as the "little fish remained obedient to the shark". Some say he pocketed as much as US\$ 4 billion and murdered opponents "under the benevolent gaze of Washington" (Rosenblum & Williamson, 1990). By 1986, the United States was providing Zaire with US\$ 70 million/year, some of which was channeled to Jonas Savimbi's UNITA guerrillas in Angola. President Ronald Reagan declared the visiting Mobutu Sese Seko "a voice of good sense and good will" (Rosenblum & Williamson, 1990).

"During the Cold War, the United States shipped \$US 1.5 billion in armaments to African military forces, including \$US 400 million in arms and training to the Mobutu regime in Zaire (now the DRC) and over \$US 250 million to Jonas Savimbi's UNITA forces in Angola" (Hartung & Montague, 2001).

Once the "sharks" had no more use for the "old man", they decided it was time to eliminate him. Thirty years later, he would have served his purpose, finding himself in a similar situation to that of Lumumba and Tshombe (Madsen, 1999), when in the late 1990s he had become dispensable to American foreign policy in the Great Lakes/Central African region. Ironically, in the late 1990s, it was France who supported Mobutu Sese Seko, while America favored and helped put the

Anglophone, Joseph Kabilo, in power (see Chapter 13, Section 13.10.3.1, U.S. government involvement in the Democratic Republic of Congo).

Unfortunately, today the Democratic Republic of Congo has become the site of “Africa’s First World War”, which has set Uganda, Burundi and Rwanda against the Democratic Republic of Congo, Zimbabwe, Angola and Namibia; with manipulation by Western multi-nationals and governments behind the scenes of who controls land and mineral wealth (see Chapter 13, Section 13.10.3, Congo-Kinshasa DRC, Africa’s world resource war). As usual, the wildlife and the people suffer to the benefit of a few; national and international elites.

11.6.6.2 Uganda, democracy, civil war and attempts to find an African solution

While Uganda’s role as a proxy to American hegemony in East and Central Africa is a major issue (see Chapter 13, Section 13.8.6, Former Cold War allies vying for power in the Great Lakes Region and Section 13.10.3, Congo-Kinshasa DRC, Africa’s world resource war), its innovative role at Africanizing democracy cannot be denied.

First Attempts at Multi-Partyism Result in Religious and Ethnic Civil War

Multi-party elections in Uganda resulted in a 15-year civil war and a 95% reduction in wildlife populations, with elephant populations virtually eliminated. The past history of Uganda was religiously and tribally divided parties (Museveni, 1997).

Colonialism and Exasperation of Ethnic/Religious Cleavages

Both “tribal/ethnic” and religious cleavages existed. In many cases colonialism helped to exasperate these cleavages, for instance by setting aside land for the exclusive use by war-like Karamojong pastoralists that was closed to other

groups. This had unintended side effects, such as marginalization and isolation of such groups from the development process, and is today increasing the difficulty of integrating these communities into a peaceful Ugandan environment (Kirk, 2000 *In: McCarthy, Swallow, Kirk & Hazell, 2000*).

Any resistance by the monarchy to manipulations in how their monarchies functioned as part of a “British assisted Indirect Rule”, resulted in kings being deported by the British (e.g., King Mwanga of Buganda and King Kabarega deported to the Seychelles in 1899 and Kabaka Mutesa II of the Bugandan kingdom, temporarily deported to England in 1953). In March 1962, the London Conference ratified a constitution recognizing five federated kingdoms in Uganda. Various parties were split along religious and ethnic lines. For instance, the Bugandan government was dominated by protestants linked to the *Kabaka* (title for the King of Buganda), eventually forming the Kabaka Yekka (KY) party or “The King Alone”. Catholics, who made up the majority of Buganda’s population, formed the Democratic Party (DP), which was eventually almost outlawed in Uganda. Meanwhile, Milton Obote’s (a Nilotc from the north) Uganda People’s Congress (UPC) had its power base outside of the Buganda Kingdom. The UPC had the support of Protestants and Bairu (Iru - same as Hutu in Rwanda/Burundi – farmers) in the Ankole Kingdom. In reaction, the Bahima (related to the Tutsi of Rwanda and Museveni’s ethnic group) of the Ankole Kingdom, and even Catholic Bairu, allied themselves with the DP, igniting both a religious and largely ethnic split. In the Bunyoro Kingdom, an anti-Buganda feeling existed, since at independence the Kingdom of Buganda refused to give back sacred sites and thus, territory claimed by the Kingdom of Bunyoro. Thus, the Uganda People’s Congress (UPC) dominated in Bunyoro. The Kabaka Yekka (KY) tended to dominate politics in Buganda and the UPC the remainder of the country. At independence in 1962, Milton Obote was declared Prime Minister (Chrétien, 2003).

It is believed that the counter-balance of religion and the openness of Uganda to the outside world helped it from going down the same socio-ethnic path as Rwanda and Burundi. Thus, Uganda obtained independence in an atmosphere more regionalist (kingdoms) than nationalist, but which allowed the northern Nilotic culture groups to take political power (Chrétien, 2003).

Obote and Idi Amin - “President for Life, Conqueror of the British Empire”

In 1964, the UPC won a majority. Obote took control of an army mainly made up of northern Nilotics. In 1966, he suspended the Constitution and declared himself President. In May 1967, he forced the *Kabaka* (king) of Buganda into permanent exile and abolished all monarchies. In 1971 Idi Amin Dada of the Kakwa Nilote ethnic group, self-proclaimed “His Excellency President for Life Field Marshal Al Hadji Dr. Idi Amin, VC, DSO, MC, King of Scotland, Lord of All the Beasts of the Earth and Fishes of the Sea and Conqueror of the British Empire in Africa in General and Uganda in Particular”, took over in a *coup d'etat* leading to 15 years of civil war, tortures, massacres and economic collapse with complicity by the West (Chrétien, 2003). Up to 400,000 people were believed to have perished under his rule. In 1971, he expelled all Asians (BBC, 2003) primarily of Indian origin who followed the construction of the railroad from Mombassa to Kampala. The Indians had controlled much of the local commerce (*dukas* – shops), imports and exports such as sugar cane, cotton, etc., displacing the ancient commercial network that had functioned for centuries (Chrétien, 2003).

Amin fell in 1979 with intervention by the Tanzanian military, helping to put Obote, a fellow socialist colleague of Tanzanian President Julius Nyerere, back into power. Amin was given asylum and a state pension by Saudi Arabia where he passed away in 2003. In July 1985, Obote was replaced by a military council run by two generals, the Tito Okello and Bazilio Olara-Okello, from the Nilotic Chili tribe. As many as 100,000 people were killed by this leadership. Some estimate the deaths between Amin and Obote to be as high as 750,000 (Rosenblum &

William, 1987; 1990). The regime was supported until its end by the World Bank and International Monetary Fund (IMF). Chrétien (2003) calls the IMF and World Bank the “New Diviners and Initiates” equivalent to the traditional religious leaders who anointed monarchs, only today the religion is the Dollar and Euro.

Yoweri Museveni and No-Party Democracy

The Nilotic dominated army fought a five year civil war with Yoweri Museveni, a University of Dar es Salaam graduate and visionary who was an Ankole (Hima lineage) from Uganda and an anti-imperialist who was dismissed as Minister of Defense by Obote. Museveni formed the National Resistance Movement (NRM) in 1981. He created a united front of Bugandans and people from western Uganda, all Bantu-speaking against the new pro-north dictatorship. The 300,000 Tutsi refugees, whom Obote used as a scapegoat and who allowed the confiscation of their livestock by Iru farmers, gladly joined in the fight to oust Obote. In turn, they were supported by Museveni as the Rwandan Patriotic Front (RPF) to put a regime in power in Rwanda with similar ideals (see Chapter 13, Section 13.8.6, Former Cold War allies vying for power in the Great Lakes).

Museveni took over in 1986. His “no-party democracy” was a result of his fear of religion and ethnicity entering into party politics and tearing the nation apart, as described above. He felt that until: 1) Corruption was brought under control, 2) Until a middleclass (implies educated people) with strong political and economic interests developed and 3) Until there was coherent national public debate, political parties risked devolving into tribal factions, or financial rackets of elites, which could lead once again to civil war (Gourevitch, 1998). René Dumont (1966) also warned of the dangers of “European” style democracy in Africa until it reached a high degree of economic development, implying development of an educated middleclass – similar to how democracy evolved in Europe. Like

Museveni, he believed that African countries needed to choose the most suitable political and economic institutions as opposed to copying present-day Europe.

Multi-party electoral competition may have serious unintended effects and may even prove to be deeply destabilizing (Gourevitch, 1998; Chabal & Daloz, 1999) as it may threaten existing patron-client relationships. However, opposition within the no-party state could compete against each other for political power. President Museveni of Uganda has tried to find an African solution to governance (Museveni, 1997). He restored the monarchies, allowing the exiled kings and/or their heirs to return to Uganda. He invited the Indian business community back into the country. As he recognized that development cannot come from above (Chabal & Daloz, 1999) or through centralized planning, he created a bottom-up government.

The Resistance Committee/Council (RC) system of government completely reverses the antiquated top-down decision-making process of bloated centralized bureaucracies that have lost touch with and failed to address the development problems of most African countries. It can be argued that this is a form of federalism. The bottom-up pyramid RC system empowers people beginning at a village (RC 1) level, RC 2 at the parish, RC 3 sub-county, RC 4 county and RC 5 district; each level electing the leaders of the next level (Museveni, 1997). Today they are called Local Councils (LC) with the same number of levels. This system of bottom-up government gives rural-based people more of a say over their destinies, as to how resources will be allocated, and as to how development will take place in a manner that is acceptable to the diverse cultural and ethnic make-up in the different regions of Uganda. The Decentralization Statute of 1993, reconfirmed in the 1995 constitution, gave RCs (LCs) supervisory power over civil servants (Museveni, 1997). Museveni told the people that government bureaucrats are here to serve you. You are not here to serve them. If they do not work with you or do their job, send them back to Kampala (see Section 11.11.3.3,

Rwenzori Mountaineering Service). This was the beginning of finding an “African Solution to an African Problem”. At the same time, he is moving towards the industrialization and modernization of his country, while pursuing universal education for all of Uganda’s citizens.

Political boundaries respect the traditional boundaries of the kingdoms. Ethnicity is fundamental to African identity and can be made compatible with present African modernity that can re-anchor Africa into its rightful history. Politics must be based on, rather than avoid, the ethnic dimensions of the present nation-state, creating a political structure that is both legitimate in the eyes of the population and accountable in its operation (Chabal & Daloz, 1999). Chabal and Daloz (1999) call the modernization process that Uganda is undergoing “re-Africanization” of Western concepts or customs according to local socio-cultural norms. Museveni has been able to combine state rigor with respect for differences (Chrétien, 2003). In 1996, in presidential elections, he defeated the Catholic backed Democratic Party (and some say mostly Bugandan) candidate who had allied himself with the Uganda People’s Congress (UPC). The press is very free as exemplified by the newspaper, the *New Vision*. He has established an excellent system of education and health care and an independent judiciary (Gourevitch, 1998). He is feared by regional leaders who base their control on ethnic hatred and repression. He is currently being pressured by Ugandans and international donors to open up his country to multi-party elections. One must ask, is Uganda or the rest of Sub-Saharan Africa ready for multi-party systems of governance?

The Man or The System?

On the other hand, Museveni has major problems along his borders with various secessionist movements: including (Human Rights Watch, 2004):

- **Lord's Resistance Army (LRA)**, which has been engaged in a long war in the Acholi north of Uganda (1986-present). The conflict has four main characteristics, 1) Struggle between government and LRA, 2) Between the predominantly Acholi LRA and the wider Acholi population, including indiscriminate killings and the abduction of children to become fighters, auxiliaries and sex slaves aimed at cowering the Acholi and discrediting the government, 3) Fuelled by animosity between Uganda and Sudan supporting rebellions in each other's territory and 4) Continues the North-South conflict that has marked Ugandan politics and society since independence with the southerners monopolizing power (ICG, 2004) (see Chapter 13, Section 13.10.3.2, U.S. military aid). In 2007/8, what appear to be never ending peace talks with Uganda are taking place in Juba, Sudan;
- The **Allied Democratic Forces (ADF)** in the west, a diverse coalition of fighters formed in 1995, Sudanese backed Ugandan Islamic fundamentalist and a virulent anti-Christian group based in the Rwenzori Mountains, with bases also in Eastern Congo;
- The **National Democratic Alliance (NDA)**, last heard from in 1995, but recently alleged to have renewed activities in 2002, based in the east of the country.
- The **Uganda National Rescue (Resistance) Front (UNRF) II** in the northwest, operating out of Sudanese bases and partly formed by former fighters in former President Idi Amin's army.
- The **West Nile Bank Front (WNBF)** headed by a former Idi Amin minister and based in the northwest since 1996.
- The Kizza Besigye campaigners and a loose coalition of opposition parties and persons, who together took the name of Reform Agenda, have been targeted by the Ugandan government and accused of starting another rebel group, the **People's Redemption Army (PRA)**, linked to Rwanda and the Democratic Republic of Congo. Besigye was arrested in November 2005, on his return to Uganda from exile, accused of treason.

Time will tell if Museveni is able to bring these diverse groups into the decision making process of his country or if he tries to solve these problems purely by force, and if his system of governance will allow for a smooth transition of the Presidency and/or will he end up exiting like so many other leaders in Africa. The International Crisis Group (ICG) (2004) accuses him of using military force to address the situation to date. Human Rights Watch (2004) claims that, as practiced, the one-party democracy “has significantly curtailed civil and political rights of those who are in political opposition to Museveni’s government”. In early 2004, Museveni was accused of reverting to the classical tactics of the “African Strong Man”. Politicians challenging the one-party state and the 18-year rule of Museveni, are often detained, severely beaten and threatened with death by the uncontrolled security apparatus, originally established to contend with armed rebel groups and crime waves. In 2001, the government established a system of covert “safe houses”—with no oversight by the Ugandan judiciary and no access given to Ugandan government human rights officials. These places of detention facilitate torture and other abuses by shielding abusers from scrutiny. Individuals have been held incommunicado in such places with no contact with family members or lawyers—sometimes for months, being denied medical care despite severe injuries. The constitutional requirement that criminal charges be brought within 48 hours of detention or the suspect is released, is rarely honored in these cases (Human Rights Watch, 2004).

The International Criminal Court (ICC) has agreed to launch a formal investigation into allegations of human rights abuses in Uganda. The information about war crimes was provided by Ugandan President Yoweri Museveni against the Lord’s Resistance Army (LRA). Although President Museveni’s complaints mentioned only the alleged crimes of the Lord’s Resistance Army, human rights groups demanded that the government side be investigated as well. The ICC has agreed to investigate both sides (Butty, 2004). Some say that the war with the

LRA will drag on for a number of reasons, 1) Little is known of the LRA, how it functions and how many rebels there are and 2) Adams Oloo, lecturer in the University of Nairobi's political science department, believes that the north is not a priority for Museveni since it is a difficult place to control and he has determined that the country can be lead without necessarily controlling the north (Majtenyi, 2005).

Concern also exists that Museveni is pushing to change the Constitution that allows him to run for a third term (Geyer, 2005). In July 2005, Museveni used Parliament to erase presidential term limits, the majority of lawmakers receiving US\$ 2,800 each to ensure the measure's passage. Museveni announced that he would run for re-election in February 2005 (Lambert, 2005).

If the above allegations are true, it may be the man and not the Africanized democratic system that has failed. At the end of July 2005, a national referendum was held and 93% of the voters backed reform to multi-party elections. Many people feel like this was a ploy to appease the people and donors since parliament, earlier in July, scrapped a constitutional amendment that limited a president to only two terms. Voter apathy was high, with only 47% of eligible voters turning out, as provisions in the constitution already allow for multi-partyism and this is perceived as part of a plan to become a president for life (Thibodeaux, 2005; Voice of America, 2005). Others say Museveni is under pressure from the Western donors to allow multi-parties, the donors footing a large part of his annual budget (see Section 11.6.7, Foreign Aid and Puppet Governments – “Donor Democracy”).

11.6.6.3 South Africa's democracy, a possible decentralized model adapted to Africa

Countries that have been successful in the transition to democracy have relied very strongly on leadership with a vision for the country committed to democratic governance. After spending 27 years in prison, Nelson Mandela was one of those visionaries (Shiner, 2004). In South Africa's system of governance, much of the power is controlled at the provincial level with provinces dominated by one to a few ethnic groups. Control over access to natural resources such as wildlife is administered at the provincial level. Health and education are centrally funded provincial responsibilities. The amount of income redistributed to the local level depends on the average income/household and the number of rural residents/province. Local authorities can set user charges, property taxes and certain business taxes, but provinces are under the strict oversight of central authorities. Provinces can go into partnership with the private sector and a capacity building fund has been created by central government to allow municipalities to hire expertise as in-house abilities are developed (World Bank, 2000). Some shortcomings are that the ruling party, the African National Congress (ANC) is so strong that there is no counterbalance party to hold it accountable. In places like Kenya, a counterbalance has occurred through political parties forming coalitions. In South Africa, this has occurred, but the opposition parties are too small and thus too weak, serving more as watch dogs than political rivals to date. In addition, at the provincial and national levels, votes are not for individuals, but a party who then appoints individuals. The danger is that appointees may have more allegiance to the party than their constituents at the local level. It is said that in Botswana, which has a House of Chiefs (traditional rulers), parliament is also elected through parties as opposed to individuals. This might be considered as a model with appropriate parts being adapted by the rest of Africa, most importantly because it appears to be working.

However, South Africa's newly emerging democracy has some major hurdles to overcome in early 2008:

- Addressing the arms scandal in a transparent fashion, also being investigated by France, Great Britain, Sweden and Germany,
- Maintaining the independency of the National Prosecuting Authority and their Scorpion unit, currently investigating ANC President Jacob Zuma in the arms scandal and former national police commissioner and head of Interpol, Jackie Selebi's links to organized crime,
- Overcoming shortages in electrical supplies(see Chapter 7, Section 7.4, PEOPLE AFFECTED BY DAMS),
- Overcoming the increasing gap between the thin veneer of rich "Black Diamonds" (new class of wealthy black South Africans) created by black empowerment/affirmative action, and the more than doubling of poverty, from 1.9 million to 4.2 million South Africans living on 1 US\$/day between 1996 and 2005 (BBC, 2007),
- One of the highest crime rates in the world as a result of this poverty, and a flood of low-skilled refugees/illegal aliens as a result of turmoil and a failure to develop in the rest of Sub-Saharan Africa (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife)
- No longer along racial but along socio-economic lines, overcoming inequality in education between rich urban and poor township/rural areas, with the result that South Africa tested last in the World in reading comprehension and math (see Chapter 11, Section 11.13.1, Education),
- At the same time maintaining the standards at the university level, and
- Making sure 'fast track" land reform does not become politicized to the point that it destroys South Africa's food sovereignty (see Chapter 5, Section 5.7.4.2, Land reform and South Africa).

11.6.7 Foreign Aid and Puppet Governments – "Donor Democracy"

"The main question would be the moral education of the small fish. They would be taught that the greatest and most beautiful thing is to sacrifice oneself, and that they must believe and trust in the sharks, who determine their future. The small fish would have to understand that their future would be guaranteed only if they learned obedience" (Bertolt Brecht *In: Sogge* (2002a).

As reflected in conservation policies of Chapters three to five, most post-colonial governments were a continuation of colonialism. Many post-independent leaders

were puppets of the Cold War who could not have survived without Western Foreign aid, which allowed(s) them to maintain their repressive regimes at the expense of the economy and their people to the benefit of a few political elites.

“On average, every dollar of per capita foreign aid improves an incumbent autocrat's chance of surviving in office another year by about 4%, even after accounting for a myriad of independent factors. Since the average autocracy gets about \$8 per capita in aid, foreign assistance may boost the survival prospects of poorly performing leaders by 30% or more” (Bandow, 2002).

In 1980, Official Development Assistance (ODA)/foreign aid constituted less than 4% of SSA's GDP, rising to 10% by 1989, nearly doubling from US\$ 7.6 billion to US\$ 15 billion (Meredith, 2004). The World Bank (1992 *In:* Adams & Hulme, 1998) indicates that foreign assistance as a percentage of host country GNP was:

Mozambique - 66%, Tanzania - 48%, Malawi - 26%, Mali - 19%, Uganda - 18%, Kenya - 11%, and Zambia - 14%

In 2004, illustrative examples of the percentage of national budgets dependent on Western donor handouts include:

- Burkina Faso, 56% (Omotoso, 2004).
- Ghana, 46% (Omotoso, 2004).
- Mozambique, 73% (Omotoso, 2004), 70 % (IUCN/SASUSG, 1997).
- Niger, 87% (Omotoso, 2004).
- Rwanda, 95% (Omotoso, 2004), 60% by 1998 (Gourevitch, 1998).
- Tanzania, 78% (Omotoso, 2004).
- Uganda, 58% (Omotoso, 2004), 52% (Geyer, 2005), 40% in 2005, previously greater than 50% (Lambert, 2005).
- Egypt, 60% from America alone (Omotoso, 2004).
- Senegal, 70% (Atakpu, 2003).
- Mali, 79.3% (Atakpu, 2003).
- Sierra Leone, 60% of recurrent budget and 90% of capital budget (Atakpu 2003).

Although not naming specific countries, Peterson (2003) indicates many of the countries of the Congo Basin have national budgets made up of 60% donor

funding. The above “foreign assistance” percentages are believed to consist of Official Development Finance (ODF) that is Official Development Assistance (ODA)/Foreign Aid³⁵⁴ plus lending by multilateral financial institutions (World Bank, IMF, African Development Bank/*Banque Africaine de Développement* (ADB/BAD) plus Other Official Flows (OOF) with too low a Grant Element to qualify as ODA [see Section 11.7.1.1, Overseas Development Assistance (ODA) versus Overseas Assistance (OA)]. In the 1990s, as defined by OECD³⁵⁵, foreign aid or Official Development Assistance (ODA) was still over 40% of all flows (ODA, other official and private) to all developing countries and close to 90% of those received by Sub-Saharan Africa (White & Feeny, 2003) (Table 11.3).

Table 11.3: Percentage of total net disbursement of official and private disbursement/investment to developing countries

	1971-80	1981-90	1991-2001
All Developing Countries			
• Official Development Assistance (ODA)	36.7	50.8	41.3
• Other Official Flows (OOF)	8.7	6.6	4.6
• Private Flows	50.7	38.2	50.1
• Grants from NGOs	3.9	4.4	4.0
• Total	100.0	100.0	100.0
Sub-Saharan African Countries			
• Official Development Assistance (ODA)	59.5	77.8	88.3
• Other Official Flows (OOF)	11.2	14.4	0.2
• Private Flows	29.3	7.9	11.5
• Grants from NGOs	na	na	na
• Total	100.0	100.0	100.0

Source: White & Feeny, 2003, OECD/DAC on-line database, with permission, Journal of Economic Development (JED).

³⁵⁴ See Section 11.7.1.1, Overseas Development Assistance (ODA) versus Overseas Assistance (OA). Note that OECD and UNDP have slightly different definitions, UNDP's definition of ODA being the same as OECD's definition of Official Development Finance (ODF).

³⁵⁵ “The original member countries of the OECD (as of September 30, 1961) are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became members subsequently through accession at the dates indicated hereafter: Japan (28th April 1964), Finland (28th January 1969), Australia (7th June 1971), New Zealand (29th May 1973), Mexico (18th May 1994), the Czech Republic (21st December 1995), Hungary (7th May 1996), Poland (22nd November 1996), Korea (12th December 1996) and the Slovak Republic (14th December 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention)” (OECD, 2004).

In 2002, ODA averaged 74% of total flows for Sub-Saharan Africa, though for many countries it makes up 80-90% of all investments (Table 11.4) (see Chapter 13, Section 13.13.5, Foreign Direct Investment in Sub-Saharan Africa). With the exception of industrialized South Africa and Mozambique, significant Foreign Direct Investment (FDI) appears to be in those countries with oil and mineral wealth. Significant investment in the resource rich countries does not necessarily mean a transformation of society and a reinvestment of this wealth into development. In fact, very often the history has been just the opposite (Chapter 13, THE CURRENT AND FUTURE ROLE OF THE PRIVATE SECTOR IN SUB-SAHARAN AFRICA RESOURCES WARS OR NEPAD?).

According to the Commission for Africa (2005) (see Chapter 13, Section, 13.13.5 Foreign Direct Investment in Sub-Saharan Africa),

“Nigeria, South Africa and Angola – dominate, accounting for 59% (42% in Table 11.4) of all FDI flows to Sub-Saharan Africa. Investment in the extractive industries often thrives on risky conditions and weak governance because companies can strike highly advantageous deals. For example, when the rebel leader Jonas Savimbi was killed, ending the civil war in Angola, the share price of companies with large Angolan diamond interests fell. These extractive industry companies were doing well out of war”.

The issue of resource wars will be described in great detail in Chapter 13.

**Table 11.4: Official 2002 development assistance (ODA = foreign aid)
as a percentage of all investment inflows to Sub-Saharan Africa**

COUNTRY	ODA ¹ US\$ Millions 2002	FDI ² US\$ Millions 2002	Other Private Flows ¹ US\$ Millions 2002	TOTAL PRIVATE INFLOWS US\$ Millions, 2002	TOTAL ALL FLOWS US\$ Millions 2002	ODA AS PERCENT OF ALL FLOWS
HIGH HUMAN DEVELOPMENT						
Seychelles	7.9	63	-2.1	60.5	68.4	12
MEDIUM HUMAN DEVELOPMENT						
Cape Verte	92.2	14	1.2	15.12	107.32	86
Equatorial Guinea	20.2	123	0.0	123	143.2	14
South Africa	656.8	754	(.)	754	1,410.8	47
Gabon	71.9	123	15	138	209.9	34
Sao Tome & Principe	26.0	2	0.0	2	28	93
Namibia	135.1	181	-	181	316.1	43
Botswana	37.6	37	(.)	37	74.6	50
Ghana	652.8	50	-24.8	25.2	678	96
Comoros	32.5	1	0	1	33.5	97
Swaziland	24.7	107	0	107	131.7	19
Sudan	350.9	681	0	681	1,031.9	34
Cameroon	631.9	86	-45.5	40.5	672.4	94
LOW HUMAN DEVELOPMENT						
Togo	51.0	75	0	75	126	41
Congo	419.8	247	0	247	666.8	63
Lesotho	76.4	24	-7.7	16.3	92.7	82
Uganda	637.9	275	(.)	275	912.9	70
Zimbabwe	200.6	26	-33.2	-10.2	190.2	105
Kenya	393.1	50	-12.3	37.7	430.8	91
Madagascar	372.6	2	0	2	374.6	99.5
Nigeria	313.8	1,281	-652.5	628.5	942.3	33
Mauritania	355.4	12	4	16	371.4	96
Djibouti	77.8	4	0.0	4	81.8	95
Gambia	60.5	43	-0.04	42.96	103.46	42
Eritrea	230.4	21	0.0	21	251.4	92
Senegal	448.8	93	(.)	93	541.8	83
Rwanda	356.1	3	0.0	3	359.1	99
Guinea-Conakry	249.6	30	(.)	30	279.6	89
Benin	220.3	41	0.0	41	261.3	84
Tanzania	1,232.8	240	-28.2	211.8	1,444.6	85
Ivory Coast	1068.8	223	-117	106	1,174.8	91
Zambia	640.6	197	-11.1	185.9	826.5	76
Malawi	377.1	-	0.0	-	377.1	100

Table 11.4 (Cont.): Official 2002 development assistance (ODA = foreign aid) as a percentage of all investment inflows to Sub-Saharan Africa

COUNTRY	ODA ¹ US\$ Millions 2002	FDI ² US\$ Millions 2002	Other Private Flows ¹ US\$ Millions 2002	TOTAL PRIVATE INFLOWS US\$ Millions, 2002	TOTAL ALL FLOWS US\$ Millions 2002	ODA AS PERCENT OF ALL FLOWS
LOW HUMAN DEVELOPMENT (Cont.)						
Angola	421.4	1,312	1.0	1,313	1,734.4	24
Chad	233.0	901	(.)	901	1,134	21
Democratic Republic of Congo	806.7	32	0.0	32	838.7	96
Central African Republic	59.8	4	0.0	4	63.8	98
Ethiopia	1,306.7	75	-6.1	68.9	1375.6	95
Mozambique	2,057.6	406	-25.2	380.8	2,438.4	84
Guinea- Bissau	59.4	1	0.0	1	60.4	98
Burundi	172.1	-	-4.9	-4.9	167.2	103
Mali	472.1	102	0.0	102	574.1	82
Burkina Faso	472.7	8	0.0	8	480.7	98
Niger	298.5	8	-8.8	-0.8	297.6	100
Sierra Leone	353.4	5	0.0	5	358.4	99
Somalia	-	-	-	-	-	-
Liberia	-	-	66	-	-	-
Average % ODA/Total Flow	-	-	-	-	-	74
TOTAL	17,237.3	7,963				

1) ODA From UNDP, with permission from UN & UNDP 2004, 2) From UNCTAD, 2003 with permission from UN. See UNDP Definition of ODA in Section 11.7.1.1 Overseas Development Assistance (ODA) versus Overseas Assistance (OA). Differs from OECD definition.

Table prepared by principal author

The dominance of foreign aid/ODA in the injection of investment in Sub-Saharan Africa has created “Donor Democracy” that has two main features (Omotoso, 2004):

- 1) Empowerment of the state through creation of an oligarchy (elite), and
- 2) Disempowerment of the citizens.

Since the state does not need to collect taxes from its citizens, living off donor handouts and natural resources, the citizens have no real way of holding their government accountable, while the oligarchy's allegiance and accountability is to fulfill the desires of its donors and expatriate private sector partners as opposed to doing what is best for its citizens (Omotoso, 2004). The World Bank (2000) argues that this donor dependency in Sub-Saharan Africa results in many countries development policies "seen as being the prerogative of donors rather than governments". Booker and Minter (2001) argue,

"We maintain that there are integral interrelationships between the global context and the lack of accountability of governments to their peoples. The system works differently from the periods of colonialism or Cold War patronage, but the common element is that the structure builds in rewards for elites that respond to external pressures more than to the demands of their own people".

In essence, foreign aid creates a dependency relationship between Sub-Saharan African governments controlled by an elite and the West. Is it any wonder that economies are so easily manipulated with nonsensical structural adjustment policies (SAPs) imposed on Sub-Saharan Africa by the World Bank/IMF and other financial arms of the West that have been used to manipulate and control Sub-Saharan African economies as a means of accessing cheap raw products (see Chapter 12, Section 12.3.1, IMF and The World Bank)? As long as the oligarchy kowtows to the West, aid money keeps flowing, a portion of which is skimmed by the bureaucratic elite to help them maintain their lifestyles – corruption being ignored by the donors, while the majority of the people suffer in silence. Chabal and Daloz (1999) believe that structural adjustment (SAP) saved the patrimonial African state from complete economic ruin by assuring the flow of foreign aid (see Section 11.7, FOREIGN ASSISTANCE IN GENERAL and Chapter 12, Section 12.3.4.3, Structural adjustment and creation of government bourgeoisie). This puts off Sub-Saharan African governments developing viable

economies that serve their citizens, resulting in parallel underground “*survival*” economies, while the vast majority of the subcontinent’s riches are expropriated by the West in collusion with the oligarchy. Little or nothing from Sub-Saharan Africa’s riches are reinvested in the people (health and education) or infrastructure (industry, road networks), while 70-90% of the donors foreign aid money goes right back to where it came from through Western NGOs, consulting firms and their “*experts*”, while Africa drowns in the misery of its wealth (see Section 11.7.1, Foreign Aid as Portion of Donor Country GNP).

By the time many of these countries (e.g., Angola, The Democratic Republic of Congo, Zimbabwe, Liberia, Sierra Leon, etc.) are ready to collapse, it is usually “too little too late” for the West to begin complaining of mismanagement and atrocities, most of which have/were going on for the 20-30 years, but ignored as long as they allied themselves to the West. This has to be explained within the framework of the Cold War, where Sub-Saharan Africa and its emerging countries were staging grounds for the largest game of chess ever played, where Western and Eastern ideologies vied to take over the World; Free-market Economics and Freedom of Speech – Democracy versus Government Controlled Centralized Economies and Repression – Communism.

It has been in the interest of both the West and these despots to keep the masses ignorant; since the odds were that an educated majority would not let these groups take advantage of them, keeping them in extreme levels of poverty on a wealthy continent.

In hind site, it is easy to criticize the West for its shortsighted approach to Sub-Saharan Africa. However, at the time, possible nuclear war and the end of modern civilization precluded long-term visions and approaches to development in Sub-Saharan Africa. However, this does not justify the continuation of these

policies in the post-Cold War era as a means of exploiting Sub-Saharan Africa's incredible resource wealth at the expense of the masses.

11.7 FOREIGN ASSISTANCE IN GENERAL

“Unless development helps the poor and most destitute, it will only increase misery” (Rosenblum & Williamson, 1990).

“Even if it were possible to get enough money for our needs from external sources, is that what we really want?...Gifts which increase, or act as a catalyst to, our own efforts are valuable. But gifts which could have the effect of weakening or distorting our own efforts should not be accepted until we have asked ourselves a number of questions” (Excerpts from Tanzania’s *Arusha Declaration* cautioning about foreign aid In: Sogge, 2002a).

“Many development schemes have been fraught with disaster from the outset...badly conceived, but mostly because the experts supervising the projects have not had adequate background data on the people whose lives they are attempting to influence...the acceptance of aid may be contingent on using the donor country’s nationals as consultants. In addition, aid is too often seen by administrators in the recipient country as a means of financing their bureaucracy with only a small part of the budget going into the field, in the process showing little real concern for the needs that precipitated the donation in the first place. Moreover cultural prejudices and/or political factionalism within the recipient country may result in funds being channeled away from where they are most needed. Perhaps even more damning are attempts to produce results within the budget period so funding can continue” (Smith, 1992).

Success stories are fabricated while the target audience (e.g., farmers and pastoralists) are rarely consulted on the structuring and goals of the project (Smith, 1992).

Aid is a major policy tool used by governments to gain influence.

“The aid resources of bilateral donors, including the United States, tend to follow the donor’s political and strategic priorities, not those of the countries that have the greatest need from a development perspective” (CBO, 1997).

At best it is used to ensure the survival of the victims of famine or civil war (humanitarian aid). At worst, it is used to ensure the survival of unpopular and corrupt governments. However, it is always about survival, never development. Development implies change and self-reliance, whereas aid is habitually directed toward the status quo, usually coming with strings attached (Elwood, 1984). Loans made to African dictators were political bribes for aligning with the West during the Cold War, with little trickling down to the poor (Elwood, 1984; Weinstein, 2002). Foreign assistance became defined by a view of the world as divided into two opposing ideological camps. Bilateral aid favored former colonies and political allies more than open economies or democracies (World Bank, 1998a). The favoring of geopolitical aims over poverty reduction (House of Commons, 2002), often meant arming and propping up undemocratic and repressive governments such as in Zaire, Iran, the Philippines, El Salvador, Indonesia and many other countries, only because they were loyal U.S. allies (Lappé, Collins & Rosset, 1998; World Bank, 1998a) or Soviet aid to Uganda in the Amin era (Elwood, 1984). This was in conflict with the other key objective of foreign aid, the promotion of long-term growth and poverty reduction in developing countries with a major underlying motive of the Western donors being that in the long-term, their economic and political security would benefit if poor countries were growing. Foreign aid has not helped the developing world evolve and, in fact, has resulted in the world becoming a more dangerous place. If there was any altruism in aid, it has long ago disappeared.

Having given up their African heritage in favor of Western education and ideals, intellectuals at independence readily accepted development recipes of the IMF, World Bank and Western donors and their experts premised on the idea that

traditional African economies and social practices should be abandoned and the Western road to modernization closely followed. A few embraced the ideologies of the Soviet Union (Leistner, 2004). Foreign aid became an entrenched, endemic disease in Sub-Saharan Africa.

At best, under current “foreign aid policies”, poverty in Sub-Saharan Africa could be expected to decline only from 72% of the population in 1996 to 64% of the population in 2015, using the \$2 a day poverty line (Collier & Dollar, 2000 *In:* UN, 2001). At worst, with an ever-growing population and scarcer resources that will prevent most Africans from continuing to live traditional lifestyles, poverty could increase exponentially with population growth, maybe even exceed it as resource degradation accelerates.

Aid is supposed to help the poorest of the poor, but doesn't. As currently practiced,

“Foreign aid is a transfer of wealth from the poor in rich countries to the rich in poor countries...” (Guest, 2004).

The poor get poorer, being helped by aid only in times of famine and maybe today with the HIV/AIDS issue. Why is this so? Leistner (2004) argues that during the early years of African independence development assistance was based on the premise that substantial amounts of foreign capital would rapidly enable former colonies to catch up to the Western industrialized world.

Also, while centralized non-representative government has structural roots in colonial rule, it is exacerbated by fear that decentralization will lead to political dissolution and ethnic conflict and thus, support to the continuation of this system being supported by foreign aid to governments. This gave centrally created government agencies power to control and allocate critical resources, including

jobs. The state replaced the market place. In absence of accountable and transparent systems, foreign aid has helped perpetuate a system of political control, privilege and elite predation, patronage, security and corruption, as discussed above (Morris, 1995, Chabal & Daloz, 1999; CBO, 1997; Majewski, 2002; Peron, 2002; Sogge, 2002a; 2002b; Child, *et al.*, 2004a *In:* Child, B., 2004a; Leistner, 2004), in and of the formal economy including the conservation and wildlife sectors. As a result, the political elite have more allegiance to the aid-providing Western donors than to their own people, one of the ways that aid has helped destroy what fragile reciprocity that may have existed between African states and their citizens (Sogge, 2002a; 2002b; Leistner, 2004). Transparency International (2005a) contends that

“although aid can foster better governance, a huge influx of aid money can also prove counterproductive. As foreign aid comes to substitute for taxes, the local population loses a degree of leverage over local authorities, thereby undermining the so-called taxation representation of local authorities”.

Foreign aid tends to rob states and citizens of political power and self-determination resulting in (Sogge, 2002a):

- Fragile, hollow, corrupt, illegitimate institutions de-linked from their citizens.
- Decay or destruction of instruments to steer public policy and mobilize public revenue since the Western donors dictate policy and pay the bills.
- Political accountability upwards and outwards surrendering sovereignty to the Western donors.

Foreign aid can act like oil revenues, driving a wedge between the rulers and ruled (Sogge, 2002a), the donors/NGOs fulfilling government's traditional social obligations so that they may spend their money on more pressing matters.

“...in the developing countries, aid has perpetuated the rule of the incompetent and venal men whose leadership would otherwise be utterly non-viable; it has allowed governments characterized by historic ignorance, avarice, and irresponsibility to thrive; last but not least, it has condoned and in some cases facilitated the most consistent and grievous abuses of human rights that have occurred anywhere in the world since the dark ages. If government officials in the developed world were to stop using taxpayers' money to finance the oppressive activities of state officials in the developing world, if they were to close down the World Bank, the IMF, the United Nations and all the bilateral 'aid' organizations, and if they were to eliminate all barriers to trade, the poor in the developing world would most likely all be a great deal better off” (Morris, 1995).

Zimbabwe's President Robert Mugabe's use of food aid to buy votes in 2002 and 2003 is a prime example.

“Food aid subsidizes war. His (Mugabe's) attack on white farmers disguises that his real target is his black opposition. Now that Mr. Mugabe has destroyed the farms that fed the country and provided export earnings, famine looms. Food aid will enable Mr. Mugabe to nourish his supporters while starving the opposition. The compassionate Western donors will be complicit in an act of genocide” (Roberts, 2003).

These corrupt and tyrannical governments often diverted aid money to military projects used to finance policing techniques that made sure the ruling elite stayed in power and/or to Swiss bank accounts as “retirement” plans for African dictators, in case the policing failed (Peron, 2002). For example, nearly “\$US 2 billion per year over the past two decades has propped up an unpopular government (Egypt), its army and police and helped suppress democracy” (Frankel, 2004).

Economic development is undermined, since rather than developing their countries through stewarding and transforming their natural resources, the political elite live off donor handouts, while mining the continent's resources for short-term gains to their benefit and that of the collaborating Western multi-nationals (see Chapter 13). Meanwhile, as populations exploded in the 20th century, Sub-Saharan Africa failed to evolve out of Stage 1 Agriculture (see Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA). With the land no longer able to support traditional extensive systems of production, while development aid and other Western policies discouraged industrialization, Africans became trapped with one foot in the rural areas (in part-time subsistence agriculture) and one foot in the urban centers (usually slums working in low-skilled labor as "boys" and sending remittances to rural relatives). Neither environment was able to provide a better quality of life. The net result is that the majority of Sub-Saharan Africa's population has become poorer, increasingly malnourished and hopelessly marginalized, with little hope of escaping the downward spiral of poverty. This keeps Africans perpetually in a non-competitive status globally.

Examples of Third World governments using aid to enrich the ruling elite at the expense of the masses include: 1) President Mobutu Sese Seko of Zaire using foreign aid money to partly fund the construction of eleven presidential palaces, 2) Building expensive capital cities, such as Brasilia in Brazil, Islamabad in Pakistan, Abuja in Nigeria, Lilongwe in Malawi, Yamoussoukro in the Ivory Coast and Dodoma in Tanzania, that benefit the ruling classes in some of the poorest parts of Sub-Saharan Africa where government officials are known as "Wabenzi"- a Swahili word for "men of the Mercedes-Benz", and 3) Subsidizing Third World airlines that benefit the elite of the country, while taking away resources from needed private sector activities. Foreign aid has united the governments of the Third World into a cohesive unit that has but one goal: secure more aid. Foreign aid fails as a development policy because it destroys the

incentives of the marketplace, increasing Third World poverty. On the other hand, the alternative policy of free-trade will give the private sector of the LDCs (Least Developed Countries, Less Developed Countries) an opportunity to expand and flourish (Majewski, 2002), only if structured properly and based on transformation of raw products in Sub-Saharan Africa with equality in the openness and availability of markets.

As a result of foreign aid, Sub-Saharan Africa has become a continent of subsistence over the last four decades, to being relegated by the ruling class and imperialism, to a subcontinent whose people subsist on food aid (Zack-Williams, 2002 *In: Zack-Williams, et al., 2002*).

There is also a problem with donor funded projects tending to have a limited life span, resulting in “attempts at development” being undertaken in sporadic efforts without much of a long-term vision, rather like going on a roller coaster ride.

“Lele (1990 *In: Eicher & Staatz, 1990*) explains, “The swinging pendulum of donor’s concerns has tended to divert attention from basic long-run problems. Development strategies in the 1970s tended to concentrate on ‘quick’ poverty alleviations, which gave priority to helping low income regions and populations and to raising food crop production mainly to meet growing urban demand’. The results were mixed. “In the 1980s the emphasis switched to equally ‘quick’ solutions, based on the correction of price incentives and liberalization of markets designed to raise production, particularly for exports” and most recently in food security”.

Finally, most foreign aid “development” projects collapse once donor funding ends because they are not driven by entrepreneurship (e.g., private sector), but by consumptive governments/NGOs/consulting firms, and governments do not have the financial ability to continue subsidizing them (Eicher, 1990 *In: Eicher & Staatz, 1990*). Thus, today, donor-driven development in Sub-Saharan Africa, mostly run by NGOs, tends to run in 2-5 years cycles, after which everything

collapses and one wonders why Sub-Saharan Africa isn't developing. Maybe as President Museveni of Uganda once said,

“ ‘A little neglect would not be so bad. The more orphaned we are the better for Africa. We will have to rely on ourselves’ ” (Gourevitch, 1998).

“Trade is more important than aid. Aid is only important if it is together with trade. Otherwise, aid by itself is useless and even counterproductive”, President Yoweri Museveni of Uganda (2003a; 2003b; 2003c).

11.7.1 Foreign Aid as Portion of Donor Country GNP

11.7.1.1 Overseas Development Assistance (ODA) versus Overseas Assistance (OA)

Foreign assistance is bogged down in bureaucracy and a myriad of definitions that can be a bit confusing.

Overseas Development Assistance (ODA), most often referred to as “foreign aid” (World Bank, 1998), can be defined as “traditional” aid to developing countries on Part I (Developing Countries and Territories) of the Development Assistance Committee (DAC)³⁵⁶ of the Organization for Economic Cooperation and Development (OECD) List. This “official development assistance”, has a long-standing United Nations target of 0.7% of donors’ Gross National Product (GNP) (OECD, 2005). Part I countries are subdivided into (OECD, 2003):

³⁵⁶ Members of the Development Assistance Committee (DAC) of the OECD are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States and the Commission of the European Communities (DAC, 2004).

- Least Developed Countries (LDCs) that includes most of Sub-Saharan Africa, except those listed below.
- Low Income Countries (LICs) with per capita GNI (GNP) of less than US\$ 745 in 2001 that includes Cameroon, Congo Republic (Brazzaville), Ghana, Kenya, Nigeria and Zimbabwe.
- Lower Middle-Income Countries (LMICs) with per capita GNI of US\$ 746-2,975 in 2001 that includes Namibia, South Africa in Sub-Saharan Africa plus from the continent, Algeria, Egypt, Morocco, Swaziland and Tunisia.
- Upper Middle-Income Countries (UMICs) with a per capita GNI of US\$ 2,976-9,205 in 2001 that includes Botswana, Gabon and Mauritius.
- High-Income Countries (HICs) with per capita GNI greater than US\$ 9,206 in 2001.

By the OECD definition, ODA includes:

“Grants or Loans to countries and territories on Part I of the DAC List of Aid Recipients (developing countries) which are: (a) undertaken by the official sector (donor bodies representing OECD countries); (b) with promotion of economic development and welfare as the main objective; (c) at concessional financial terms [if a loan, having a Grant Element (q.v.) of at least 25%]. In addition to financial flows, Technical Co-operation (q.v.) is included in aid. Grants, Loans and credits for military purposes are excluded...Transfer payments to private individuals (e.g. pensions, reparations or insurance payouts) are in general not counted” (DAC, 2005).

In addition to grants, a portion of ODA has a loan component to it that contributes to the buildup of both bi-lateral and multi-lateral debt (see Chapter 12, Table 12.2, The HIPC: Debt and income decline). For instance, in 1997, 55% of Japanese aid was in the form of loans, while 15% of French, German and Italian aid was loans (Jubilee 2000, 2000).

Aid to the "more advanced" Eastern European and developing countries is included in Part II (Countries and Territories in Transition) of the List and is recorded separately as "Official Aid" (OA) (OECD, 2005). This includes (OECD, 2003):

- Central and Eastern European Countries and New Independent States of the former Soviet Union (CEECs/NIS). Some CEECs/NIS counties can be found in various categories in Part I of the List.
- More Advanced Developing Countries and Territories that includes Libya and Israel.

The list of countries falling into each category is reviewed every three years (OECD, 2005). ODA plus Other Official Flows (OOF)³⁵⁷ plus grants and concessional and non-concessional development lending by multilateral financial institutions (World Bank, IMF, African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) are totaled to provide Official Development Finance (ODF)³⁵⁸, as defined by OECD (DAC, 2005). This becomes even more confusing, as the UNDP (2004) definition of Net ODA appears to be OECD's definition of ODF,

“Disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies (donors) of the members of the Development Assistance Committee (DAC),

³⁵⁷Other Official Flows (OOF) = “Transactions by the official sector (OECD donors) with countries on the List of Aid Recipients which do not meet the conditions for eligibility as Official Development Assistance or Official Aid, either because they are not primarily aimed at development, or because they have a Grant Element of less than 25%” (DAC, 2005).

³⁵⁸Official Development Finance (ODF) = “Used in measuring the inflow of resources to recipient countries: includes (a) bilateral ODA, (b) grants and concessional and non concessional development lending by multilateral financial institutions (World Bank, IMF, African Development Bank/*Banque Africaine de Developpement* (ADB/BAD), and (c) Other Official Flows for development purposes (including refinancing Loans) which have too low a Grant Element (q.v.) to qualify as ODA” (DAC, 2005).

by multilateral institutions and by non-DAC countries to promote economic development and welfare in countries and territories in part I of the DAC list of aid recipients. It includes loans with a Grant Element of at least 25% (calculated at a rate of discount of 10%)” (UNDP, 2004).

The World Bank (2005) appears to follow the DAC/OECD definition of ODA.

U.S. Foreign Assistance

The United States also appears to follow the more limited OECD definition of ODA as defined by OECD, showing multilateral aid to the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) as a separate entity (Rice, 2005). ODA falls under a broader category of “Foreign Assistance”. This foreign assistance includes food aid, debt relief, demining, military education and training (Rice, 2005). In Fiscal Year (FY) 2004, U.S. ODA to Sub-Saharan Africa (SSA) amounted to US\$ 467 million, while total foreign assistance to SSA amounted to US\$ 3.4 billion in 2004. Food aid, as a portion of foreign assistance, to SSA amounted to US\$ 1.2 billion in FY 2004 (Rice, 2005).

At US\$ 2.62 billion and US\$ 1.87 billion respectively

“Israel and Egypt continue, as they have since the late 1970s, as the largest recipients (of foreign assistance), although Iraq, receiving over US\$ 20 billion for reconstruction activities since mid-2003, is the biggest recipient in FY 2004”

at US\$ 18.44 billion (Tarnoff & Nowels, 2004). Based on USAID (2005) foreign assistance statistics, US\$ 18,269,100,000 was allocated globally in FY 2004.³⁵⁹

³⁵⁹ Fiscal Year (FY) 2004 runs from October 1, 2003 until September 30, 2004

- Law Enforcement, mainly anti-drug trafficking: US\$ 1,198,200,000
- Military Assistance: US\$ 4,837,700,000
- Humanitarian Assistance:³⁶⁰ US\$ 2,514,700,000
- Multilateral Economic Assistance: US\$ 295,000,000
- Bilateral Economic Assistance:
 - Child Survival, US\$ 1,824,200,000
 - Development Assistance/ODA/Foreign Aid, US\$ 1,376,800,000
 - Global HIV/AIDS US\$ 488,100,000
 - Millennium Challenge Account, US\$ 994,100,000
 - Other. US\$ 4,683,200,000

The USAID (2004) statistics do not show the reconstruction of the Iraq budget of Tarnoff and Nowels (2004), which is separated out in graphs. Based on the Tarnoff and Nowels (2004) statistics, but excluding the Iraq reconstruction budget, 25% of U.S. foreign assistance is going to Israel and Egypt in FY 2004. If one adds the Tarnoff and Nowels (2004) FY 2004 Iraqi reconstruction budget to the USAID (2005) FY 2004 foreign assistance budget, totaling US\$ 36.71 billion, Israel's and Egypt's foreign assistance, totaling US\$ 4.49 billion in FY 2004, make up only 12.2% of total U.S. foreign assistance. By combining them with Iraq, these three countries alone account for 86% of the U.S. foreign assistance budget.

Bandow (2002) concludes that

“U.S. assistance has primarily been political and military, dedicated to buying and subsidizing friends; the large annual flows to Egypt and Israel have nothing to do with economic development”.

³⁶⁰ Humanitarian assistance includes Food for Peace (P.L. 480, Title II) as the largest portion of that line item at US\$ 1,184,900,000.

Under bilateral aid “Development Assistance” is basically ODA, as described by both Tarnoff and Nowels (2004) and USAID (2005). Programs such as Child Survival, global HIV/AIDS and Millennium Challenge Account, might also be considered true aid, although they are almost a form of crisis management to prevent catastrophes. Adding these four programs together, they total about US\$ 4.7 billion and thus, represent only about 26% or 18% respectively depending on whether the exorbitant cost of rebuilding Iraq is included. “Humanitarian Assistance” is primarily for famine/food relief and disaster/refugee assistance and though appreciated, has nothing to do with development. Based on data from Rice (2005), ODA to Sub-Saharan Africa amounts to from 1.3-2.5% of total U.S. foreign assistance in FY 2004. Including ODA, total U.S. foreign assistance to SSA ranges between 13-19% in total foreign assistance in FY 2004, depending on whether reconstruction of Iraq is included.

11.7.1.2 ODA

In 1969, Development Assistance Committee (DAC) of the OECD adopted the concept of "Official Development Assistance", separating ODA from "Other Official Flows" (OOF) and identifying ODA with an official target of 0.7% of GNI/GNP in the form of. By 1970, the United Nations adopted the 0.7% target (Fuhrer, 1996). When the world's governments met at the Earth summit in Rio de Janeiro in 1992, they adopted a program for action under the auspices of the United Nations -- Agenda 21 (see Chapter 9, Section 9.3, COMMUNITY BASED NATURAL RESOURCES MANAGEMENT (CBNRM) PROGRAMS – PART OF THE WAY FORWARD). Amongst other things, this included an Official Development Assistance (ODA) aid target of 0.7% of Gross National Product (GNP) for rich nations - roughly 22 members of the Organization for Economic Cooperation and Development (OECD) formed in 1960 – the club of advanced industrialized countries, known as the Development Assistance Committee

(DAC) (Global Issues, 2002). A decade later, the Monterrey Consensus and the World Summit on Sustainable Development “Earth Summit” of 2002 in Johannesburg all reiterated this pledge of 0.7% of GNI/GNP by OECD countries (Sachs, 2005) (Table 11.5).

Table 11.5: Official Development Assistance (ODA) from 2003 to 2006 at Current prices (2006, US\$ Millions)

Country	ODA in U.S. Dollars (Millions)				ODA as % of GNI (GNP)			
	2003	2004	2005	2006	2003	2004	2005	2006
1. Australia	1,219	1,460	1,680	2,128	0.25	0.25	0.25	0.3
2. Austria	505	678	1,573	1,513	0.2	0.23	0.52	0.48
3. Belgium	1,853	1,463	1,963	1,968	0.6	0.41	0.53	0.5
4. Canada	2,031	2,599	3,756	3,713	0.24	0.27	0.34	0.3
5. Denmark	1,748	2,037	2,109	2,234	0.84	0.85	0.81	0.8
6. Finland	558	680	902	826	0.35	0.37	0.46	0.39
7. France	7,253	8,473	10,026	10,448	0.4	0.41	0.47	0.47
8. Germany	6,784	7,534	10,082	10,351	0.28	0.28	0.36	0.36
9. Greece	362	321	384	384	0.21	0.16	0.17	0.16
10. Ireland	504	607	719	997	0.39	0.39	0.42	0.53
11. Italy	2,433	2,462	5,091	3,672	0.17	0.15	0.29	0.2
12. Japan	8,880	8,922	13,147	11,608	0.2	0.19	0.28	0.25
13. Luxembourg	194	236	256	291	0.81	0.83	0.86	0.89
14. Netherlands	3,972	4,204	5,115	5,452	0.8	0.73	0.82	0.81
15. New Zealand	165	212	274	257	0.23	0.23	0.27	0.27
16. Norway	2,042	2,199	2,786	2,946	0.92	0.87	0.94	0.89
17. Portugal	320	1,031	377	391	0.22	0.63	0.21	0.21
18. Spain	1,961	2,437	3,018	3,801	0.23	0.24	0.27	0.32
19. Sweden	2,400	2,722	3,362	3,967	0.79	0.78	0.94	1.03
20. Switzerland	1,299	1,545	1,767	1,647	0.39	0.41	0.44	0.39
21. UK	6,282	7,883	10,767	12,607	0.34	0.36	0.47	0.52
22. USA	16,320	19,705	27,622	22,739	0.15	0.17	0.22	
TOTAL ODA	69,085	79,410	106,776	103,940	-	-	-	-
USA % of total ODA	24	25	26	22	-	-	-	-

Note: The U.N. ODA agreed target is 0.7 percent of GNI. Most nations do not meet that target.

Source: Global Issue: <http://www.globalissues.org/TradeRelated/Debt/USAid.asp> extracted from OECD Development Statistics Online,

<http://www.oecd.org/dataoecd/50/17/5037721.htm>, with permission from OECD.

Table prepared by principal author

The U.S. ranks at the bottom of all donor countries (Booker & Colgan, 2004), U.S. foreign aid (Overseas Development Assistance/ODA) ranging from 0.11-0.15% of its GNP amounting to US\$ 16.254 billion in 2003 or 26% of all ODA, less than or about half the percentage of GNP Germany provides and less than 20% of the percentage GNP provided by the Netherlands (Mule, 2003). Between 2003-2006, the U.S. contributed between 22-26% of all ODA (see Table 11.5). “...much of the money has gone to corrupt, ineffective governments — down a rat hole,” according to Senator Jesse Helms of North Carolina” (Weinstein, 2002).

In 2005, the U.S. contributed US\$ 27.62 billion (0.22% GNP) in foreign aid compared to the next four highest contributors to foreign aid; Japan at US\$ 13.15 billion (0.28% GNP), Britain at US\$ 10.77 (0.47% GNP), Germany at US\$ 10.08 (0.36% GNP) and France at US\$ 10.03 (0.47% GNP) (Hudson Institute, 2007). In 2006, the U.S. spent US\$ 499 billion on its military compared to US\$ 22 billion in ODA. Although this makes the U.S. the biggest foreign aid donor in the world, this amounted to only 0.17% of the U.S. GNP compared to Britain and France at 0.52% and 0.47%, respectively (Munk, 2007).

The U.S. Government has argued that private donations make up a substantial portion of the shortfall in ODA. The total amount of money from nongovernmental development assistance for the United States is about US\$ 3 billion/year. If added to the total U.S. foreign aid, this raises the ODA from 0.15% to 0.18% of the GDP, still well below the 0.7% of the GNI/GNP pledged by Development Assistance Committee (DAC) members of the OECD (Sachs, 2005). In 2005 the Hudson Institute (2007) estimated total American “economic engagement” with the developing world as 1) private giving³⁶¹ globally at US\$

³⁶¹Includes foundations, corporations, private and voluntary organizations, universities and colleges, religious organizations and individual remittances (Hudson Institute, 2007). Unclear to the authors as to whether ODA channeled through many of these NGOs was factored out?

95.2 billion (50% of total – 3.5x ODA), private lending and investment at US\$ 69.2 billion (36% of total) and ODA of US\$ 27.62 billion (14% of total), totaling US\$ 192 billion and amounting to 0.98% of the U.S. GNP. Of the U.S. private giving, remittances by migrants to their families in countries of origin comprised the largest component amounting to US\$ 61 billion in 2005 (Hudson Institute, 2007).

Aid levels in 1999 were US\$ 10.8 billion compared to US\$ 17.9 billion in 1992, when development assistance to Sub-Saharan Africa reached its highest levels ever (Luna, Cox & Slengesol, 2001). Between 1996 and 2001, OECD statistics indicate that net ODA for Sub-Saharan Africa³⁶² ranged from a high of US\$ 15 billion in 1996 to a low of US\$ 12.2 billion in 2000 (Table 11.6) (see Chapter 12, Section 12.5, DEBT AND STRUCTURAL ADJUSTMENT POLICIES).³⁶³ Other estimates are that total ODA (Overseas Development Assistance) to Sub-Saharan Africa from all countries has declined from US\$ 19 billion (Guest, 2004)/US\$ 20 billion (Croal, 2002) in 1990. Net ODA to Sub-Saharan Africa was US\$ 17.2 billion in 2003, US\$ 16.7 billion in 2004 and US\$ 22.5 billion in 2005 (US\$ 19.2 billion, US\$ 19.3 billion & US\$ 24.7 billion, respectively for all of Africa), in 2007 prices (OECD, 2007).

This amounts to ODA declining from US\$ 32/person in 1980 to US\$ 22/person in 2001 in Sub-Saharan Africa (Sachs, 2005). Luna, Cox & Slengesol (2001) estimate Aid/ODA to SSA fell from US\$ 32 per head in 1990 to US\$ 19 by 1998. The Commission for Africa (2005) estimates that foreign aid/ODA averaged only US\$ 25-30/person/year in Sub Saharan Africa compared to US\$ 9-10 per capita/year in FDI and US\$ 4-5 per capita/year in remittances.

³⁶² Sub-Saharan Africa = Africa minus Egypt, Tunisia, Algeria, Morocco and Libya.

³⁶³ Note. In 2002 ODA was US\$ 17.2 billion dollars (see Chapter 11, Section 11.6.7, Foreign Aid and Puppet Governments – “Donor Democracy”, Table 11.4: Official 2002 development assistance (ODA = foreign aid) as a percentage of all investment inflows to Sub-Saharan Africa)

In 1995, the director of the U.S. Agency For International Development (USAID) defended his agency by testifying to Congress that 84 cents (84% of all foreign aid from the USA) of every dollar of aid goes back into the U.S. economy in goods and services purchased. For every dollar the United States puts into the World Bank, an estimated US\$ 2 actually goes into the U.S. economy in goods and services (Aristide, 2000 *In: Global Issues*, 2002). Similarly, Sankore (2005) estimates that for every dollar of AID to Sub-Saharan Africa, Western economic interests take out a minimum of US\$ 2. In 1995, severely indebted low-income countries paid one billion dollars more in debt and interest to the International Monetary Fund (IMF) than they received from it. For the 46 countries of Sub-Saharan Africa, foreign debt service, mostly from bilateral and multilateral foreign aid loans, was four times their combined governmental health and education budgets in 1996. So, we find that aid does not aid (Aristide, 2000 *In: Global Issues*, 2002) (see Section 11.7.4, Foreign Aid and Debt and Chapter 12, Section 12.5, DEBT AND STRUCTURAL ADJUSTMENT POLICIES).

Country	ODA net total, All donors (US\$ Millions or 1,000,000s)					
	1996	1997	1998	1999	2000	2001
Algeria	304	250	394	89	162	179
Angola	473	355	335	388	307	267
Benin	288	221	205	211	239	273
Botswana	75	122	106	61	31	28
Burkina Faso	420	368	400	398	336	389
Burundi	111	56	67	74	93	126
Cameroon	412	499	499	434	380	397
Cape Verde	117	111	130	137	94	76
Central African Republic	170	91	120	118	75	74
Chad	296	228	168	188	131	178
Comoros	39	27	35	21	19	28
Congo	166	158	125	132	184	236
Congo Democratic Republic	429	270	66	142	33	71
Cote d'Ivoire	965	446	967	448	352	181
Djibouti	97	85	81	75	71	54

Table 11.6 (Cont.): Net Overseas Development Assistance (ODA)/Foreign Aid To Africa, 1996-2001

Country	ODA net total, All donors (US\$ Millions or 1,000,000s)					
	1996	1997	1998	1999	2000	2001
Egypt	2 199	1 985	1 955	1 582	1 328	1 254
Equatorial Guinea	31	24	22	20	21	13
Eritrea	159	123	167	149	176	278
Ethiopia	818	579	660	643	693	1 067
Gabon	127	39	45	48	12	7
Gambia	37	39	39	34	49	51
Ghana	651	494	702	609	609	651
Guinea	299	381	359	238	153	251
Guinea-Bissau	181	124	96	52	80	59
Kenya	597	448	415	310	512	437
Lesotho	104	92	61	31	37	54
Liberia	173	76	72	94	68	33
Libya	8	7	7	7		
Madagascar	357	834	481	359	322	354
Malawi	492	344	435	447	446	401
Mali	491	429	347	354	360	350
Mauritania	272	238	165	219	212	262
Mauritius	20	43	42	42	20	22
Morocco	650	464	530	679	419	516
Mozambique	888	948	1 040	805	877	934
Namibia	188	166	181	179	153	107
Niger	255	333	292	187	211	248
Nigeria	190	200	204	152	185	184
Rwanda	467	230	350	373	322	285
Sao Tome and Principe	47	33	28	28	35	38
Senegal	580	423	501	535	423	418
Seychelles	19	17	24	13	18	14
Sierra Leone	184	119	106	74	182	332
Somalia	88	81	80	115	104	144
South Africa	364	496	514	541	488	426
Sudan	220	139	209	243	225	166
Swaziland	33	28	35	29	13	29
Tanzania	877	945	1 000	990	1 022	1 215
Togo	157	125	128	71	70	46
Tunisia	124	194	150	253	223	377
Uganda	676	813	647	590	819	774
Zambia	610	610	349	624	795	365
Zimbabwe	371	336	262	245	178	158
Africa	20 005	17 997	17 682	16 025	15 687	16 183
Africa Calculated by Authors from above data	18,366	16,285	16,401	14,880	14,369	14,875
ODA Sub-Saharan Africa	15,080	13,385	13,365	12,270	12,236	12,548

Note: ODA: Overseas development assistance.

Sources: OECD (2002), Geographical Distribution on Financial Flows to AID Recipients

Despite US\$ 1 trillion in loans since the 1960s, the per-capita growth rate of the typical developing country over the past 20 years was zero (Weinstein, 2002). On

the average, one year of foreign aid/ODA to Sub-Saharan Africa is the equivalent or more to the US\$ 12 billion Marshall Plan³⁶⁴ that rebuilt Europe after World War II, but with little to show for all of this spending. Rosenblum and Williamson (1987) estimated that total foreign aid/ODA to SSA was about US\$ 9 billion/year, the Western donors spending US\$ 116 billion between 1960 and 1986 in Sub-Saharan Africa, the equivalent of 9.7 Marshall Plans; Guest (2004) estimating the equivalent of six Marshall Plans. Sogge (2002a) estimated foreign aid/ODA at US\$ 16 billion in 1998, more than enough to help the continent begin developing, except the money is not put where the rhetoric is and in fact, is really not meant for development.

Unless used properly, a decline in ODA may be the best thing that ever happened to the subcontinent, forcing the richest continent in the world to start developing based on transforming its natural resources in Africa. In addition, although Sub-Saharan Africa has received 60% of increases in overall ODA disbursements over the five year period between 1998 and 2003, most of these funds have been allocated to post-conflict situations, leaving little for development aid (GDF, 2005).

The July, 2005 G-8 summit in Gleneagles, Scotland, pledged an additional US\$ 25 billion/year in ODA to Africa by 2010, a total of US\$ 50 billion/year to all developing countries (DeCapua, 2005a). Though it is unclear, given that the most impoverished nations are on the subcontinent, it must be assumed the majority of this increase will go to SSA. If this aid is spent on basic needs in Africa and issues such as education and health, as opposed to technical assistance (experts and consultants where the revenue flows back to the donor country), it may be of

³⁶⁴ Marshall Plan from 1948-1951 cost about US\$ 12 billion to rebuild Europe after WWII,
<http://www.infoplease.com/ce6/history/A0831964.html>,
<http://www.encyclopedia.com/html/M/MarshallP11.asp>
<http://www.factmonster.com/ce6/history/A0831964.html>
http://www.answers.com/topic_marshall-plan

some value. How important is this increase in ODA versus needs? “Even if the Millennium Development Goals (see Chapter 13, Section 13.12.5, Poor Track Record in Achieving United Nations “Millennium Declaration” Goals) are reached in 2015, more than 1 in 5 people in Sub-Saharan Africa (20% of the population) will still be living in extreme poverty” (Greenhill & Watt, 2005) unless development goes beyond ODA. If ODA remains the primary form of foreign investment in Sub-Saharan Africa, it is likely that the majority of the population will continue living subsistence lifestyles, while governments will remain in a perpetual state of welfare, neither of which is sustainable and that typifies the subcontinent in 2005.

11.7.2 Foreign Assistance Conditionalities Good Business for Donor County Not Recipient/Host Country

“Africa, once the province of district officers and missionaries, was suddenly a hothouse of every amateur development theorist, social engineer, tank salesman, unemployed mercenary, rogue industrialist and purveyor of unwanted pesticides. Some misguided projects were designed with the best of intentions; others were outright fraud. Often African leaders were less interested in a project’s effect on their people than in the size of the kickback” (Rosenblum & Williamson, 1987).

In the 1980s, a backlash by the U.S. government to corruption in government-to-government foreign aid/assistance resulted in aid being funneled through U.S.-based NGOs and consulting firms. Even allowing for corruption, their high overheads and salaries soaked up much of the aid, costing more than running money through host country ministries, and took away a sense of ownership and a long-term fostering of self-sufficiency by these countries. In turn, these U.S.-based aid contractors lobbied Congress to protect their programs with budget earmarks, regardless of whether these programs were priorities for host countries. This resulted in low flexibility of aid/assistance to meet development needs. In the 1990s, under the William (Bill) Jefferson Clinton administration, foreign

assistance cash was “smuggled” into other parts of the federal budget, being split among more than a dozen accounts, often duplicating efforts and being at cross-purposes. Foreign aid became politicized, serving special-interest lobbying over the interests of developing countries (Washington Post, 2006).

Foreign assistance is big business for donor country consulting firms, in the U.S. called “Beltway Bandits”, large numbers being situated around the 495 Beltway that encircles the center of power and wealth, Washington, D.C., as well as for Non-Governmental Organizations (NGOs). There are simply too many people trying to get their hands on the aid dollar. As long as aid has to serve the interests of foreign businessmen, aid bureaucrats and African governments the poor will see very little of it (Elwood, 1984).

“ ‘Aid is the way in which the Western world is helping lift Africa out of the poverty’- a comforting myth propounded by politicians and aid bureaucrats that we are ‘doing our bit’ for Africa’s poor. But aid has become a business - a big business - and it has a lot of goals other than helping the poor” (Elwood, 1984).

“In that notorious club of parasites and hangers-on made up of the United Nations, the World Bank, and the bilateral agencies, it is aid and nothing else that has permitted hundreds of thousands of ‘jobs for the boys’ and that has permitted record breaking standards to be set in self-serving behavior, arrogance, paternalism, moral cowardice, and mendacity” (Morris, 1995).

Most of foreign assistance grants/loans come with “conditionalities”, requiring that a large percentage of goods and services be purchased from the donor country including:

- Employment of “Expatriate Experts” from the donor country.
- Most project materials and supplies must be bought in from the country of the donor.

The Commission for Africa (2005) calls this “tied aid”, in which developing countries are required to buy the goods and services from the Western donor

country. They estimate a reduction in value of 30%, which appears too low compared to the above figures and recommend that it should be scrapped. In other words, the majority of aid needs to stay in the developing country and be spent on development (e.g., developing health and education, infrastructure and capabilities). The net results are that (CBO, 1997):

- “The aid may be given with the best interests of the donor in mind, not those of the recipient country.
- The subsidy involved in concessional aid may benefit the exporter rather than the recipient.
- Linkages between the development projects and the local economies are not formed. Thus, the local economy derives little long-term benefit from the projects”.

In the USAID funded programs in which the principal author worked, about 90% of the bilateral foreign aid/ODA money returned to the country of origin. Others estimate from 70% (Global Issues, 2002) to 84% of every dollar from U.S. foreign aid goes back into the U.S. economy in the purchase of U.S. goods and services (Aristide, 2000 *In: Global Issues*, 2002). Jeffery Sachs (2005) estimates that in 2002, of the ODA reaching developing countries (some went to middle-income countries, debt relief grants and repaying loans to rich countries), only around US\$ 15 billion or 31% of the US\$ 48 billion went to basic needs (e.g., health, education, clean water). Of the US\$ 30/Sub-Saharan African in ODA in 2002 from all countries, US\$ 5 or 17% went to consultants from donor countries, US\$ 3 or 10% for food aid (e.g., subsidizing American and European farmers) and other emergency aid, US\$ 4 or 13% to service Sub-Saharan Africa’s debts, US\$ 5 or 17% for debt relief operations and the remaining US\$ 12 or 40% supposedly to on-the-ground programs (Sachs, 2005),³⁶⁵ though much of this was likely consumed by government bureaucracies and NGOs, with little reaching the poorest of the poor. Thus, a minimum of 60%, but likely more, went back to the

³⁶⁵ Sachs’ (2005) breakdown is minus US\$ 1/person that is US\$ 29/person as opposed to US\$ 30/person.

Western donor countries from the purchase of goods and services, as well as for debt servicing/relief by the recipient countries in Sub-Saharan Africa. Jeffrey Sachs (2005) estimates in 2002 that the United States contributed US\$ 3/Sub-Saharan African, globally spending about US\$ 15 billion on ODA in 2004 (US\$ 19.7 billion indicated in Table 11.5), while spending US\$ 450 billion in military aid.

“After taking out parts for U.S. consultants, food and other emergency aid, administrative costs, and debt relief, the aid per African came to a grand total of 6 cents” (Sachs, 2005) or 2% of foreign aid, the remainder or 98% returning to the U.S.

While working as an “expert” for a private sector “Beltway Bandit” contracted to USAID, this included among others:

- Salaries of Expatriate Experts which were about seven times higher or more than their host country counterparts;
- Importation of Duty-Free Household Goods and Vehicle;
- Free housing (better than most could afford in their own country, gardeners and security guards to protect them from the “have-nots” who they have come to help);
- Placement of children in the best private schools of choice anywhere in the world.
- Vacation trips for children to visit parents;
- Once a year, trip to the home country for the expert, spouse and children living with them;
- Exclusive use of the U.S. Embassy Commissary where one could buy American products as opposed to locally produced ones;
- *Per diem* for all field trips, which covered fuel, lodging and meals;
- Exemption from paying both host country and donor country taxes;

- An overhead for the “Beltway Bandit” consulting firm who was awarded the contract. Usually the overhead, which had to be justified by an audit, was 1-1.5 times the cost of the basic proposal. This helps pay the cost of the headquarters building and all support staff salaries, plus trips for the “home office” to visit the overseas project site once to twice a year to see how their project staff are doing – which is often judged at a political level (e.g., getting along with counterparts, going along with the political agenda of the donor country and host country, regardless of the consequences of the project on the environment or the people), as opposed to a technical performance level; and
- “Learn to Love America” trips for carefully selected host country counterparts, which the donor wishes to influence ideologically.

Thus, expatriate experts spend little of their salaries or donor project money in the host country, contributing very little to the host country economy, but very much so to that of the donor country. The biggest economic benefit is likely the rental of houses in the host country (country receiving aid) owned by the elite. In the late 1980s, it is estimated that there were 80,000 expatriate “experts” in Africa, costing US\$ 8 billion/year, while African university graduates were unemployed (Rosenblum & Williamson, 1987; 1990). NGOs, because they are not-for-profit, will pay slightly lower salaries and benefits, but will operate in a similar manner.

At the end of most projects, which last between three and five years on average, the host country is left with a fleet of run-down vehicles and paper reports. When the project ends, this so-called “development” remains dependent on outside funding from the world’s taxpayers or it comes to a halt. There is no sustainability since this would have depended on the private sector, host country or foreign, generating wealth from sustainably extracting, transforming and marketing the resources of the host country. In the 1970s, through to the 1990s,

the private sector was not part of the foreign aid plan even though many donors had private sector sections within their agencies. What the donors called the private sector had more to do with small farmers and micro-enterprises that are certainly important. However, it rarely dealt with helping FDI and joint ventures between foreign and local entrepreneurs to establish factories that could transform raw products, develop commercial agriculture to feed the urban masses and create a middleclass (see Chapter 5, Section 5.7.6, Weakness of Entrepreneurship and The Private Sector, Constraint to Food Production).

Madsen (1999) provides an excellent example of this foreign aid industry,

“The Rwandan people remain traumatized by the events of 1994. The country is kept alive by a combination of official and NGO assistance programs. In fact Kigali’s only functioning industry appears to revolve around the government bureaucracy and the international aid organizations...Rwanda is almost totally subservient to the indefinite provision of aid from the rest of the world as well as dictates from the Pentagon and Uganda’s Museveni”.

The “assistance industry” is lucrative; the newly arriving NGOs following the 1994 genocide being called the “New Klondikers” participating in a gold rush. In Goma (the Democratic Republic of Congo) alone, there were about 100 NGOs (see Chapter 13, 13.8.6, Former Cold War allies vying for power in the Great Lakes Region).

Speaking of so-called experts and foreign interventions into five year plans in the Central African Republic, O’Toole (1986 *In:* Giles-Vernick, 2002) states:

“ ‘...French and other foreign advisors, continued to seek economic development through a centrally controlled productionist approach without any attempt to consult with agriculturists (small farmers) who are the basic producers in this overwhelmingly agricultural economy. The only benefactors of this persistence in the face of failure are the planners themselves and those who supply the spate of imported goods and technical assistance with which each new centrally planned project is launched’ ” (see Chapter 7, Section 7.8.3, Environmental Impact Assessment (EIA) Industry – No Hippocratic Oath).

Sachs (2005) implies the need for conceptual application of the medical “Hippocratic type oath” of ethical responsibilities in the foreign assistance and development fields/industries. This implies that donors, consulting firms, NGOs and government bureaucrats/politicians should be held responsible for their actions with regards to human rights and welfare of the people they are supposed to be helping. As a technical advisor to the Gambia River Basin Authority (OMVG) in the 1980s, when the principal author and his counterpart asked to take planned development alternatives into the rural areas and small towns to solicit input from farmers and other stakeholders, they were told by the chief technical advisor, Mamour Gaye, that that was not how planning was to take place. First, the OMVG bureaucrats and host country politicians would determine the appropriate road to development that circled around farming. Then we would go into the field to explain to basin residents what we were going to do for them, which if the politicians had had their way would have been catastrophic for both the people and environment due to the politicization of inappropriate dam sites (see Chapter 7, Section 7.8.5, Politics of Proposed Dams on The Gambia River). These top-down Western donor funded projects have, and continue, to wreck havoc on the lives of the poor across Sub-Saharan Africa, with the main beneficiaries being technical assistants/NGOs, consulting firms, construction companies and donor/host country bureaucrats. After about 40 years of foreign aid, most Africans are poorer and have lower standards of living than at

independence and economies are worse off, not better off, as a result of Western donor interventions.

In the USA, a separate agency, Overseas Private Investment Corporation (OPIC)³⁶⁶, is the major donor agency, which is supposed to deal with the private sector, providing low interest loans in high-risk developing countries. While there must be some benefits to Africa from this process, in all the years the principal author has been in Africa (1977-2006), not one such investment has been personally observed. In 2002, for the first time, he ran into OPIC linked to a government office encouraging private investment in Uganda and low cost insurance on that investment.

The principal author's impression is that, many of the donor bureaucrats, "Beltway Bandits" and NGOs were and are afraid of the private sector. If the private sector in Sub-Saharan Africa worked and the economies of the subcontinent, as they should be, were driven by the private sector, there would be no need for foreign aid and the large "development industry" which has grown-up around foreign aid. The private sector, especially the international private sector, has been no angel in Africa and while it is believed they are the way forward for the future of Sub-Saharan Africa, they also have long strides to make to assure their constructive role in the future of the African subcontinent (see Chapter 13). Their role must greatly evolve along with transparency, accountability and responsibility for their actions, though this is true for all stakeholders, including African governments. Meanwhile, the local private sector, hunters, farmers, pastoralists, fishermen, honey collectors, etc., are often compromised and constrained by foreign aid funded conservation and development programs which cut them off from accessing their resources (see Chapter 9, Section 9.7.2.1, Devolution Through Policy Reform, Land and Resource Tenure; Section 9.7.6.3,

³⁶⁶ 1100 New York Avenue, NW, Washington, D.C. 20527, Tel: 202-336-8400, www.opic.gov

Accountability, transparency and the creation of capitalist structures within communal systems and Section 11.11, CASE STUDIES, USE OF FOREIGN AID TO IMPOSE WESTERN PRESERVATION PHILOSOPHIES ON RURAL AFRICANS).

On the positive side, one of the best things the donors have done is to send host country nationals, mostly bureaucrats, off to their countries for university degrees. However, the cost of such an education can be four to five times higher than educating them on the African continent, even in South Africa where the university (tertiary) education is “First World” in quality and more relevant with Western economic, business and conservation concepts adapted to the subcontinent. Though exact figures are not available, it is estimated, other than for workshops and short-courses, long-term (e.g., two years or more) training of Africans from foreign aid is less than 1% of the total aid budget, where it should be minimally 10-20% if significant gains are to be seen in creating a critical mass of educated Africans able to influence change on the continent.

“A 1997 newsletter of the U.S. Agency for International Development (USAID), the government agency in charge of U.S. foreign assistance, put it this way: ‘The principal beneficiary of America’s foreign assistance has always been the United States. . . . Foreign assistance programs have helped the United States by creating major markets for agricultural goods, new markets for industrial exports and hundreds of thousands of jobs for Americans.’ The same report argued forcefully that the amount of money spent on aid be upped significantly in order to maintain U.S. ‘leadership in the global arena’ ” (Lappé, *et al.*, 1998).

Leadership could mean using foreign aid to buy votes and influence at forums such as the United Nations, influencing national policies, helping multi-nationals obtain lucrative resource extraction contracts, or educating a host country national

in Western ideologies at Western universities. This use of foreign aid exemplifies Western aid in general.

11.7.2.1 CARE, caring for whom?

Helping people is hurting people. People want to believe that Save The Children saves the children, that CARE cares, that Feed The Children is feeding children. CARE, Catholic Relief Services (CRS), World Vision and Save the Children are government contractors more than charities. The more they believe, the more money these NGOs get. The aid money keeps coming in because the U.S. government has political and strategic interests. In Somalia, it was all about a military base in northern Somalia and so the U.S. was not going to tell Siad Barre, the dictator, that he could not have his food aid. Therefore, all this aid money from the U.S. Government was subcontracted to NGOs, largely CARE. What became obvious, however, was that they were delivering to refugee camps that should not have existed (Might Magazine, 2002; Sogge, 2002a). All along the way, governments, local leaders and militias took their cut of the food aid. Somebody always gets rich off a famine (Might Magazine, 2002) (see Section 11.8.7, Food Aid and War in Somalia). The principal author saw donated rice, during the drought of the 1970s/80s, diverted and being trucked for sale in the Casamance, Senegal; a rice-growing region with little need for more rice.

In order to do humanitarian aid work in Somalia, Kenya, Liberia or Rwanda, you inevitably have to help one side in a civil war against the other. If there isn't a war situation, food aid supports the status quo, the government in power. They are the ones who are choking off farmers and not allowing them to sell grains or coffee etc. to the highest bidder (Might Magazine, 2002).

“Ads give the impression that all these Africans are a bunch of infants who will starve to death if a bunch of 25-year old volunteers aren’t sent over there to take care of them. The whole aid industry is built on this conceit that Americans (and other nationalities) can go into an African village and, by virtue of some innate quality of American-ness, have something to offer people, something that you can teach people there...‘Do you really think people can’t take care of themselves? Where do people get the idea that Africans are gonna really suffer if a bunch of American volunteers go home? It’s an absurd notion” (Might Magazine, 2002).

“Aid is about people here getting their hands on government money. Seventy (70%) to 84%, if not more of all aid money stays in the U.S. It goes to salaries, to U.S. corporations; that's what it's about...The list of private companies making money is huge...We don't look at CARE in that way. We're not willing to say, CARE is making money from this as well. In fact, they are. They're paying their salaries, they're expanding, they're hiring new people, making capital investments - they're just not paying taxes on it” (Might Magazine, 2002) as a not-for-profit NGO.

Let us keep that food aid and other forms of foreign assistance coming so we can justify our NGO existence, whether the people need it or not.

11.7.3 USA/Western Foreign Policy - Strategic Africa

The modern concept of foreign assistance emanated from the Marshall Plan after World War II to help rebuild Germany and Japan. Eventually, foreign assistance became a political tool to buy allegiance from developing countries against the Russians, Chinese and Cubans during the protracted Cold War of the 1960s, 70s, 80s and early 90s.

Today foreign assistance appears to be over buying political favors to extract Africa petroleum, other minerals, timber resources, wildlife and raw agricultural

products as cheaply as possible by Western Multi-Nationals with backing by their governments.

“US interest in Africa is growing steadily. The ‘trade not aid’ policy and Clinton’s ‘Treaty for African Opportunity’ are being revamped by the Bush administration along the lines of oil and security. Military supplies, training, and advisors have increased, while aid has been reduced. Now what counts is the map of oil fields and the location of the main minerals that are strategic for the USA. The new approach is more pragmatic and to the point, consisting essentially in assuring that the USA will benefit from the most favorable conditions for exploitation, with the direct support of the military apparatus” (Jampaglia, 2002) (see Chapter 13, Section 13.8, FRANCE/US ANGLOPHONE COMPETITION FOR INFLUENCE AND RESOURCES IN AFRICA – NEW SCRAMBLE FOR AFRICA).

Regardless of whether it is bi-lateral aid or multi-lateral aid such as the World Bank and International Monetary Fund (IMF), Western donor interventions in Sub-Saharan Africa have been, and are, short-term and exploitative.

“One of the root causes of poverty lies in the powerful nations that have formulated most of the trade and aid policies today, which are more to do with maintaining dependencies on industrialized nations, providing sources of cheap labor and cheaper goods for populations back home and increasing personal wealth, and maintaining power over others in various ways” (Global Issues, 2002) (see Chapter 12, SUBSIDIES, FREE-TRADE, STRUCTURAL ADJUSTMENT AND DEBT RELIEF IN AFRICA, IMPACTS ON RESOURCE EXPLOITATION).

A study for the U.S. Congress (CBO, 1997) raised the issue that economic growth from foreign aid in developing countries may not be in the best interest of the U.S. Government,

“even if U.S. foreign aid does the job of promoting economic growth overseas, it will have adverse consequences for the United

States. Economic growth among developing countries means that they have become competitors in the global market. Cheaper wages in developing countries allow foreign competitors to charge prices that are lower than those for comparable U.S. goods in world and domestic markets, critics would claim, thus causing the United States to lose jobs”.

It goes on to say that using foreign aid to help the poorest of the poor, though laudable, is impractical and ineffective and would be best spent on countries and policies that directly support U.S. national interests.

11.7.3.1 FIDES and Aid Welfare

As a means of stemming a desire for self-rule in Francophone Africa, the Brazzaville Conference of 1944 determined that supplying the colonies with “equipment” and bestowing on them the honor of “Overseas France” would “obviate all possibility of autonomy or of evolution outside the French Empire”. The outgrowth of this was a beginning of foreign assistance in Africa known as the *Fonds d'Investissements pour le Développement Economique et Social* (FIDES). Until 1966, FIDES and later *Fonds d'Aide et de Cooperation* (FAC), which replaced FIDES, granted money only for research, agricultural production and “infrastructure of society”. The absence of any department for industry was very revealing, as the kind of aid provided by the French could only prolong the ‘raw material’ economy of Africa (Dumont, 1966). René Dumont (1966) recommended to the FAC directors in 1961, the reduction of aid in propping up tottering budgets and expenses for infrastructure (which should be covered internally by a country’s economy) in favor of grants for agricultural units, vocational training and, above all, industrialization as a means of developing African economies that could pay for education, health care and infrastructure, as well as derive taxes to cover government budgets. His recommendations fell on deaf ears. René René Dumont (1966) concluded that the

“FIDES precedent of the ‘political gift’ continues to inhibit development in Africa. The peasant is accustomed to receiving everything free, and is encouraged in this attitude by the spectacle of innumerable privileged civil servants. It is hard to persuade him to make the great efforts necessary for agricultural development. His leaders have chosen the easy way out, preferring to make liberal promises, rather than get down to work”.

In essence, France and the West in general, with foreign assistance, have developed “welfare states” living off international handouts with similar consequences to those of welfare in America’s inner cities and Indian reservations; the break-up of traditional values and societies, the loss of self-esteem, pride and dignity, and escape from all of this through drugs and/or alcohol. Aid was not meant for development, but continued dependency on and exploitation by the former “Mother country”, in this case France. You can be assured that the approach of the other colonial powers (e.g., Great Britain, Spain, Portugal and Belgium) towards foreign assistance, and eventually the USA, was, and is, no different today in 2008.

11.7.3.2 Eco-welfare Uganda, 2002

The Uganda Game Department (UGD) was created in 1926 to manage game reserves, while Uganda National Parks was established in 1952 with the creation of Murchison Falls National and Queen Elizabeth National Parks (Child, *et al.*, 2004a *In:* Child, B., 2004a).

Wildlife in Uganda has been reduced by 95% as a result of civil wars in the 1970s and 1980s (1972-1985), along with continued human population growth. However, during this period, park habitat remained largely intact and unencroached (Child, *et al.*, 2004a *In:* Child, B., 2004a), though heavily poached.

In the long run, lack of benefits to an ever-increasing human population risks, as in Kenya, pushing people to opt for other land uses; encroachment by agriculture and livestock in parks and game reserves being a bigger threat than poaching. Uganda's game reserves have always been the poor second cousin to the national parks system. Since 1996, park and reserve management have been consolidated under one, the Uganda Wildlife Authority (UWA) (Child, *et al.*, 2004a *In:* Child, B., 2004a).

In 1978, all game utilization was banned in Uganda (Averbeck, 2001). Child, *et al.* (2004a *In:* Child, B., 2004a) place the ban on hunting as 1985. However, by 1996, Uganda adopted a new Wildlife Statute. The statute vests ownership of wildlife with the state but makes provision for people to own any wildlife that has been lawfully taken. Part VI of the statute provides for different categories of "user rights", like hunting, farming, ranching, general extraction and trading with wildlife products. This was intended to motivate communities and individual landowners to conserve wildlife through sustained use (Averbeck, 2001).

The official statistics are that 70% of the Uganda Wildlife Authority's (UWA) budget comes from Western donor handouts (Kaye, *pers. comm.*), implying that the current tourism industry is not generating enough money for the UWA to stand on its own. It is said that in the 1960s Murchison Falls alone had over 60,000 visitors/year (Speidel, *pers. comm.*), while Child, *et al.* (2004a *In:* Child, B., 2004a) estimate 3,000 tourists/week to Murchison Falls during this time frame. Due to unrest along its borders, where most of the parks are found, it is said today (2001) that only 5,000 tourists come to Uganda/year (Speidel, *pers. comm.*), Child, *et al.* (2004a *In:* Child, B., 2004a) estimating 3,000-5,000/year by the mid-1990s. Given these facts, it is likely that over 90% of the UWA's income comes from donor handouts in a welfare relationship.

For instance, Murchison Falls Park only covers 51% of its expenses, the remainder being covered by Western donors. This is believed to be typical of most of Uganda's parks. There is so little money going from the parks to peripheral communities, who are supposed to share in 20% of the gate fees that Western donors are taking up this obligation. Yet GTZ³⁶⁷ has spent US\$ 25 million over ten years in Murchison Falls Park, with little to show for sustainability. It is said that the major source of income is from car ferry fees, while connected Indian businessmen who control the lodges, pay little or nothing back to UWA (Speidel, *pers. comm.*). This is both welfare and not sustainable. Some of this is due to a bureaucratic failure, but most of it is due to the fact that the tourists are not there. The World Bank and Global Environment Facility (GEF) approved US\$ 28 million for the UWA in 2002 (Child, *et al.*, 2004a *In:* Child, 2004a). How is it to pay back this and other loans?

The potential for ecotourism in Uganda is incredible, maybe better than anywhere else in Africa, especially in Western Uganda with Bwindi (gorilla viewing and afromontane forests), Queen Elizabeth (unique plains game of the Nile Basin and elephant), the Rwenzoris/Mountains of the Moons (Bakonjo culture, unique vegetation and snow capped mountains), the Semliki Valley (Pygmies and tropical lowland forests) and Murchison Falls (plains game and waterfalls); one of the most ecologically diverse environments anywhere in the world over such a short distance.

Civil wars and current political turmoil along the borders, with loss of lives of national and international tourists, has brought Uganda's ecotourism to a halt. However, civil wars in Zimbabwe and Mozambique never stopped the hunters from coming. If opened, hunters will come to Uganda tomorrow, as proven during

³⁶⁷ Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Collaboration), German Donor Agency

the Zimbabwe and Mozambique civil wars. Hunting is low volume, high paying tourism and does not need many clients to generate wealth from wildlife. Africa's relying purely on eco-tourism to protect wildlife and generate wealth is extremely dangerous given the current unstable political environment over most of the continent, which scares off eco-tourists (Child, 1995). The killing of tourists in the gorilla watching area of Bwindi Impenetrable Forest by Rwandan guerrillas, security problems by a secessionist movement in the Rwenzori/Mountains of the Moon and the machine gunning of Ugandan tourists in Murchison Falls, virtually halted tourism (Child, *et al.*, 2004a *In:* Child, B., 2004a).

Meanwhile, what little money is available from the donors is pushed into the parks. Ugandan parks' poor second cousin, the game reserves, generate little or no income and are being poached and invaded by livestock, honey collectors, small farmers, etc. – a wave of human poverty. In many cases, they are paper tigers that exist only on maps, but which in the field are barely functional due to a lack of resources.

There is a nucleus of wildlife in game reserves from which Uganda could generate immediate income, while protecting these populations to allow them to grow in numbers and generate even more income. Initially, Lamprey, Buhanga and Omoding (2003) estimate that trophy hunting in Uganda could support 1-2 safari operators, especially in game reserves such as, "Bugungu Wildlife Reserve (WR), Karuma WR and East Madi WR. Others with potential, but unlikely to be included due to their importance to UWA for game-viewing tourism, are Kigezi WR, Kyambura WR and Toro-Semliki WR".

In 2002, the principal author was involved in presenting a proposal to the UWA. This proposal estimated that with about four game reserves, it could initially

generate US\$ 220,000/year for the UWA. In addition to money for UWA, it was recommended that 25% of the US\$ 220,000 (about US\$ 55,000) should go to communities, along with another US\$ 27,000 that the safari company would raise for community development. The company would also employ 50 full time and 50 part time staff in hunting. This income generation is based only on hunting of very conservative quotas and does not include income and employment from sport fishing and ecotourism, which the company planned to develop. At the time, these game reserves were sitting idle with little or no infrastructure (see Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders).

The company planned an integrated approach which would include wildlife monitoring based on adaptive management principles in collaboration with UWA, the Makerere University Institute of Environment and Natural Resources (MUIENR) and community employment – including employment of reformed poachers, training and development, tertiary training in nature conservation, some access to natural resources through development of a land use plan, increased access through road building and maintenance, permanent camps and a year round presence in the area for the purposes of anti-poaching.

Although his partner struggled with this idea, the principal author also wanted, within five years, for the community to run and operate the hunting camps. In essence, the camps would belong to them and the safari operator would set the standards and bring in the clients.

Game reserves serve as buffers to parks. By allowing the private sector to co-manage the game reserves with UWA and local communities, biodiversity would improve in both game reserves and parks as game populations improve and habitat recovers from uncontrolled exploitation. This project was never approved.

Although there is a pilot hunting program around Lake Mburo on private ranches, the income it can generate is minor, plus it is questionable whether in the long run wildlife in this area will be able to compete with agriculture as a land use [see Section, 11.11.2, Donor Driven Conservation, Lake Mburo National Park (LMNP), Uganda].

The welfare relationship which UWA has developed, in living off handouts from Western donors and animal rights groups such as International Fund for Animal Welfare (IFAW)³⁶⁸ (Thomson, *pers. comm.*), is not sustainable. As discussed, donor funding runs in 2-5 year cycles. Historically, donor fatigue will set in and funding will disappear. Donor welfare seems to be hampering UWA's ability to make sound economic decisions. There is no doubt that the Western donors have been infiltrated by animal rights groups and that they reflect the Western urban bias of preserving wildlife, in favor of using wildlife as an economic resource (conservation). Both Kenya and Uganda are known to harbor such groups and their conservation (or better put - preservation) policies and politics are heavily influenced by them. According to Thomson (*pers. comm.*), the Director of UWA, Dr. Arthur R. Mugisha, was sent off for advanced university training by International Fund for Animal Welfare (IFAW), a known animal rights group that also heavily influences Kenya's conservation politics (see Section 11.11.9, Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact on Kenya's Wildlife Outside Parks).

In conclusion, Ugandan conservationists must ask themselves why cattle, goats and sheep are thriving, while wildlife and wildlife habitat is shrinking. Given current government policies, rural communities are making sound economic decisions. It is economics reaching down to the level of impoverished rural communities, not foreign welfare, which will save Uganda's wildlife and provide

³⁶⁸ International Fund for Animal Welfare (IFAW), PO Box 193 • 411 Main Street Yarmouth Port, MA, 02675, USA. <http://www.ifaw.org/ifaw/general/default.aspx>.

some of its people with a future. Ultimately, as discussed in Chapter nine, it would be best for community-owned Ugandan hunting and tourism companies to operate, as opposed to foreign companies and/or initially in joint venture with foreign operators, until they can provide the services required by overseas tourists.

11.7.4 Foreign Assistance and Debt

U.S. foreign-policy critic Noam Chomsky says the people who actually received the loans should repay the debt - the U.S. imposed dictators, who siphoned off billions to their private bank accounts. Uganda incurred most of its debt during dictator Idi Amin's repressive regime. If the U.S. disapproved, would the World Bank have given him those loans? Meanwhile, the people have been forced to pay them back, thus continuing the repression Amin started (Jensen, 2002) (see Chapter 12, Section 12.5, DEBT AND STRUCTURAL ADJUSTMENT POLICIES).

11.7.5 Foreign Assistance and Structural Adjustment

Foreign Aid is integrally linked to Structural Adjustment (SAP). Structural Adjustment consists of prescribed government fiscal and economic reforms, which are required as a prerequisite to foreign aid (see Chapter 12, SUBSIDIES, FREE-TRADE, STRUCTURAL ADJUSTMENT AND DEBT RELIEF IN SUB-SAHARAN AFRICA IMPACTS ON RESOURCE EXPLOITATION). Both foreign assistance and structural adjustment tend to involve government-to-government grants and loans.

11.7.6 Foreign Assistance and African Governments, the Major Employers in Post-colonial Africa

The role of governments is not to create an economy and to employ the majority of the people. This is the role of the private sector. Until the late 1980s, Sub-Saharan African governments were the largest employers of educated people. By the late 1980s, there were more educated people than governments could employ. Structural adjustment (SAP), and rightfully so, forced many of these bloated inefficient bureaucracies to downsize (see Chapter 12, Section 12.3.4.1, Downsizing Governments). People were laid off or given early retirement packages. Unfortunately, the formal private sector was too limited to absorb the laid off bureaucrats or the young people coming into the work force. Foreign assistance and foreign aid/ODA, as a component of foreign assistance, have not improved on the situation. Today, over much of Sub-Saharan Africa, the only thing that a high school or university graduate is guaranteed is unemployment. Wherever possible, the educated youth of Africa, who should be the backbone of its future, are flocking to opportunities in the developed world (see Section 11.13.1.2, What kind of education?).

The role of governments should be to create an enabling environment in which the private sector can help generate wealth and employ people.

Rather than stimulate employment through the private sector as a basis of driving African economies, the “aid industry”, in many African countries, has become the second-largest employer after the public sector. This has spawned thousands of non-entrepreneurial NGOs (Sogge, 2002a) feeding at the international donor trough, who contribute nothing to a country’s economy except to spend taxpayers’ money from the West, handed to them through the donor – another form of international welfare. NGOs would disappear without a trace if the donors pulled

the “aid plug” (Sogge, 2002a). In most cases, they are another layer of bureaucracy between rural communities and the independence of managing their natural resources.

11.7.7 Government Corruption and Foreign Assistance

In many cases, high-level government officials live off of foreign assistance, which they misappropriate. The last thing many ministers want is for development to succeed and then for donor funds, on which they live, to dry up. This could also be argued with NGOs. Any

“leverage (from foreign assistance) is undercut, however, when donors fail to hold recipients to their promises of economic and political reform. This past June, for example, African leaders met with UN Secretary-General Kofi Annan to make a pitch for more aid, with the promise of better governance in exchange. But before rushing to provide more assistance, donors would do well to recall that no African government has ever been disciplined by its neighbors for corruption and incompetence” (Bandow, 2002).

A fine example between 2003-2008, is Zimbabwe, which the African Union refuses to condemn or sanction despite human rights atrocities, destruction of a vibrant economy and a former breadbasket of southern Africa being turned into a major food aid recipient by President Robert Mugabe and the ruling party, ZANU-PF. South Africa, on behalf of SADC, used an ineffective “quiet diplomacy” (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife).

Foreign assistance has also been used by the West to buy friends and influence, another form of corruption, which one could argue is a form of “high class prostitution” that often has disastrous impacts on the environment (e.g., subsidizing bananas on the Windward Islands in the Caribbean - see Chapter 8,

Section 8.8.4, Sedimentation Associated With Banana Production, Lessons for Africa; Section 8.9, IMPACTS OF PESTICIDES AND FERTILIZER FROM LAND-BASED POLLUTION ON CARIBBEAN CORAL REEFS, LESSONS FOR AFRICA and Section 11.7.7.1, Lomé Convention and subsidized beef in Botswana). Also see Chapter 12, Section 12.8, CORRUPTION AND FAILURE OF IMF/WORLD BANK PROGRAMS.

11.7.7.1 Lomé Convention and subsidized beef in Botswana

The development of the livestock industry in Botswana dates back to the 1950s, with the development of livestock ranches and the Lobatse abattoir by the Colonial Development Corporation, as well as investment of remittances in livestock sent from Tswana working in South Africa. Until the discovery in the 1970s of diamonds, the cattle industry was Botswana's chief source of income. It continues to be a major source of income for Botswana's rural population and a major source of foreign exchange (Cullis & Watson, 2005).

For more than three decades, Botswana's beef has enjoyed an effective subsidy via privileged access to European markets under the Lomé Convention, also known as the Beef Protocol agreement. The former colonial powers - mainly Britain, France and Belgium - wanted to secure their relationship with the newly independent countries. At the same time, they wanted to ensure that trade between those countries and the EU continued in existing patterns. France had already signed an aid agreement with its African colonies in 1957 in Yaoundé, Cameroon. When the Lomé Convention (Togo) was first signed in 1975, the agreement was revolutionary in linking aid with trade concessions. It was the time of radical developing country initiatives on trade, with talk of a new international economic order and commodity agreements to raise the prices of raw materials. The EU offered preferential access for most of the raw materials and many manufactured

goods from its former colonies, as well as billions of euros in aid.³⁶⁹ The aid program included two stabilization funds, one for agricultural exports and another (set up later) for mineral exports (BBC, 2000). It was also linked into the politics of the Cold War, a way of buying allegiance to the West from the political elite in return for having minimal ties with the Eastern Bloc. Europe obtained the added value of transformation of Sub-Saharan Africa's raw products stimulating its economies, while SSA received a pittance in foreign aid, most of which went back to Europe, as discussed. Europe prospered as a continent, while a few political elite among the African's fared well at the expenses of the masses. This can be considered a form of two-way corruption.

Interestingly enough, while structural adjustment policies (SAPs) (see Chapter 12) discourage agricultural subsidies by Sub-Saharan African countries to their citizens, when it suits the political agenda of the West they will provide SSA and other developing regions (e.g., subsidized bananas in the Caribbean) with subsidies at the expense of its natural systems and wildlife. Botswana, because of the Lomé Convention, receives subsidized prices for its beef from the European Community at about 60% above the world market price. Perkins (1996) places the market subsidy on cattle by the EU at 90%. Cullis and Watson (2005) speak of government subsidies covering up to 50% of production costs that include, in addition to EU subsidies:

- “Veterinary Services: veterinary drugs and vaccinations are largely free, and paid out of general tax revenue.
- Subsidies: bull subsidies, artificial insemination subsidies and borehole-drilling subsidies.
- Indirect Subsidies: interest subsidized loans from the National Development Bank; tax advantages for livestock owners (losses may be written off against profits elsewhere).
- Land Rents: ‘artificially low’ TGLP (Tribal Grazing and Land Policy of 1975) ranch rents.

³⁶⁹ The EU and euros did not exist at that time.

- Dual Grazing: the continuation of dual grazing rights allowing ranchers to move their livestock onto communal lands”.

Beneficiaries are primarily Botswana's political elite (Rosenblum & Williamson, 1990; SCI African Chapter, 1996) who buy inexpensive beef from rural herders and sell to the EU at a profit. According to Perkins (1996), 45% of rural families in Botswana own no cattle, while 7% own half the national herd. Cullis and Watson (2005) place 50% of households without cattle as far back as 1974. This 7% tends to be a wealthy salaried urban elite that have the connections and funds to drill boreholes, thereby taking ownership of the area. It is claimed that back in 1986, one South African with vast holdings in Botswana, exported 33% of the cattle quota of 19,000 tons/year to Europe (Rosenblum & Williamson, 1990). By 1991, 74% of families had no cattle (Cullis & Watson, 2005). These poorer households dropped out of agriculture working as itinerant laborers for subsistence wages. By 1981, 29% of rural households were no longer involved in agriculture, this figure rising to 42% by 1991. Thus, benefits from privatization of the commons have concentrated in the hands of a small number of elite, consisting largely of members or supporters of the ruling party. Economies of scale help these elite with large herds (whose number is decreasing) to maximize benefits from the commercialization of beef production on the rangelands (Cullis & Watson, 2005).

Botswana has about 5,000 major cattle ranchers, many of them government officials. The country has a population of 1.5 million, but also one of the world's greatest disparities between rich and poor. This would amount to 0.33% of the population as major cattle ranchers. According to the United Nations, the income of the wealthiest 20% of Botswana's population is 24 times that of the poorest 20%, a ratio exceeded only by Brazil. While most of Botswana's export earnings come from diamonds, copper and nickel mining, cattle ranching provides a huge return on investment, as much as US\$ 100 million/year or 2% of annual national

export earnings. A study by the International Labor Organization (ILO) noted that the return on investment in cattle was 2 to 1 in a non-drought year, but as much as 50 to 1 in a drought year (TED, 1992).

There are on the average two herd owners/borehole with herd sizes of 500 head or more/borehole. Livestock ownership by herders, employed by the urban elite who might visit the cattle post once a year, is negligible, amounting to a few goats and donkeys. The livestock industry employs 30-40% of Botswana's population. However, the majority live in poverty as herders and cattle post residents at a subsistence level, their payment being in rations (sorghum or mealie meal). These poor, including Bushmen, rely on milk from the cattle and food aid to survive. A few wealthy individuals via agents, purchase livestock from small herders, fatten them, and sell them to the Botswana Meat Commission (BMC) at lucrative prices. Strong linkages exist between cattle posts/boreholes, the future of wildlife and the socio-economic situation of Bushmen and cattle post residents. The continual promotion of privatization and commercialization by the EU and World Bank is impacting the future of both Remote Area Dwellers (RADs) and wildlife (Perkins, 1996) (see Chapter 3, Section 3.4.2.3, The legal exclusion of the African hunter from his wildlife - Loss of Hunting and Territorial Rights by "San" Bushmen, Botswana).

In order to assure beef destined for export to Europe is foot and mouth disease free, cordone veterinary fences are required that keep out wildlife (SCI African Chapter, 1996). According to Rosenblum and Williamson (1987), the World Bank has funded at least three of these cattle projects, which ecologist feared would devastate more rangeland and kill off wildlife in large numbers. Two of the projects in the 1970s, costing more than US\$ 10 million, to raise more cattle in western Botswana were declared failures in evaluations by the International Livestock Center for Africa (ILCA). Even though the ILCA advised the World

Bank to get out of livestock in Botswana they funded the third project at a cost of US\$ 17 million in 1986, while Botswana was importing 90% of its grain to feed its population of one million people. Beef was not food, but power, status and wealth. Food aid was free, a budgetary subsidy.

Botswana's national cattle herd has grown from a few hundred thousand cattle in 1950 to close to three million today. Beef exports to Europe are worth more than \$100 million a year to Botswana (Rosenblum & Williamson, 1990; TED, 1992).

In 1986 alone, it is estimated that the EU bought 750,000 pounds of surplus beef, (e.g., from Botswana, Namibia and Zimbabwe) worth US\$ 2 billion that was rotting in storage. This beef was then sold by the EU, at 33% of the price paid to Botswana, to Russia and then the EU turned around and bought beef to send from Europe to next door Angola (Rosenblum & Williamson, 1990).

When drought hit the country in the early 1990s, the Botswana Meat Commission (BMC), which fixes prices for beef, paid high prices to provide short-term gains for livestock sellers, providing a direct incentive to increase stocking rates. BMC has also set the lowest prices at the onset of the dry season, thereby providing a disincentive to farmers to sell off excess stock during periods when the range is under highest ecological stress. Livestock owners are provided with essential services at low cost, including veterinary services, veterinary cordon fences, development of boreholes to provide water to cattle, improvements to trek routes and low land rents on tribal lands, making them attractive to cattle grazing. The short-term gains to relatively few ranchers in Botswana has sent significant amounts of beef to Europe at the cost of the long-term productivity of the biological resources in Botswana's arid lands (McNeely, 1988).

In the Okavango Delta, movements of wildlife to and from the Okavango region are now restricted on the west and south by the buffalo “veterinary” fence to assure foot and mouth disease free cattle for export to Europe. The buffalo fence, Kuke fence, human settlement and the accompanying expansion of livestock restrict north-south movements of wildlife in Ngamiland and Chobe. With the exception of elephants ($1/\text{km}^2$ density), wildlife populations are becoming increasingly restricted to parks and protected areas as human/livestock densities proliferate. The parks and protected areas alone, cannot maintain this resource in its present abundance. Declines of key indicator species have occurred over the past decade in the Northwestern System (SCI African Chapter, 1996) (Table 11.7):

Table 11.7: Change in indicator species populations, Okavango Delta

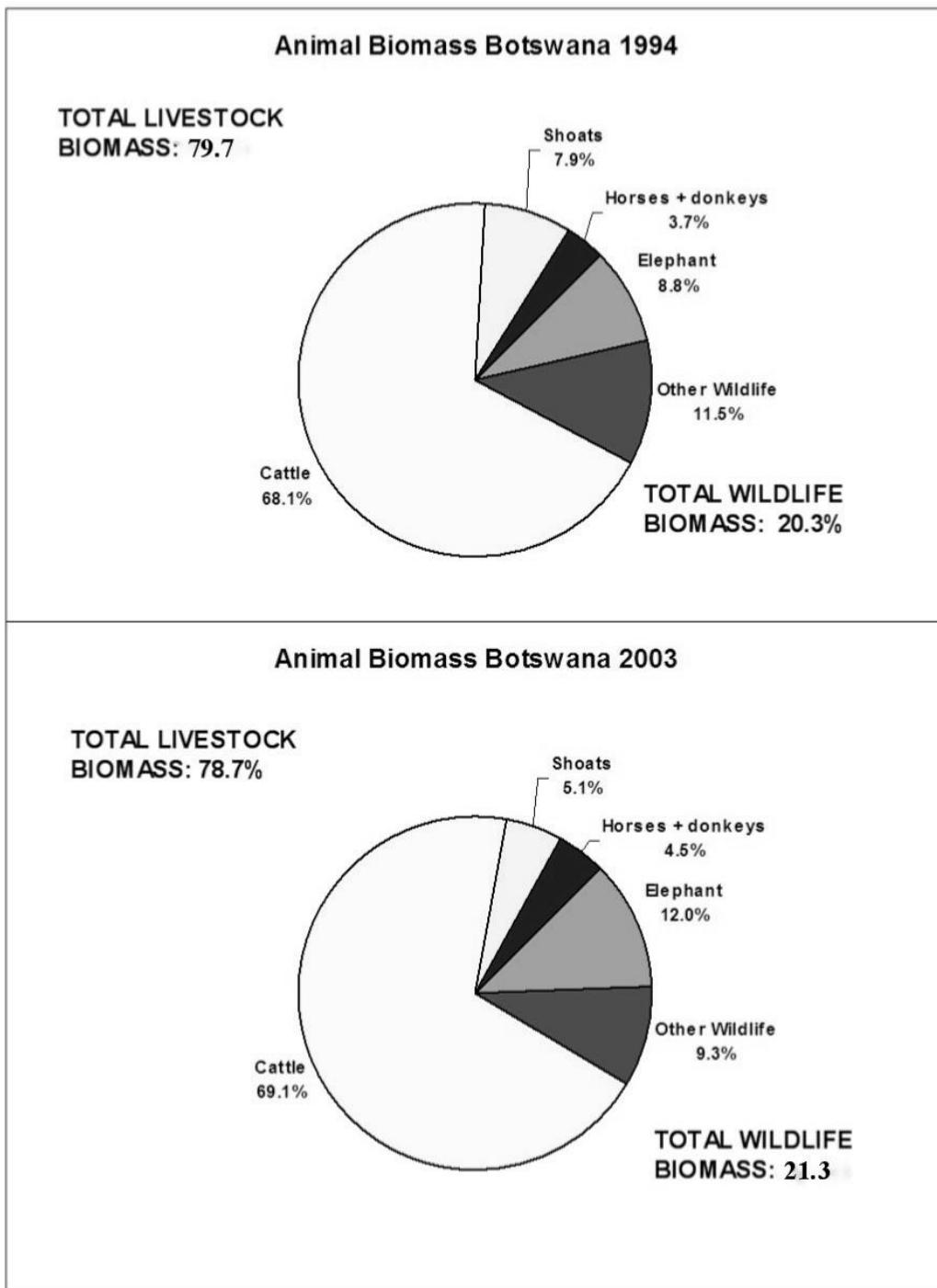
SPECIES	YEAR 1987	YEAR 1994	% CHANGE
-	45,449	78,304	+72
Elephant	72,290	29,037	-60
Buffalo	64,808	46,787	-28
Zebra			

Extracted from: Crowe (1995) with permission of Kalahari Conservation Society (KCS).

Other animals on the decline are roan antelope, sable, waterbuck and tsessebe. Lechwe populations are on an increase. These declines are attributable to the shifting ratio of elephant versus other mammalian biomass, declining floods in the Okavango Delta (major declines in flooding 1994, 95, 96), uncontrolled citizen hunting and inaccessibility to traditional ranges from veterinary fences. Concern exists that the continued increase in biomass of the elephant will be at the expense of other wildlife, their habitat and thus, biodiversity. In 1991, it was estimated that elephant made up 51% of the total wildlife biomass in Chobe and Ngamiland Districts, which increased to 60% by 1994, resulting in a negative impact on biodiversity (Crowe, 1995). Increased elephant populations are resulting in

increased human conflict. Some people say that if the biomass of animals for Botswana as a whole is compared, there has been no change, except that livestock (and it could be argued elephant) is rapidly replacing wildlife as the dominant animal in this biomass (Figure 11.1) (SCI African Chapter, 1996); 79.7% of the biomass being from livestock versus 20.3% for wildlife country-wide in 1994 with little change in 2003, 78.7% versus 21.3% respectively (BWNP, 1994; 2003). Similarly, Cumming (2005) concludes that for southern Africa as a whole, wildlife makes up only 10% of the large herbivore biomass today.

Thomson (2003) believes that any negative trends in lion populations, where elephant numbers have significantly out-competed lion prey species such as buffalo and zebra, are attributed to this competition as opposed to adverse impacts from the limited offtake of trophy hunting (see Chapter 9, Section 9.6.3.4, Botswana Community Trust Program). There are many more lions overflowing the saturated Okavango Delta into livestock areas that are killed as problem animals, than taken by trophy hunters (see Chapter 9, Section 9.6.3.4, Botswana Community Trust Program). The animal rights use misinformation and propaganda to blame any declines on sustainable use, especially sport-hunters, and not their own Western-urban preservationist policies that are being imposed on Sub-Saharan Africa, with little or no understanding of the ecological or economic consequences of their antiquated foreign policies. In this case, the outdated Cold War policy of the Lomé Convention should be reconsidered.



Source: BWNP (1994; 2003) with permission, Botswana Wildlife & National Parks

Figure 11.1: Animal biomass, Botswana, 1994 & 2003, distribution heavily influenced by the Lomé Convention

In southwestern Botswana, there has been a major decline in wildlife populations in this system over a 15 year period (Table 11.8):

Table 11.8: Change in indicator species populations, Southwestern Botswana

SPECIES	YEAR	% CHANGE
-	1979 (a)	-
Wildebeest	260,000	-94
Hartebeest	270,000	-83
Eland	24,767	-48

(a) Kgalagadi and Ghanzi Districts alone ≈ southwestern system

(b) Entire southwestern system of Botswana

Extracted from: Crowe (1995) with permission of KCS.

Boggs (2000) shows a major decline in wildlife between 1978 and 1994 in Southwestern Botswana, but possibly for a more limited area, the Southern Kalahari System (Table 11.9).

Gemsbok, springbok, eland and, to a lesser degree, wildebeest, normally able to live from water in their food, are water dependent during drought periods (Owen-Smith, 1996). Owen-Smith (1996) estimated in the Kalahari region of south-central Botswana, population declines during the drought of 1979-1986 amounted to 90% for wildebeest, 70% for hartebeest, 50% for kudu and over 30% for gemsbok and springbok due to migration blockages from cordone veterinary fences that cut these animals off from accessing water. These fences were required from the 60% subsidization of beef by the Lomé Convention to assure foot and mouth free beef from Botswana into Europe.

SPECIES	Kalahari System		Known Distribution	
	1978	1994	1978	1994
Zebra	100,000	20,863	Numerous & Widespread	Decimated but Widespread
Hartebeest	293,462	44,737	Numerous & Widespread	Decimated but Widespread
Wildebeest	315,058	17,934	Numerous & Widespread	Decimated but widespread
Springbok	101,408	67,777	Widespread But Clumped	Widespread & Concentrated
Kudu	6,429	7,849		
Ostrich	92,286	27,744	Widespread	Widespread

Source: DHV (1980 *In:* Boggs, 2000); DWNP (1994a; 1994b *In:* Boggs, 2000).
Reproduced with permission of IIED, www.iied.org.

Migration corridors may be needed if these declines are to be reversed. In both cases, Western donors have given an artificial comparative advantage to livestock over wildlife (SCI African Chapter, 1996). What will happen when these subsidies end? Rosenblum and Williamson (1987) also blame a De Beers/Botswana “Debswana” consortium for pumping Lake Xau dry in 1983 to wash diamonds, pumping water to a narrower and deeper Mopipi Reservoir. This resulted in a major dieoff of wildebeest from thirst.

Cullis and Watson (2005) relate the decline in Botswana’s wildlife over the past 30 years to the following, in addition to veterinary fences:

- Fencing of commercial ranches, limiting wildlife movement, especially critical during drought.

- Direct displacement of wildlife by livestock as their numbers increase, including disease.
- Boreholes allowing expansion of livestock into areas previously only available to wildlife.
- Human population increases, including poaching.
- Mineral exploration.

“As a result of these and other factors, wildlife is increasingly restricted to protected areas, which are not sufficient (in size or nutritional value) to support the current numbers of wildlife without seasonal movement. It is probable therefore that wildlife numbers will decrease further in the future” (Jones, 1999 *In: Cullis & Watson, 2005*).

As a result, the protein that hunting of Kalahari wildlife supplied to hunter-gatherers and other rural communities has now disappeared. It appears to have struck nobody in the outside world that declaring concern for the Basarwa (Bushmen of the Central Kalahari Game Reserve (CKGR), while preserving Botswana's Beef Protocol agreement with the European Union (EU), smacks of hypocrisy (Perkins, 2002).

11.7.7.2 Mismanagement, corruption and classified forests, Senegal

See Chapter 5, Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal Linked to Charcoal Making, Over-Population and Declining Fallow Periods.

11.7.8 Foreign Assistance for Agriculture in The Sahel

The Sahel provides a good case study of just what is wrong with much Western aid. The Sahel Development Program is a massive scheme supported by billions of dollars from the UN Food and Agricultural Organization (FAO) and countries like France, Holland, Belgium and the U.S. Its purpose is to 'rid the Sahel of food shortages and ecological deterioration, to overcome dependency and to raise the incomes and quality of life for 26 million people.' To do this, the project has created a series of large-scale food production schemes over eight countries, producing everything from rice (for urban areas) to beef cattle (for export). Only 16% of the billions of dollars of aid went to rain-fed crops that the poor peasants and nomads of the Sahel depend on to survive. Most of the farming schemes involved large-scale irrigation and mechanized agriculture run by state parastatals that excluded peasants. Little attention was paid to increase badly needed storage facilities or to ensure a fair distribution of the newly grown food. Many of these large scale irrigation schemes have failed, while wiping out traditional production systems and making rural people poorer and worse off nutritionally, to some degree benefiting political elites of the host countries, aid bureaucrats, construction companies and consulting firms (see Chapter 5, Sections 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture and 5.12.1.3, Irrigation potential, and Chapter 7, IMPACTS OF DAMS ON CONSERVATION AND DEVELOPMENT IN SUB-SAHARAN AFRICA). The Sahel Development Program, like much of the aid going to Sub-Saharan Africa, reflects more the ideas and interests of the donors than the needs of Africa's poor (Elwood, 1984).

11.7.9 Foreign Assistance, Programmed for Failure

C. Payne Lucas (1981), an African American and former president (retired) of AFRICARE, a development NGO, had this to say about foreign aid/ODA:

“...our U.S. Agency for International Development (USAID) program officers frequently are asked to design multimillion-dollar programs with the benefit of little or no reliable baseline data on economic, educational or health conditions in the target country. All too often we recruit a Ph.D. agronomist, for example, from one of our snowbound university campuses, send him almost immediately to his work site and expect him to succeed in increasing agricultural production in a semi-arid developing country -- one with no farm-to-market roads, inadequate sources of energy and a bureaucracy whose leadership changes hands every 6 months. Frequently such technical assistance is further short-circuited because the American adviser has been taught nothing of the culture or language of the people he has been sent to help. He has been programmed for failure, at a cost to the U.S. taxpayer of nearly \$175,000 each year”.

Chabal and Daloz (1999) come to similar conclusions, that within the context of the Cold War following independence of Sub-Saharan African countries in the 1960s, development theory resulted in the mechanical transposition of concepts fashioned in Western/Eastern settings so that during “at least 2 decades, so-called experts merely transferred their blueprints to an environment whose historical, social and cultural specificities they hardly knew, or even cared to discover”. As this book also demonstrates, they had little understanding of ecological constraints, traditional management systems, nor African ties to their land and natural resources. In fact, often African’s technical knowledge surpasses the so-called experts brought in to advise them (Martin & O’Meara, 1995), since these “experts” understand temperate ecology and Western cultures and try to apply these same principles to Sub-Saharan African ecology and African cultures, often resulting in unmitigated failures.

The most important form of government “assistance” is the least justified: economic or development aid.

Such programs were instituted 40 years ago when people believed the Third World was poor because it lacked money. Today we know that is not true. The result has been an expensive wasteland, strewn with spectacular failures. For instance, Zaire (the Democratic Republic of Congo) received some \$8.5 billion from a multitude of sources between 1970 and 1994, but imploded around 1998 (see Chapter 13, Section 13.10.3, Congo-Kinshasa DRC, Sub-Saharan Africa’s world resource war). Former USAID Administrator J. Brian Atwood acknowledged that the investment of over \$2 billion of American foreign aid in Zaire served no purpose. Yet in 1996, UN Ambassador Bill Richardson made a pilgrimage to the Democratic Republic of Congo, promising to provide \$50 million in aid to the new dictator, Laurent Kabil, despite his authoritarian tendencies and the atrocities committed by his military. Virtually every nation in crisis, from Somalia to Liberia to Haiti to Burundi, has received billions of dollars from the West (Bandow, 2002).

In May 2002, U.S. Treasury Secretary Paul O’Neill (former CEO of Alcoa Aluminum) asked on a visit to Sub-Saharan Africa (Editor, 2002),

‘There has been a trillion dollars spent over the last 50 years. At least for me, I have to say, I don’t understand why one of life’s most important conditions, namely clean water hasn’t been resolved. Last year the World Bank spent \$US 300 million in Uganda. What was so important that there wasn’t \$US 25 million to \$US 30 million to give everyone in Uganda clean water.’ Throughout the developing world, waterborne diseases kill an estimated 1.5 million people annually most of whom are children under the age of 5. He considered defeatist the United Nations goal of reducing global poverty by 50% by 2015 (see Chapter 13, Section 13.12.3, Role of private sector versus foreign aid in

economic development), ‘That’s my aggravation, frankly, with the developing community. It’s always tomorrow. For people alive today, their tomorrows are going down every day. How many millions of children are you going to lose between the ages of 0 and 5 between now and 2015 because we don’t do water?’

This editorial goes on to call such development gaps, “arguably the greatest tragedy of the new millennium” (Editor, 2002). Soon after, politics forced Mr. O’Neill to resign. Maybe he was too honest and frank. In Sub-Saharan Africa today, almost 50% of the population lacks access to safe water and adequate sanitation services (Colgan, 2002).

“Perhaps even more staggering is the failure to discern any positive relationship between aid levels and economic growth. Foreign aid actually discourages reform by cushioning the price of policy failure and reducing the urgency of making politically painful changes” (Bandow, 2002).

The United Nations Development Program reported in 1996 that 70 developing countries were poorer then, than they were in 1980; 43 were poorer than they were in 1970. USAID itself acknowledged in a 1989 report that

“‘only a handful of countries that started receiving U.S. assistance in the 1950s and 1960s have ever graduated from dependent status.’ Yet 13 years later, the ideological commitment to state-led development planning funded by the West is alive and well, and the international affairs establishment has continued to push for more money” (Bandow, 2002).

The chapters on boreholes (Chapter 6), dams (Chapter 7) and coastal development (Chapter 8) discussed Westerners misusing northern climate technologies; many by “experts” sent over by foreign aid/assistance to solve the Third World’s problems, but with little or no understanding of ecological constraints, or knowing, but not caring, since they did not have to suffer the consequences of development failures. The following are a few examples of development follies funded by Western donors.

11.7.9.1 Bintang Bolon, the Gambia – Nordic economist knows best

The Bintang Bolon lies about an hour east and upriver of Banjul, the capital of the Gambia, on the South Bank of the Gambia River. In the early 1980s, the US Government hired a team of “American Experts”, the principal author being one of them, to advise the Gambia River Basin Development Organization/*Organisation pour la Mise en Valeur du Fleuve Gambie* (OMVG) on environmental, social, health and economic aspects of developing the river basin. One of the first issues was that the mangroves of the Gambia were supposedly dieing. If in fact this was widespread, which it wasn’t, it would have helped support the argument for building the Balingho Anti-Salinity, which was projected to destroy most of the mangroves. The supposed disease was believed to be indicated by a boll – or knob on the tree. The greatest concentration of dead trees was along the Bintang Bolon in the Gambia. The natural resource economist,³⁷⁰ a Norwegian who had come to the USA on a ski scholarship, suggested clear-cutting the Gambia’s mangroves and replanting them with salt tolerant trees. The absurdity of this is beyond belief. This “expert” had no idea of the role of mangroves in the detrital food chain that fed the rich fisheries of the Gambia and mangrove estuaries around the world. At the end of the day, it was discovered that the major cause for the dead mangroves appeared to be primarily from small farmers, at the headwaters of Bintang Bolon, diking off the bolon in order to farm swamp rice (DeGeorges, 1987).³⁷¹ The modified hydrology affected soil chemistry resulting in hypersaline soils, acidic low pH soils and likely heavy metal pollution (see Chapter 7, Figure 7.13: Interrelated factors

³⁷⁰ Kjell A. Christophersen, CCbenefits, Inc., 121 Sweet Ave., 2368 Arborcrest Rd., Moscow ID 83843, Moscow ID, 83843, Tel: 208-882-4842, Tel: 208-885-5671, Fax: 208-882-2467, Fax: 208-885-3803, e-mail: christophersen@turbonet.com.

³⁷¹ Hubert Forester of GTZ working for the Water Resources Department, Banjul, the Gambia, had seen on aerial photographs what appeared to be diking by small farmers. The author and Gambian fisheries department officials made a survey of the area verifying this to be the case at the village of Boudouk.

resulting in regional regression of mangroves, decreased fish yields and diversity in West Africa) (DeGeorges, 1987) (see Chapter 5 Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture, The Casamance, Senegal Traditional Rice Culture, Versus Modern Interventions).

If there was any disease, and this was never proven, it was due to the physiologically weakened and stressed mangroves in one isolated bolon whose hydrology and soil chemistry were modified by man. The remainder of the mangrove system appeared to exhibit only a natural level of mortality seen in any forest ecosystem. A potential ecological and human tragedy by recommendations emanating from an expatriate Ph.D. resource economist, a so called “expert” was stopped, the clear-cutting of an entire mangrove ecosystem, which extends 209 km (130 miles) upriver from the capital of the Gambia, Banjul/the river mouth.

11.7.9.2 Barrage De Affiniam, Casamance, Senegal; foreign assistance big money, ecological destruction

This is an example of a development project undertaken by foreign technicians without any understanding of how the ecosystem functions in which they were working.

Working with the traditional **Jola (Diola)** rice farmers to construct improved “mini-barrages” of concrete instead of earth, undertaken on a pilot scale in the 1980s, appeared relatively successful and would seem to be the way to go (tidal rice on advanced mangrove soils – see Case Study, Chapter 5, Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture, The Casamance, Senegal Traditional Rice Culture, Versus

Modern Interventions and Chapter 7, Section 7.9.7.3, Hypersalinity, the evolution of mangroves in West Africa and its effects on fish stocks – case studies of the Casamance and Sine Saloum Estuaries).

The other extreme was the Barrage de Affiniam, a large dam that inundated many hectares in an area of the Casamance where the estuary was hypersaline, in the vicinity of 44 parts per thousands (the sea is 35 ppt.³⁷²) (see Chapter 7, Section 7.8.7.3, Hypersalinity, the evolution of mangroves in West Africa and its effects on fish stocks – case studies of the Casamance and Siné Saloum Estuaries). The dam was built by the Chinese. How they ever expected to drain the inundation zone of hypersaline water and replace it with freshwater, is beyond imagination. When the head of the Chinese team was asked by a multi-disciplinary team, of which the principal author was a member, how he planned to successfully operate the barrage, his reply was, “I build dams. It is up to someone else to make them work”. To the principal author’s knowledge, this dam has never irrigated or grown rice and is another relic of Cold War politics, as well as an experimental ground in development failures. All the money went back to China and donor money that could have been used for development was wasted; good business for the Chinese, and an ecological and development disaster for Senegal.

A recent description of development needs by the Senegalese Ministry of Economy and Finance (Republic of Senegal, 2003) admits the failure of the “state” led development of the Barrage de Affiniam. The Senegalese Ministry of Economy and Finance (Republic of Senegal, 2003) and the National Advisory of Planning and Rural Cooperation (CNCR, 1999) both suggest rehabilitating this barrage. Is this possible?

11.7.9.3 The white mountain of Turkana

³⁷² ppt. = Parts Per Thousand

Lake Turkana of Northern Kenya is surrounded by desolate, volcanic mountains. The 274 km (170 mile) long lake has no outlet, becoming increasingly saline. It was formerly known as Lake Rudolf. Living around this lake are the Turkana of northwest Kenya, a herding people of Nilotc decent. They are continuously at war over livestock with the Pokot of Kenya and Karamojong of neighboring Uganda. Various studies by the UN Food and Agricultural Organization (FAO) and the British concluded that the range was being over-grazed by livestock of the approximately 220,000 Turkana herdsmen (Rosenblum & Williamson, 1990; Harden, 1991), and that the solution was to wean them off their milk diet onto another source of protein. Someone came up with the bright idea that converting them into fishermen on Lake Turkana would be the solution (Harden, 1991). The Italian Government built the "Fish Farm" at Kalakol on Lake Turkana (Powys, 2002) and the 1970 Norwegian government built the cold-storage fish factory (Harden, 1991) at a cost of US\$ 2 million (Rosenblum & Williamson, 1990) to help the development of the Turkana Fishermen's Cooperative (TFCS). The cold storage facility never processed a single fillet. "It stands there beautifully intact as a memorial to misguided aid" (Powys, 2002). The Norwegian's also built a US\$ 20 million dollar highway to take the "frozen" tilapia and Nile perch to major urban markets (Harden, 1991). The cost of bringing the 100° F (37.8° C) ambient temperatures to below freezing, cost more than the fillet's were worth and production demanded more clean water than the Turkana District had to offer (Harden, 1991). The state-of-the-art fish processing freezer and cold storage plant was constructed on a hillside not far from the lake. The nomadic Turkana, who despise fish, ended up using the boats as temporary huts (Salopek, 2001). The fish processing plant "stands there beautifully intact as a memorial to misguided aid".

Now, the plant is used to store dried fish (Rosenblum & Williamson, 1990; Harden, 1991; Maykuth, 2000) by a local fishing cooperative that is on the verge

of collapse after a US\$ 2 million Japanese government project to provide better equipment and access to markets pulled out because of insecurity in the area. Roderick Kundu, the Kenyan district fisheries officer in Kalokol, said the problem with the aid projects was that they did not turn the Turkana into commercial fishermen. Likewise, the Italian-built fish farm in Kalokol is empty and protected by guards until it can be sold. It collapsed after the Kenyan government took over the enterprise. Fishermen are now exploiting only 20% (one-fifth) of the lake's sustainable yield. The lake could feed half the population of Turkana (Maykuth, 2000).

Key factors that resulted in the failure of this plant to ever process even one fish are: 1) The donor failed to assess socio-cultural constraints, the Turkana having been herders for hundreds of years with no interest in fishing, 2) Turkana who fished were looked down upon as people who were incapable of maintaining livestock, 3) Like with many herders, fish were not and would never be a part of their diet unless faced with severe drought and 4) There was a major drought and the lake receded about 10 km from the lake edge. The factory closed down in 1986 when Ferguson's Gulf dried up – fed by the Omo River from Ethiopia. It is believed a small percentage of the poorest Turkana have tried fishing. About 20,000 Turkana herded to the lake by the donors lost their cattle from overgrazing and disease during the drought, there were no fish to catch and so they became welfare beggars on food aid (Rosenblum & Williamson, 1990).

To this day, the fish processing plants sit on a hillside not far from Lodwar, named the “White Mountain” by the Turkana because of the color of the plant that gleams in the noonday sun as another Western donor failure.

Both FAO and the Norwegian Agency for International Development (NORAD) also tried to turn the Turkana into farmers. About 10,000 Turkana herders had

been turned into farmers at a cost of US\$ 25,000/farmer so that he could earn US\$ 100/year, 25% of Kenya's per capita income (Rosenblum & Williamson, 1987).

Following the El Nino rains in the Ethiopian Highlands in the last two years, the Ferguson's Gulf - a protected cove to the Northwest of the lake - has again filled up and fish catches have suddenly increased, making the lake the main source of fish in the country. The World Bank, through the Arid Lands Management Project (ARLMP) community development program, has already donated 48 fishing boats and more than 400 fishing nets and hooks. The local fishermen are already receiving training on net making and repair. The fishermen appear to be mostly Luo from western Kenya, along Lake Victoria. Whichever way one looks at the current fish boom, it is likely to generate much controversy and debate, and it will be interesting to see how the local people utilize the resource before the lake does its next disappearing act (Kamu, 1999). Now plans are to revive the failed fish plant (The Nation, 2003). Let us hope there are lessons to be learned.

11.7.9.4 Rube Goldberg and salt production in Uganda

Katwe Salt Works dates back centuries. Katwe Salt Works was managed by the Bagabo clan, which along with nearby Kasenyi Salt Works, supplied western Uganda and Rwanda (Chrétien, 2003). Lake Katwe, a Crater Lake in the Kasese District, is situated in an enclave within modern day Queen Elizabeth National Park in western Uganda. It serves as a legacy to Western donor failure in the development of Africa. The Lakebed is 0.8 m thick and contains over 12 million tons of salt, varying in composition with depth. The lakebed has salt stocks that can sustain an industrial extraction plant with a production rate of seven tons of salt/hour for 34 years (AAITP, 2003).

Traditionally, and as is still the case, salt is produced in naturally occurring brine ponds through evaporating the water, drying and bagging the crystallized salt. It

employs about 2,000 people. Despite being unlicensed from a mining perspective, the artisanal extraction of salt has become legitimized, with the Katwe Local Authority imposing taxes on salt from the works (MSDTA, 2003).

To extract and recover one or more salts from Lake Katwe brine deposits, a German Consulting group (Deutsche Bertungsgesellschaft Fur SalinenTechnik, DBS)³⁷³ concluded in 1970 that it would be economically viable to erect a plant to extract common salt and potassium chloride from Lake Katwe. In 1975, a contract was awarded to Thyssen Rheinstahl Technik GmbH (TRT)³⁷⁴ for the supply and erection of the plant machinery. Roko Construction³⁷⁵ was contracted to carry out the civil works (AAITP, 2003).

When the plant was due for commissioning in 1980, difficulties were experienced because of electricity failures, pipe and equipment blockages and difficulties in blockage cleaning as a result of poor plant layout. There were many design, control and instrumentation problems, resulting in ineffective operation of the salt plant. Insufficient spare parts, failures from poorly installed equipment and corrosion of equipment, apparently from application of an incorrect technology, were the major weaknesses that affected the plant. The plant was finally commissioned in June 1980 with these inherent weaknesses (AAITP, 2003). It is said to have functioned for only a few weeks before the pipes corroded shut.

A number of consulting firms were contracted between 1982 and 1985, concluding that it was technically feasible to extract salt at the plant if the corrosion, salt brine stability and “solubility curve accuracy” problems could be overcome. It was also found out that only very expensive materials could solve

³⁷³ Can not find on internet. May no longer be in existence.

³⁷⁴ German firm, locate name on internet but no address or website.

³⁷⁵ Roko Construction Ltd., International and Multinational Private company, P.O. Box 172, Plot 160, Bombo Rd, Kawempe Zone, Kampala, Uganda, Phone: 256 41 567331, Fax: 256 41 567784 from www.enteruganda.com/business/business_directory_alphabet.php?

the corrosion problems at the plant, hence compromising the economic viability of the plant (AAITP, 2003).

In 1995, the Ugandan Government, through the Uganda Development Corporation (UDC) and with the assistance of the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD), commissioned a feasibility study to assess the viability of rehabilitating the existing plant at Lake Katwe to recover 40,000 tons of salt per annum. The study, by Sabbour Associates,³⁷⁶ in association with Booz Allen UK,³⁷⁷ commenced in 1996 and was completed in 1997 at a cost of European Currency Unit (ECU) 460,000. The findings of the study to rehabilitate the existing thermal extraction plant were (AAITP, 2003):

- Estimated cost of rehabilitating the existing plant is US\$ 20-22 million;
- Annual operating costs would be higher than desired, hence resulting in a marginal project;
- 40,000 tons/year of salt at 95% purity could be produced at the rehabilitated plant, which is below the 97% purity standard set by the Ugandan National Bureau of Standards for edible salt. Salt of 97% purity could be produced with the corresponding losses in amounts produced (28,000 tons/year) after further refining.
- The plant would employ approximately 140 people of varying skills; and
- The rehabilitated plant would have a marginal Internal Rate of Return.

The 1996 evaluation by Sabbour Associates revealed that the existing processing plant assets are in a very poor state of repair. A structural analysis on all existing

³⁷⁶ Sabbour Associates, 20 Lotfi Hassouna Street, Dokki, Cairo, Egypt, Tel: +202 7494964, Fax: +202 7494963, main@sabbour-associates.com, www.sabbour-associates.com

³⁷⁷ Booze Allen Headquarters, 8283 Greensboro Drive, McLean, Virginia 22102, +1 (703) 902-5000. No U.K. address, only a website bringing one to U.S. address, www.bah.co.uk/

buildings concluded that none of the buildings (production and staff housing) have structural defects. The structural analysis also revealed that the buildings are also suitable for other industries such as cotton spinning or warehousing.

In view of the envisaged problems with the existing plant, even after rehabilitation, the consultants carried out a pilot study of an alternative – Combined Cooling and Evaporation Process - that proved the most beneficial in comparison to the existing process after rehabilitation. The critical success factors for the alternative process were (AAITP, 2003):

- Estimated Capital cost would be US\$ 30-35 million;
- Acceptable operating costs resulting in a financially viable project;
- 40,000 tons of salt (NaCl) at >97% purity, which complies with the Uganda Bureau of standards for edible salt, would be produced per year;
- Also, 19,000 tons of Sodium Sulphate and 17,000 tons of Potassium Chloride, valuable by-products, would be produced per year;
- Approximately 140 people of varying skills would be employed;
- A profitable Internal Rate of Return (14%) would be achieved; and
- The additional by-products are raw materials for the production of detergents and fertilizers. This is a potential to promote additional industrial development in Uganda.

The Lake Katwe Salt Project has assets held under a company registered in the names of Lake Katwe Salt Company Ltd. The assets include land, buildings, basic infrastructure on the ground near Lake Katwe and the processing plant (AAITP, 2003).

Currently, there is no operational activity carried out by the project. There is only a residual caretaker staff of 12 employees whose costs are funded by the

Enterprise Development Project and are tasked to ensure the security and maintenance of the assets (AAITP, 2003).

The Kasese district government and the Lake Katwe town government contested the ownership of Lake Katwe (Mobbs, 1999). It would also appear that the 2,000 people employed by traditional production would not like being displaced by a high tech industry employing only 140 people. Is this considered progress on a continent and in a country with high unemployment?

“At present all salt approved for human consumption in Uganda is imported. Most imports originate in Kenya and total over 60,000 tons/year, which is above the 40,000 tons expected to be industrially extracted from Lake Katwe. Salt is generally a low value commodity and therefore uneconomic to transport over long distances. This spells potential for the Lake Katwe produced salt, with regard to the market in the western axis of the country and the neighboring countries thereof, over the Kenyan produced salt” (AAITP, 2003).

Had the salt factory functioned, it would have ruined Lake Munyanyange, which is a natural bird sanctuary and Uganda's only regular site for Avocets (Booth, 2002/10/28). The plant stands today, a Rube Goldberg monstrosity mesh of pipes rising to the height of a four to five story building. Side by side, still producing salt as they have for hundreds of years, are functional salt drying ponds effectively run by local entrepreneurs.

11.7.10 Agricultural Bias of Foreign Aid by USAID

It was not until the late 1980s that foreign aid began looking at natural system management – that is the sustainable use of timber, wildlife, fisheries, etc. (see Chapter 9 on CBNRM). For the first 30 years of its existence, agricultural economists, who had little or no understanding for how ecosystems functioned, dominated USAID. Very often, as discussed in Chapters five and six, the technological fixes in agriculture and range management were inappropriate, given the ecology of Sub-Saharan Africa's natural systems, the lack of training in intensive management of their natural resources and the application of these technologies by rural Africans. Rural Africans knew how to drive a bicycle, but were given a mirage/F-16 fighter plane. They crashed, both in applying these technologies and in sustainably managing an environment over-populated with people and their livestock, with inappropriate land tenure systems exasperating these problems as an outcome of colonialism and the last 40 years of independence. These agricultural economists viewed all of Sub-Saharan Africa's ills as being solved through agriculture. This included tree farming as opposed to natural forest management, fish culture as opposed to natural fishery management and livestock as opposed to wildlife management in savanna areas. In essence, they saw Sub-Saharan Africa as “one vast corn field” with everything planted neatly in a row. Some have called this “integrated rural development”, solving all the development ills of Sub-Saharan Africa on the farm, and it has failed (see Section 11.10.1, Foreign Aid for “Conservation”? and Section 11.10.6.2, “Conservation and development” a continuation of failed “integrated rural development” linked to “preservation”). One of the main reasons for this is that rural Africans traditionally have not only live off their farm produce, but a diverse array of wild products from fallow lands, the bush, forests and savannas. Until about 15 years ago, this was the case for most Western donors. Be sure, that all these donors are controlled by economists/politicians and not ecologists, or there would be drastic differences in how money is spent and the accountability required.

11.8 FOOD AID

Food aid in essence is the dumping of mostly subsidized grains, usually maize, from America or Europe into Sub-Saharan Africa. It is estimated that globally, the United States provides US\$ 1 billion to subsistence farmers or about US\$ 1/farmer in aid (Sachs, 2005). The U.S. also dumps about US\$ 800 million/year in food globally “to feed individuals in crisis, but which does nothing by itself to solve the more fundamental problem of unstable and insufficient food production” (Sachs, 2005). In fact, as will be seen, food dumping actually adversely impacts Sub-Saharan Africa’s ability to feed itself.

11.8.1 Lords of Poverty – Food Aid and Food Dumping in Africa-Detrimental to People and Wildlife

“Relief can be a narcotic. The more that is administered, the greater the dependency. Like a narcotic, it cannot be stopped without grief. Once famine strikes, grain shipments are essential to keep people alive. Yet badly timed relief destroys farming systems and subsidizes the policies that lead to famine” (Rosenblum & Williamson, 1990). “If aid does not support Africans own efforts to produce, it can reduce proud people to beggars” (Rosenblum & Williamson, 1987).

At the July, 2004 African Union summit in Addis Ababa, The Ethiopian Prime Minister Meles Zenawi expressed his concern that food aid breeds dependency, undermining people’s willingness to fend for themselves. His goal is to begin accenting local agricultural production as a means of getting off food aid dependency, a chronic disease in most of Sub-Saharan Africa, by giving peasant farmers access to land and giving them land tenure, transforming small-scale subsistence farming into small-scale commercial farming and developing rural markets (Majtenyi, 2004).

Certainly, it can be argued from a humanitarian point of view that food aid in times of drought helps prevent massive starvation. It can also be argued that from an ecological point of view that food aid - without integration into a balanced public health plan, which includes family planning - allows human populations to grow beyond the carrying capacity of the land to support them. In many cases, as in Somalia and Sudan, major portions of the food aid, with full knowledge of the donor bodies, are diverted to strengthen and allow armies to fight more and better, as no army does well on an empty stomach (see Section, 11.8.6, Food Aid and NGOs in Sudan and Section 11.8.7, Food Aid and War in Somalia). In recent times, food aid has been politicized, as in Zimbabwe (see Chapter 5, Section 5.7.4, Land Reform/Redistribution without Integrating Local Communities as a Constraint to Agricultural Production).

In order to maintain high domestic food prices to the advantage of First World farmers, First World nations usually use one, or both of these techniques (Schoolland, 2002):

1. Prohibit the importation of many agricultural products from the developing countries and/or; and
2. Dump crops abroad under the guise of “foreign aid”.

In some African countries, food dumping has resulted in maize that cost US\$ 74 to produce, selling in the local market for US\$ 21. Once local farmers are put out of business, import prices are often increased, placing the urban poor at the whim of rising world grain prices (Sogge, 2002a).

In the book, “Lords of Poverty”, Hancock (1989) explained how the purpose of international food aid is really to subsidize American and European farmers and is

actually a disincentive to local production. This book was banned in Kenya in the early 1990s. This is reiterated by Bandow (2002), a senior fellow at the Cato Institute and a former special assistant to President Reagan for policy development:

“Food for Peace shipments are more efficient at dispersing domestic agricultural surpluses than feeding starving foreigners. They also have a sad record of ruining indigenous farmers”.

The end result of food aid programs is a complete dependence on food aid for many countries. Food aid destroys Third World food production, creating a perpetual crisis that requires more aid to avoid famine. The cycle continues until the country is completely dependent on free food from abroad. As one analyst put it, foreign aid has become “the opiate of the Third World” that keeps the less developed countries (LDCs) permanently dependent on the West for their very existence (Majewski, 2002) (see Chapter 5, Section 5.6.3.3, Donor subsidized food as a constraint to agricultural production).

The UN Food and Agricultural Organization (FAO) warns that developing countries must become more self-reliant in food production, reversing the policies imposed on them by the Washington Consensus (IMF/World Bank structural adjustment policies [SAPs]) (Chomsky, 1999). This implies that Sub-Saharan African governments must become more active in supporting farmers, possibly subsidizing them to some degree, or setting tariffs and quotas to allow, where possible, some level of internal food security from the West, who is turning them into beggar nations both financially and nutritionally. This implies identifying the 27% of prime agricultural land of Sub-Saharan Africa and managing it on a commercial level as much as possible, to produce food that can feed the nation (see Chapter 5, Section 5.12, THE WAY FORWARD; Chapter 12, Section 12.9.3, Role of Sub-Saharan African Governments in Diversification Through

Industrialization and 13.18.1, Going Local Where Necessary, Development Of Regional Markets).

The impacts of agricultural subsidies on Sub-Saharan Africa will be discussed in some detail in the Chapter 12.

11.8.2 Food Dumping, Malawi

European Union (EU), Common Agricultural Policy (CAP) tariffs and quotas keep Malawi's chief exports of corn and sorghum out of European markets, while at the same time CAP subsidies help European producers crowd out Malawi sales in third-country markets. It is believed that the CAP hurts the continent's ability to attract private investment from overseas, including financial, technological and human capital to drive economic and social development (Hassett & Shapiro, 2003) (see Chapter 12, Section 12.2.4.1, Agricultural tariffs).

11.8.3 Food Dumping, Kenya

Kenya, self-sufficient until the 1980s, now imports 80% of its food, while 80% of its exports are accounted for by agriculture. In 1992, European Union (EU) wheat was sold in Kenya for 39% cheaper than the price paid to European farmers by the EU. In 1993, it was 50% cheaper. Consequently, imports of EU grain rose and in 1995, Kenyan wheat prices collapsed through oversupply, undermining local production and creating poverty (Mittal, 2001 & Shah, 2001).

11.8.3.1 “Food for Peace” or “food for poverty”, Western donor impacts on food production and wildlife management in Laikipia, Kenya

The (American) Food for Peace (FFP) (Public Law, PL-480) program was established in the 1950s to get rid of unwanted farm surpluses, to build new markets for American products and to reward favored Third World regimes. Concerning Food for Peace, in

“The Economist February 2, 1985, ‘This dumping has allowed shortsighted local governments to keep the price of foodstuffs for the urban proletariat so cheap that native farmers are ruined, and dependence on imported foods become a drag on development.’ Farmers in many Third World nations don’t always have the clout that farmers have in developed nations. Many repressive Third World regimes, along with some international bureaucracies and political lobbies, owe their continued existence more to aid programs than to indigenous popular support” (Schoolland, 2002).

In 1990, the principal author, as Regional Environmental Advisor to USAID, was approached by Russell Clark³⁷⁸ who was then head of the London Rhodesia Company (LONHRO)’s agribusiness in Kenya. They had two ranches in the White Highlands of Laikipia. These game ranches were losing money based on tourism and cattle. Game cropping was allowed and there was an over-abundance of game, especially zebra – a bulk feeder, but a limited game meat market in Kenya. International veterinary restrictions prevented the sale of this game meat overseas.

Russell proposed bringing in a solar dryer from Japan, setting up a culling operation covering most of the Laikipia Ranches and establishing a distribution network, supplying a high quality protein source to refugee camps in Somalia, Sudan and Ethiopia. As Russell said, “We can show that Africa can feed Africa”. The USAID PL480 “Food for Peace” Kenya representative said that is very nice, but that we are here to subsidize American farmers, not to help “Africa Feed

³⁷⁸ Later an advisor to the Zambia Wildlife Authority.

Africa". End of story and so much for the idea that USAID was in Sub-Saharan Africa to help it become economically independent and to attain food security. In the case of wildlife in Kenya, wildlife could have been given a new value and could have helped Sub-Saharan Africa stand on its own two feet under a policy of food security, where wildlife as a land use can out produce grains in many low rainfall savannah areas of Kenya, allowing people to generate income to purchase food produced cheaper elsewhere. However, this went against U.S. national and foreign policy. It could have been orchestrated so easily with local currency that comes out of the PL 480 funds from purchasing this cheap food by the host country.

In FY 2002, USAID obligations for SSA totaled \$1.1 billion, of which USAID's assistance consisted of \$420 million for child survival and disease programs, \$466 million for development assistance programs, \$100 million in economic support funds and \$132 million for Public Law PL-480 (USITC, 2003) (see Section 11.7.1.1, Overseas Development Assistance [ODA] versus Overseas Assistance [OA] – U.S. Foreign Assistance).

Noam Chomsky (1999) explains that not only was Food for Peace (FFP) aid used to help subsidize American agribusinesses and shipping, but by undercutting local producers, was also a disincentive to produce some level of food security, the goal being to create dependency. This dependency served the political interests of America during the Cold War and would appear to serve its interests today, possibly as one tool among many of accessing Sub-Saharan Africa's natural resources as cheaply as possible. Interestingly, Chomsky (1999) argues that the use of Food for Peace aid destroyed Columbia, South America's wheat³⁷⁹ industry and was a major cause of small farmers turning to growing cocaine, ironically to service a growing drug culture in America.

³⁷⁹ The author believes this to be maize and not wheat?

11.8.4 Food Aid and Ujama'a Villages in Tanzania

With food aid to "cover-up" the most grievous results of their actions, Third World governments can pursue such counterproductive policies as forced collectivization and price controls on farm products. Tanzania's President Julius Nyerere was able to collectivize farms, "Ujama'a Villages" (translates: "pulling together"), and engage in massive relocations of peasants because food aid "hid" the consequences of such actions (Majewski, 2002). His idea was that African village life was essentially socialistic and by expanding this to a modern state, everyone would approach moderate wealth. Good ancestral land was abandoned in favor of moving peasants into crowded areas, where inputs failed to arrive in a timely manner and similar to the colonial tsetse concentration program under the British – the soils played out, crops did not reach market, abandoned cashew crops failed – the major source of revenue. As discussed in Chapter two, traditional African societies may have a communal structure, but they are made up of separate pockets of capitalism that amass wealth through such activities as crops and livestock, excelling at hunting, fishing, honey collection, in traditional medicine, blacksmithing, logging and charcoal making among others, and where leaders through custom and religion have a responsibility to their extended families. Nyerere's system put unaccountable politicians and bureaucrats in power, not traditional leaders, who interfered with the creation of wealth and made most people poorer. Those who worked supported those that did not, until no one worked (Rosenblum & Williamson, 1990). It is estimated that between 1973-76, about five million people were bullied into these model communal settlements, this concentration policy having already failed under the British [see Chapter 3, Section, 3.8.3, Land Compression and British Colonial Policy, Tanganyika (Tanzania) and Chapter 5, Section, 5.6.1.9, Failure of colonial groundnut scheme in Tanganyika (Tanzania)]. This experiment in socialism was

a failure, both ideologically and ecologically. Although the government, not the donors, took the initiative, the same techno-economic vision was shared until late in the game by the World Bank, USAID and other donors contributing to Tanzania's development (Sogge, 2002a).

11.8.5 EU Dumping of Milk and Meat

In "the semi-arid and sub-humid grazing systems, especially in West Africa, this dumping of meat and milk reduced off-take and increased grazing pressure. The recent devaluation of the CFA franc (from 50 CFA/1 French Franc to 100/1 in 1994) almost doubled off-take from the Sahelian herds, thus reducing grazing pressure, and almost eliminated the imports of dumped meat from the EU" (Vergriette & Rolland, 1994 *In: de Haan, Steinfield & Blackburn, 1997*).

However, devaluation of the CFA has had a devastating impact on wildlife in many countries, people turning to poaching as other segments of the economy collapse (see Section, 11.11.6 Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the "Dobi Dobi", More Parks and Protected Areas).

11.8.6 Food Aid and NGOs in Sudan

In mid-1998, Southern Sudan suffered its fourth major famine in ten years resulting in an estimated 70,000 – 100,000 deaths. Famine in Sudan reflects a long history of politically powerful groups exploiting their superior access to political power, including direct use of force, in order to extract economic benefits from politically weaker groups. The British annexation of South Sudan to North Sudan in 1947 is seen by many as the source of the ongoing turmoil and the underlying cause of recent famines (Deng, 1999 *In: Devereux, 2001 In: Devereux & Maxwell, 2001*).

Food aid has been used as a weapon by both sides (Meredith, 2004). Operation Lifeline Sudan has always recognized the government's authority, a fact that Khartoum often abuses to limit humanitarian response to parts of the country it does not control by vetoing food aid drops to specific towns and territories and introducing strict flight clearance rules. However, Operation Lifeline Sudan also works closely with the rebels in the south, in effect giving them some UN legitimacy. In 1995, the Sudan People's Liberation Army (SPLA) and a splinter rebel faction signed ground rules, brokered by Operation Lifeline Sudan, meant to ensure protection of civilians, accurate delivery of food aid and respect for children's rights. Some argue that by providing relief supplies it allows the warring sides to buy time, re-supply their forces and even maintain legitimacy in territories they control. The government accuses Operation Lifeline Sudan of backing the SPLA. The SPLA has also obstructed aid and attempted to use the delivery of food in the south for its political advantage. The SPLA has also regularly diverted food aid for military use (ICG, 2002). One food aid official admitted that he made deals with Garang, 10% of the food going to Garang and 90% to supposed refugees (Meredith, 2004). Madsen (1999) speculates that USAID, with strong ties to the CIA/Intelligence community, used the old CIA Airline, Southern Air, to funnel both arms and food aid to the SPLA through Western NGOs.

During the principal author's stay in Nairobi with USAID from 1990-1992, an ex-Peace Corps friend, Dale Skoric (*pers. comm.*)³⁸⁰ from Cody Wyoming, worked in Nasir, southern Sudan, on a program coordinated by the World Food Program (WFP). This was the headquarters for Riek Machar, the Nuer SPLA leader (in 2007, Vice President of Southern Sudan), who switched allegiances a couple of times between the SPLA head John Garang (a Dinka) and the Khartoum Government. At the time, he was allied to the SPLA. It was common knowledge

³⁸⁰ In 2006, Food for Peace Officer, USAID, Washington, D.C.

among the food aid fraternity that Riek kept the refugees in camp and that a portion of all food aid went to feeding his army. Dale explained a number of times, that if left to their own means, the Nuer herdsmen could have dispersed into the bush and done quite well on their own. The food aid fraternity knew very well that their support was going to feed an army and that the refugee camp was artificial. However, rather than rock the boat, in order to keep the food and their “lavish lifestyles” in Nairobi flowing and likely to support the geo-political agenda of the U.S./West, the status quo was tolerated (see, Chapter 13, Section, 13.10.1.6, Oil-scorched earth Sudan). Similar use of people by “warlords” as human bait is said to have occurred in Somalia in the 1980s and Eastern Zaire (see Chapter 13, Section, 13.8.6, Former Cold War allies vying for power in the Great Lakes Region) in the 1990s as proof of humanitarian need (Sogge, 2002a).

11.8.7 Food Aid and War in Somalia

In Somalia in 1986, the army and militias took more than 80% of the food aid. Sometimes military and commercial interests coincide, such as in garrison towns in Sudan, Eritrea and Somalia (Devereux, 2001 *In: Devereux & Maxwell, 2001*). Jan Westcott, a USAID food aid employee, and Trevor Walker a British/Kenyan (*pers. comm.*)³⁸¹, both working in Somalia, expressed similar opinions of food aid jokingly saying, “we are feeding the Somalis to fight another day”. More recently, Ostheimer (2000) states,

“by feeding the population (through foreign food aid), resources are freed up for the warring factions”.

11.8.8 Food Aid and Impacts on Grain Production in Southern Africa

³⁸¹ Jan Westcott and Trevor Walker, Food Aid Workers, Living in Kenya and delivering to Somalia, 1990-1992. Ms. Westcott believed to be back in USA and Trevor Walker resides on the Athi Plains, Nairobi. His son Alex was a professional hunter with Miombo Safaris, Tanzania and runs a photographic safari operation in Kenya, “Serian Maasai Mara”, www.serian.net.

A combination of drought, floods and radical land reform in Zimbabwe resulted in an influx of Western food aid in 2002. Food aid is killing commercial businesses in the region. An intentional over-estimation of food aid by the World Food Program (WFP), as a means of attracting food aid, raised maize prices to over R2,000/ton based on supply and demand. In a similar response to the Laikipia case study above,

“In an effort to allow Africa to feed Africa, the World Food Program (WFP) was approached to rather buy processed products from South Africa - which had a surplus at that time - to supply to these countries in despair. Response from the donor community was ‘we don’t give money, we give product’ - surplus product” (de Villiers, 2004).

Because of free food, “food aid” and a stronger Rand, exports of wheat flour and maize meal from South Africa to the region, halved in 2003. So much food aid is going to Lesotho and Swaziland that grain mills must sell their product outside these countries, as the local market is saturated with food aid. Similarly, Zambian farmers have no internal market because of food aid (de Villiers, 2004).

“Food aid in these countries at uncontrollable quantities has a negative impact on both commercial businesses, including feed millers, the milling industry, retail and others, and farmers to such an extent that they are struggling to survive during this time. Food aid internationally is on a downward trend, but the percentage supplied to Sub-Saharan Africa is increasing. According to the International Grains Council in 2000, Sub-Saharan Africa received only 17% of the total food aid supplied, but in 2002 it increased to 35%” (de Villiers, 2004).

The quality of the donated food aid is also questionable.

“The South Africa milling industry experienced difficulty in processing the yellow maize for Lesotho that was donated by the

United States due to very high moisture levels and high screenings. Some of the wheat donated to Zimbabwe contained toxic levels that were up to 15 times higher than that of the South African standard” (de Villiers, 2004).

High moisture levels can set the conditions for carcinogenic aflatoxins “toxic levels” created by mold (see Chapter 5, Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture - Cold War Politics and Western Donor Impacts On Food Production, Senegal).

It also appears that donated food, as the principal author has seen all over Sub-Saharan Africa, is finding its way into retail stores along the trucking route between South Africa and Zimbabwe, in essence food aid competing with the local farmer and local processors (de Villiers, 2004). In the long run, the danger is southern Africa’s farmers and agro-industries could be put out of business and become permanently dependent on food aid from overseas. This is dangerous for a number of reasons: 1) With a population doubling in 50 years and a past history of global grain deficits since 2000,³⁸² can southern/Sub-Saharan African count on the rest of the world feeding it in the long run, 2) global production of ethanol could also result in less grains available for food aid (see Chapter 5, Section 5.3.1.2 Keeping up with future demand – global deficits of the 21st century and Chapter 13, Section 13.7.2, Western Foreign Policy and Multi-Nationals Exploiting Africa), and 3) Once food aid dependent, food aid becomes a political tool to control and manipulate everything from a country’s vote in the UN to pricing raw products in the interest of the importing country – in other words, South Africa begins losing control of its sovereignty, the end game in foreign aid as it slides further into a permanent state of welfare.

³⁸² For the first time in four years, with bumper maize production in the USA and wheat in Europe in 2004/2005 being projected by the FAO, cereal production should meet global demand, offsetting the need to draw down global grains stocks for at least one year (see Chapter 5, Section 5.3.1.2, Keeping up with future demand – global deficits of the 21st century).

J. F. de Villiers of the South Africa National Chamber of Milling, pleads to the international donor community,

“South Africa would like to thank the food aid fraternity for its involvement and supplies to people in distress, but also urgently call on the international community not to deny us the right to produce and develop commercial business and thereby develop our region to become globally competitive” (de Villiers, 2004).

Some U.S.-based charities are heeding this call. Doctor Helene Gayle, the president of the U.S.-based charity CARE has turned down US\$ 45 million in U.S. Government food aid, stating that “it floods local markets with cheap imported crops, which local farmers cannot compete with”. One change some aid groups advocate is to amend U.S. law, allowing them to purchase more locally produced products in recipient countries, instead of importing from the U.S. The ultimate goal is to build sustainable local economies, provide food more efficiently for emergencies, or food for people who are in need (Besheer, 2007).

11.9 THE NEW SAVIORS OF SUB-SAHARAN AFRICA; NGOs

“International conservation planners [now] stress the need to ‘empower’ local people. This form of paternalism seems to be an entrenched feature of Third World development and humanitarian aid projects, which are typically planned and implemented by highly educated middle-class Westerners. The project planners and managers generally maintain (or improve) their own lifestyles, while displaying attitudes that seem to be colored both by colonial-style paternalism toward people they regard as the benighted peasants of the Third World, and by guilt for the perceived wrongdoing of their colonial antecedents. This pursuit of a mixture of material and sociopolitical aims has become endemic in Third World conservation projects initiated by Westerners and, as I have argued, has its roots in the liaison that developed in the 1970s between international conservation and development organizations” (Oates, 1999 *In: Nelson, 2003a*).

In recent times, much foreign aid has been directed through NGOs as the “flavor of the month”. With the waning of the Cold War, there was a reduced need to worry about the takeover of the African subcontinent by communist ideologies. In the 1990s, Western donors began to sour on the progress governments were making in the development arena, even though many of their very own policies imposed on Sub-Saharan African countries (e.g., Structural Adjustment [SAP], supporting despots and corruption by the political elite as long as they kept the communist presence off the subcontinent) affected development performance. They began channeling much of their money through Non-Governmental Organizations (NGOs). Manji and O’Coill (2005) place the emergence of NGOs in Sub-Saharan Africa in the 1990s from Western donors funneling money through them to ensure a so-called safety net of social services taken away by structural adjustment (see Chapter 12, Section 12.3, STRUCTURAL ADJUSTMENT, IMF AND THE WORLD BANK and Section 12.4, STRUCTURAL ADJUSTMENT FOOD PRODUCTION AND LAND/RESOURCE DEGRADATION IN SUB-SAHARAN AFRICA). In 1992, NGOs distributed 10-15% of all aid transfers to developing countries. The U.S. government channels 40% of official funding through NGOs. It is estimated that 75% of aid money is spent on administration (Manji & O’Coill, 2005) (e.g. overhead and salaries of NGOs and consulting firms), implying that only 25% goes to so-called development. Aid and also NGOs can also draw critically needed talent away from governments,

“Aid can also damage the economy through inflation. Higher wages in the NGO sector can cause competent civil servants to leave government to work for foreign agencies or cause others to seek to achieve similar standards of living through corruption” (Transparency International, 2005a).

Most of the NGOs are based out of the West, most often from the country of the donor supplying the development and today, conservation funds. Even local

NGOs are often affiliated with foreign NGOs and/or heavily influenced by the politics and visions of the Western donors providing their funding. Their overheads are often lower than the “Beltway Bandit” consulting firms, but it is simple - both international and local – NGOs and consulting firms, like governments and donors, are not entrepreneurial. They spend money. They do not generate wealth from Africa’s resources, nor do they know how to help rural African’s do the same. Very often they are organized by donor agencies or spring up as entrepreneurial ventures (for the few NGO employees) to meet donor specifications. Very often, grass roots organizations, once member/stakeholder driven, become donor driven as they begin living off donor funds. For citizens and local communities, development choices and initiatives end up in the hands of foreigners or local actors with little or no accountability to public authority, creating a tyranny of structurelessness with little or no coherence (Sogge, 2002a). Thus, northern and even local NGOs proliferated, becoming functional parallel states (Zack-Williams, 2002 *In: Zack-Williams, et al., 2002*) within states. The idea that donor-dependent, ideologically diverse NGOs can stand in for a mass democratic movement is ludicrous (Bond & Manyanya, 2003).

Willsea (2003) refuses to list NGOs that take U.S. government funds, as possible alternatives to the U.S. Peace Corps, since concern exists that these NGOs become intrusive instruments of U.S. foreign policy with continued hegemony over and exploitation of the developing world. This would also be true of NGOs linked to other bilateral and multilateral donors.

The explosion in number of NGOs in the 1990s is not a reflection of a flowering civil society, but evidence of adaptation by Sub-Saharan African political actors to the changing complexion of the international aid agenda. NGOs have become the new structures for Sub-Saharan Africans to establish an instrumentally profitable position within the existing system of neo-paternalism, taking

advantage of the new rules established by the international aid market. Far from strengthening civil society, NGOs are hijacking genuinely needed development aid. NGOs spend an excessive proportion of their budget on furnishing their members with sophisticated and expensive equipment (e.g., 4x4 vehicles, computers, salaries, *per diems*, world travel to conferences and workshops), leaving too little for development. Corruption and neo-patrimonial relations are brought from the central to local level (Chabal & Daloz, 1999) with little or no change in the average person's life. As beneficiaries, rather than asking for an overhaul of foreign aid, these NGOs press for more (Sogge, 2002a). Sankore (2005) sees NGOs as part of the long-term problem, while they purport to provide short-term solutions to economies and development. Child, B. (2004b *In:* Child, B., 2004a) explains that the urbanized political elite that control conservation policies, through conservation NGOs, prefer to spend a disproportionate amount of resources on conferences, which they attend, leading to more conferences.

From the authors' experiences, NGOs often strategically place themselves between the rural communities and their resources, serving as another layer of bureaucracy that impedes rural Sub-Saharan Africans from freely accessing, managing and having the right to reap the benefits from sustainable management of these resources. They make themselves indispensable and often jockey for power over who controls certain countries or geographical areas within a country for donor funding. For instance, the principal author personally witnessed a turf struggle by the World Wildlife Fund (WWF)³⁸³ and the Wildlife Conservation Society (WCS)³⁸⁴ over conservation and associated donor funds in Southeastern Cameroon. WWF won out, while just across the Sangha River, WCS controls the conservation turf in Congo Brazzaville, while they both appear to share territory in the same region of the Central African Republic (CAR/RCA), having created

³⁸³ WWF International, Avenue du Mont Blanc, CH 1196 Gland, Switzerland, Tel: +41 22 364 9111, <http://www.panda.org/>.

³⁸⁴ Wildlife Conservation Society, New York, USA, <http://www.wcs.org/>.

mini-states within states in which researchers are kings and rural communities their surfs (see Section, 11.11.6 Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas & Section 11.11.7, Case study Bongo in the Congo (Brazzaville) concerning WCS).

The general attitude of the NGOs, governments and donors is that rural Africans are incapable of managing their resources, that if tomorrow they were handed over, rural Africans would mine the resources for short-term gains. Likewise, NGOs are afraid of the private sector, which has the potential to employ its own development personnel, eliminating the need for these NGOs. Meanwhile, other than workshops, little effort is made to provide practical exposure to the market place (e.g., taking selected rural community members to international trade shows), or the tertiary level of education needed to allow communities to stand on their own two feet, manage and market their own resources and develop their own financial independence. Thus, the NGOs, governments and Beltway Bandits are a form of neo-colonialists who keep rural Africans poor, dependent and serve as a layer or barrier between rural resource users and access to their resources.

11.10 FOREIGN AID AND THE ENVIRONMENT

“...money does not automatically unlock rural development...millions of dollars have been wasted across Southern Africa in projects that have mostly just provided income for their designers and administrators...The flip side of this gross inefficiency in the use of development budgets has been the irreverent argument that it would be much simpler just to hand the money out to the rural poor rather than spending it on projects that go nowhere. The development industry has never taken that argument seriously” (Turner, 2004 *In: Fabricius, Koch, Magome & Turner, 2004*).

11.10.1 Foreign Aid for “Conservation”?

Colchester (1994; 2003) cites important international laws/proposed laws concerning the rights of indigenous people³⁸⁵ (e.g., Pygmies, San, Dozo, Maasai and other traditional cultures) over their land and resources:

- Draft of the Universal Declaration on the Rights of Indigenous Peoples, Article 3, being developed by the UN's Human Rights Commission, notes: “Indigenous Peoples have the right to self-determination. By virtue of that right, they freely determine their political status and freely pursue their economic, social and cultural development” (United Nations, 1993 *In: Colchester*, 1994; 2003).
- Draft of the Universal Declaration on the Rights of Indigenous Peoples, Article 26 States: “‘Indigenous peoples have the right to own, develop, control and use the lands and territories, including the total environment of the lands, air, waters, coastal seas, sea-ice, flora and fauna and other resources which they have traditionally owned or otherwise occupied or used. This includes the right to the full recognition of their laws, traditions and customs, land-tenure systems and institutions for the development and management of resources, and the right to effective measures by States to prevent any interference with, alienation of or encroachment on these rights’” (United Nations, 1993 *In: Colchester*, 1994; 2003).
- Article 11 of International Labor Organization (ILO) Convention 107 of 1957 states: “‘The right of ownership, collective or individual, of the members of the populations concerned over the lands which these populations traditionally occupy shall be recognized’” (ILO 1957 *In: Colchester*, 1994; 2003). This includes the right to equal compensation if removed from their traditional areas, “as an exceptional measure” (ILO 1957 *In: Colchester*, 1994; 2003).
- Revised 1989 ILO Convention, Article 14 concerning nomadic people and shifting cultivators, “‘measures shall be taken in

³⁸⁵ “World Bank identifies as indigenous peoples 'social groups with a social and cultural identity distinct from the dominant society that makes them vulnerable to being disadvantaged by the development process'" (both Colchester, 1994; 2003). The most recent World Bank (2006) definition is that "...Indigenous Peoples are frequently among the most marginalized and vulnerable segments of the population. As a result, their economic, social, and legal status often limits their capacity to defend their interests in and rights to lands, territories, and other productive resources, and/or restricts their ability to participate in and benefit from development". "The International Labor Organisation (ILO), whose Conventions treat both indigenous and tribal peoples, place more emphasis on the notion of prior residence in an area, before conquest, colonization or the establishment of present state boundaries" (Colchester, 1994).

appropriate cases to safeguard the right of the peoples concerned to use lands not exclusively occupied by them, but to which they have traditionally had access for their subsistence and traditional activities. Particular attention shall be paid to the situation of nomadic peoples and shifting cultivators in this respect' " (ILO, 1989 *In: Colchester, 1994; 2003*). This would include hunter gatherers.

- Revised 1989 ILO Convention, Article 15, " 'The rights of these peoples concerned to the natural resources pertaining to their lands shall be specifically safeguarded. These rights include the right of these people to participate in the use, management and conservation of these resources' " (ILO, 1989 *In: Colchester, 1994; 2003*).
- ILO Convention 169, in Articles 2 & 4 over the need to respect and safeguard indigenous peoples' customs and institutions, while Article 6 obliges States to: " 'a) consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly...c) establish means for the full development of the peoples' own institutions and initiatives, and in appropriate cases provide the necessary resources for this purpose' " (ILO, 1989 *In: Colchester, 1994; Colchester, 2003*).

The IUCN position on indigenous rights with regards to parks, forests, marine and coastal resources, biodiversity and intellectual property rights and oil/mineral rights is linked to ILO Convention 169 (Colchester, 2003).

The following discussions and case studies will demonstrate that these laws are violated daily by international donors, conservation NGOs, Sub-Saharan African governments and their private sector partners in the creation of parks, hunting blocks and other forms of protected areas. The voices of the rural poor go unheeded.

It can be argued that only in Sub-Saharan Africa have peasants, up until now, been able to escape capture by other classes by controlling the means of production. Thus, for many rural Africans "development projects" have been an arm of the government to subdue them, undermining the diversity of resources

(Rosenblum & Williamson, 1990) they need to survive and which often makes their traditional management systems and technologies obsolete. In fact, most development strategies have failed Sub-Saharan Africa to date: 1) Import substitution in the 1960s-1970s, 2) integrated rural development in the 1970s-1980s and 3) Structural adjustment [SAP] from the 1980s to present (Alemayehu, 2000).

In the late 1980s and early 1990s, private foundations, multi- and bilateral donor agencies strongly supported the concept of involving communities in conservation, what was then in vogue: the concept of sustainable development (Chapin, 2004).

In Sub-Saharan Africa, urban-based conservationists and development planners with fixed agendas associated with NGOs and donors, come into rural communities imposing on them demands which, in their eyes, are often inexplicable and unfair. Who should set conservation policy? How should local conservation needs fit into national and global priorities (Adams, 2003 *In: Adams & Mulligan, 2003*)? In most cases it is certainly not rural people making these decisions (see Chapter 9, Section 9.4.2, The Social Equity Strand). This is comparable to donor funded agricultural schemes where local residents are not partners or clients, but a means of production who are denied control over their lives (Sogge, 2002a). In conservation areas, it can be argued that rural people and their needs are secondary to wildlife, maybe even irrelevant.

However, "...environmental protection is often seen as anti-human and a continuation of colonial policies" by local communities (Giles-Vernick, 1999 *In: Maddox, 2002 In: Dovers, Edgecombe & Guest, 2002*).

The preservationist attitude of many Western donors and NGOs is the outcome of societies that have destroyed their large and dangerous wildlife and who are relatively divorced from the natural world (Duffy, 2000). At the same time, Sub-Saharan African governments and local communities detect hypocrisy by Western governments, international organizations and NGOs, especially the World Bank, for simultaneously promoting environmental protection and the exploitation of more resources in the developing world by multi-national corporations (Maddox, 2002 *In: Dovers, et al.*, 2002).

“What is more, such states (both Western and Sub-Saharan African governments) have often proved more responsive to powerful international conservation lobbies which do not always take indigenous needs into account” (MacKenzie, 1997 *In: Griffiths & Robin, 1997*).

In principle, the two concepts can go hand in hand, that is areas set aside for parks, possibly serving as core areas that are surrounded by multiple use conservation areas, such as for logging, hunting and fishing. In principle this sounds fine, but in many instances, as these case studies will demonstrate, the resources are being plundered, local people are not really being empowered to manage and benefit from their wildlife and other resources and most importantly, Westerners, with their urban bias towards what wildlife should be, are imposing their images of African wildlife landscapes on other cultures, using backing from foreign donors. The net result alienates and separates local people from their resources to the benefit of timber companies, safari/tourism operators and white tourist elite (both hunters and game viewers), with a minimum return to the local people when this income is divided at the level of the household (see Chapter 9, Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa). In many cases, cultures have and are being destroyed by this approach to conservation, a form of eco-genocide (see also Chapter 9 on CBNRM).

11.10.2 Negative Impacts of EU Foreign Aid on the Environment and Traditional Cultures

“Third World projects funded under the European Union (EU)’s aid program and administered by the European Commission (EC) are:

- Wrecking the environment of developing countries, including threatening globally important tropical rainforests and destroying local communities;
- Breaching the European Commission’s own guidelines and procedures meant to protect the environment and vulnerable people; and
- Operating behind a ‘veil of secrecy,’ such that members of the public and even European governments are unable to obtain key information on the use of EU money on Third World schemes.

European Commission (EC) projects have led to the eviction of communities from traditional forest lands in Uganda, increased hunting, logging and poaching in Cameroonian forests as a result of road construction from Lomié to Ampiel along the Dja Game Reserve (Southeastern Cameroon), which negatively impacts Baka Pygmies who were never consulted. In addition, poor policies have added pressure on forests in Nigeria and Ghana” (De Sarkar, 1998) (see Section 11.11.6.13, Let the Pygmies be the guardians of the forest).

Although some would argue that there is not much to a Pygmy village, Peterson (2003) gives an example of an entire Pygmy village being bulldozed by a logging company, apparently with little or no consultation, in order to build a sawmill. This is likely one of many atrocities resulting in social upheaval committed in the name of progress in and around the Dja Biosphere Reserve, receiving European Union (EU) funding both in and outside the reserve. Betti (2004) explains that logging³⁸⁶ around the Dja Biosphere Reserve “constitutes a serious problem due

³⁸⁶ Eight logging companies extracted 157,429 m³ of wood have in the “North and the South of the Dja Biosphere Reserve from 2000 to 2003. *Erythrophleum suaveolens* (18,08% of the total volume of all species), *Distemonanthus benthamianus* (13,67%), *Baillonella toxisperma* (11,76%)

to the reduction of wild fruits such as moabi (*Baillonella toxisperma*) for local people and large mammals and due to the intensification of commercial hunting” as well as a decrease in wild medicines.³⁸⁷ The over-harvesting of mammals that act to aid in the germination and distribution of plants [e.g., *Strychnos campagneura* (Loganiaceae) or *Tetrapleura tetraptera* (Mimosaceae) that are scattered by elephant], can have a major impact on floral diversity. More than 70% of the plant species logged in the Dja region are scattered mostly by animals.

11.10. 3 Creation of Powerful Conservation NGOs by Western Donors

“Conservation organizations have traditionally derived their funding from the establishment and have sought to impose their visions through the power of the State. Globalizing conservation only strengthens this tendency” (Colchester, 1994).

Just prior to moving to Senegal as an environmental advisor to the Gambia River Basin Development Organization/*Organisation pour la Mise en Valeur du Fleuve Gambie* (OMVG) in 1982, the U.S. Agency for International Development (USAID),³⁸⁸ who had contracted the principal author, requested him to visit the African Wildlife Foundation (AWF)³⁸⁹ headquarters, a little office above Dupont Circle with an ex-ambassador and a secretary. Raymond Bonner’s book (1993), *At The Hands Of Man* explains how AWF was started by hunters and infiltrated and taken over by non-hunting staff. At the time, World Wide Fund For Nature

and *Milicia excelsa* (11,10%) appear to be the most important trees extracted according to the percentage of the volume exploited” (Betti, 2004).

³⁸⁷ For example, according to the Baka women, “motoko-toko (*Picralima nitida*) is at least twice as strong as chloroquine against malaria, and the ma’ a polo (*Chenopodium ambrosioides*) has a similarly stronger potency than “vermox” against intestinal worms”, *Baillonella toxisperma* (Sapotaceae) or “Mabé” in treatment of lumbago, *Nauclea diderrichii* (Rubiaceae) or Mossé à yooli is for treating malaria/fever (Betti, 2004).

³⁸⁸ USAID, Ronald Reagan Building, Washington, D.C. 20523-1000, Tel: 202-712-0000 Fax: (202) 216-3524, <http://www.usaid.gov/>.

³⁸⁹ African Wildlife Foundation, 1400 Sixteenth Street, N.W., Suite 120, Washington, D.C. 20036, U.S.A., Tel: +1 202 939 3333, Fax: +1 202 939 3332, email: africanwildlife@awf.org, <http://www.awf.org/>.

(WWF)/USA was basically a one-man show - Michael Wright. Look what they are today – both multi-million dollar corporations made by the donors. For instance,

“from 1990 through 2001, USAID provided a total of roughly \$270 million to NGOs, universities, and private institutions for conservation activities. The lion’s share of this amount destined for NGOs was harvested by WWF,³⁹⁰ which received approximately 45% of the available money. A small yet significant portion of the total budget for conservation goes to just five other NGOs—Conservation International (CI),³⁹¹ The Nature Conservancy (TNC),³⁹² Wildlife Conservation Society (WCS),³⁹³ the African Wildlife Foundation (AWF), and Enterprise Works³⁹⁴—through the Agency’s Global Conservation Program” (Chapin, 2004).

Depending on the individual, in some places they are doing some good, as with Chris Weaver of WWF/USA in Namibia on the LIFE Project, or WWF/Zimbabwe supporting CAMPFIRE. In many cases, as in East Africa (see Chapter 9, Section 9.6.3.6, SCP, Tanzania concerning AWF around Tarangire National Park) and Congo Brazzaville [see Section 11.11.7, Case study Bongo in the Congo (Brazzaville) concerning WCS], what do these NGOs have to show for accomplishments, especially among the rural people and their resources? There may be some nice research papers presented at seminars coming from these conservation NGOs, but the average person’s life in the rural areas where they have planted their flags is far from being improved as a result of their

³⁹⁰ World Wildlife Fund, 1250 24th Street, NW, Washington, DC 20037, Tel: (202) 293-4800, <http://www.worldwildlife.org/>, WWF International, Avenue du Mont Blanc. CH 1196 Gland, Switzerland, Tel: +41 22 364 9111, <http://www.panda.org/>.

³⁹¹ Conservation International, 1919 M Street, NW Suite 600, Washington, DC 20036, Tel: (202) 912-1000, Within the U.S.: 1(800) 406-2306, <http://www.conservation.org/xp/CIWEB/home>.

³⁹² The Nature Conservancy, 4245 North Fairfax Drive, Suite 100, Arlington, VA 22203-1606, (703) 841-5300, comment@tnc.org <http://nature.org/aboutus>.

³⁹³ The Wildlife Conservation Society, 2300 Southern Boulevard, Bronx, New York 10460, Tel: 718-220-5100, <http://www.wcs.org/>.

³⁹⁴ Enterprise Works/VITA (Volunteers In Technical Assistance), 1825 Connecticut Avenue NW, Suite 630, Washington, DC 20009 · USA, info@enterpriseworks.org, Tel: 202.293.4600.

interventions. Indigenous communities have never been given the opportunity to design and implement their own programs with Western conservation NGOs controlling the money and calling the shots;

“scientists doing God’s work...a divine mission to save the earth”
 (Chapin, 2004).

Agendas are often different, with rural communities wanting to live off the land without destroying the resources, while the conservation NGOs feel a need to establish protected areas off limits to the local people (Chapin, 2004). In essence, most conservation NGOs talk community, but act neo-colonial. Most should be called preservation NGOs.

Conservation NGOs and consultants know where their bread is buttered, responding more to the politics of the donors than to the needs of indigenous peoples.

“Highly motivated conservationist consultants come to occupy the political space within the State that indigenous representatives have been striving to enter themselves, while at the same time, the conservation institutions, bidding for lucrative consultancies and protected area ‘projects’, adjust their management style to the exigencies of the international agencies that fund them rather than the indigenous communities whose territories they are seeking to conserve. While substantial conservation budgets are lavished on satellite mapping systems, helicopters, jeeps, offices and official salaries, indigenous peoples are increasingly marginalized from decision-making” (Colchester, 1994).

11.10.4 Conservation and Development Work-Shopped Instead of Actually Being Undertaken

The other phenomena which began to evolve in the late 1980s was that development and conservation became one big continuous “Workshop” in which

people meet to talk about development and conservation, with little or no money going to conservation. Nice reports are produced. Many African bureaucrats are out of their offices traveling to workshops and conferences, as “*Per Diem Trips*” that gain them a better income than their actual salary.

Meanwhile, in the case of natural resources, the wildlife and its habitat suffers under a wave of human poverty and misery, which development and conservation fail to alleviate – often exacerbating the problem - with little happening on the ground to address the real issues. This is believed to be a “disease” symptomatic of the “Communication Age” where talk and conceptualizing on emails become more important than actualization. The world seems to be forgetting that conservation must take place in the field with the people using the resources. Ironically, the then Director of Wildlife³⁹⁵ for Cameroon at the regional Southeastern Cameroon Elephant Workshop of May 2000, which the principal author attended, told the NGOs, “it’s about time you stop driving around in your air-conditioned land cruisers, get out and start doing something”. At the time, the Director did not even have a 4x4 for his own use in the field, while the NGOs were “donor” equipped with the latest in technologies and paraphernalia.

11.10.5 Conservation NGOs Consume Money, They Do Not Generate Wealth

“ ‘If you were to base your ideas about the state of the natural world on what the major conservation organizations (NGOs) say, in their magazines, public pronouncements, annual reports, basic advertising, and so on, you would develop the comforting sense that the natural world, although certainly stressed by many very

³⁹⁵ Denis Koulagna, MINEF, Yaoundé, Cameroon.

serious problems, is nevertheless in the hands of good people who are going to save it...the positive message...the sort of thing likely to motivate you to clip out the coupon...your contribution to the future of the planet...thanks to you and other right-minded people...But why, then, when you read the newspapers, or when you actually look for yourself, travel to one of the critical spots of biodiversity, do you find that things are actually getting worse...Why are you led to believe that the world's great wealth of biodiversity is being saved, when in so many places you can see for yourself that it is seriously on the decline' (Photographer Karl Ammann *In:* Peterson, 2003)...Karl believes, mainstream conservation organizations...have become professional purveyors of environmental pabulum, seldom challenging the expectations, knowledge, or sympathies of their target audience, and thus ultimately promoting what he has come to identify as 'feel good conservation'...institutional conservation has decided that the public back home simply cannot bear very much reality" (Peterson, 2003).

Most conservation NGOs spend money, their programs depending upon continual infusions of funds from outside sources. For instance, the top seven executives of Wildlife Conservation Society (WCS) earned a total of more than US\$ 2.6 million in the year 2000 (Peterson, 2003). Fairhead and Leach (2003) demonstrate how in Guinea-Conakry, NGOs, various levels of government officials and even villagers *per diems* and transport depend upon donor money. Elaborate bureaucratic processes are required in order to become established as a community body (e.g., Forestry Group) able to legally exploit resources. Western donors pay various levels of bureaucrats for signing off on elaborate management plans. Donors pay NGOs to develop these plans and provide oversight. It is in the financial interest of the NGOs to create more paperwork and even more complex procedures, as a means of expanding their work, justifying their existence and creating a permanent need for their services. NGOs become another level of bureaucracy between rural communities and their resources, indirectly living off communities through donor funding and often through failed integrated rural development schemes that continually cut off rural communities from accessing and

sustainably managing their natural resources in favor of “farmed resources” (e.g., fish culture, agro-forestry, farming cane rats and growing herbal medicines) Although they claim to support devolution, their economic interests promote more state intrusion. These NGOs have no entrepreneurial side to them. They do not generate wealth from Sub-Saharan Africa’s resources. This is the role of the private sector, ideally community-owned companies or partnerships, as a means of assuring a fair share of the wealth generated from resources staying with the community. Fairhead and Leach (2003) observed major tensions between rural communities and many NGOs, seeing them as being linked to an extension of a predatory non-representative state and its intrusiveness on their lives.

Most NGO conservation programs are not sustainable without donor funds. Unfortunately, since they control foreign aid in Sub-Saharan Africa’s conservation arena, they call the shots when it comes to conservation policy in SSA countries. Since they do not depend on the wildlife resource and the wealth generated from it to survive, they can afford to tie up the resource by applying preservationist/precautionary principles while living off donor handouts. This is usually at the expense of the wildlife and the rural poor living among the wildlife. In trying to survive, the rural poor opt for other land uses, wiping out both wildlife and their critical habitat, often poaching for short-term gains.

11.10.6 Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers

“It is the way people work with nature rather than the way nature works that will ultimately determine the future of conservation. Hence our suggestion that it is more productive to use political economics and market failure rather than ecological diversity as

the analytical frame to address conservation" (Child, B, 2004b *In:* Child, B. 2004a).

"It's no secret that millions of native peoples around the world have been pushed off their land to make room for big oil, big metal, big timber, and big agriculture. But few people realize that the same thing has happened for a much nobler cause: land and wildlife conservation. Today the list of culture-wrecking institutions put forth by tribal leaders on almost every continent includes not only Shell, Texaco, Freeport, and Bechtel, but also more surprising names like Conservation International (CI), The Nature Conservancy (TNC), the World Wildlife Fund (WWF), and the Wildlife Conservation Society (WCS). Even the more culturally sensitive World Conservation Union (IUCN) might get a mention...Financial support for international conservation has in recent years expanded well beyond the individuals and family foundations that seeded the movement to include very large foundations like Ford, MacArthur, and Gordon and Betty Moore, as well as the World Bank, its Global Environment Facility (GEF), foreign governments, USAID, a host of bilateral and multilateral banks, and Transnational Corporations (TNCs). During the 1990s USAID alone pumped almost \$300 million into the international conservation movement, which it had come to regard as a vital adjunct to economic prosperity. The five largest conservation organizations (or BINGOS/Big conservation NGOs), CI, TNC, and WWF among them, absorbed over 70% of that expenditure" (Dowie, 2005).

"The death blow of a nature reserve is not a figure of speech. It is not a metaphor for social disintegration and collapsing values. Dispossession threatens their livelihood and therefore their lives", (John Marshall³⁹⁶ & Olga Levinson³⁹⁷ *In:* Rosenblum & Williamson, 1987). "Whatever anyone outside Africa decides, neither wild animals nor land will be conserved unless Africans decide it is in their interest to do it...Animals will never be treated well if humans are treated badly" (Rosenblum & Williamson, 1987).

³⁹⁶ Author, researcher and filmmaker on Bushmen of Namibia

³⁹⁷ Author on books about Namibia such as Story of Namibia, South West Africa and The ageless land: The Story of South West Africa

This still holds true in the 21st century for many indigenous people, as pressure from the West has accelerated the expansion of parks and protected areas across Sub-Saharan Africa, ignoring their traditional ties to the land and nature resources, both for survival and cultural purposes.

11.10.6.1 Urban preservation philosophy imposed on rural Africans

“Increasingly, as wildlife has been perceived by urban viewers as '*choses à penser*' rather than '*choses à manger*', [footnote: 'things to think about' rather than 'things to eat'] the focus of much conservation has been on what have come to be known as the 'charismatic mega-fauna' - big spectacular animals of widespread popular appeal. Conservation of these species has absorbed the lion's share of the conservation budget” (Colchester, 1994).

“ ‘The concept of wilderness as the untouched or untamed land is mostly an urban perception, the view of people who are far removed from the natural environment they depend on for raw resources. The inhabitants of rural areas have different views of the areas that urbanites designate as wilderness, and they base their land-use and resource management practices on these alternative visions. Indigenous groups in the tropics, for example, do not consider the tropical forest environment to be wild; it is their home.’ ” (Gomez-Pompa & Kaus, 1992 *In: Colchester, 1994*).

A Western “urban” environmental consciousness emerged out of the 1970s with a realization that the West’s achievements in its technological and material advancements had been at the cost of polluted rivers and streams and acid rain among others (see Chapter 7, Section 7.8.2.1, History of environmental planning in America).

“As ecological awareness has grown, the focus has also shifted from the conservation of species (so-called alpha conservation) to the conservation of habitat (so-called beta conservation), a shift reflected in the change of name of one the largest conservation organizations, the World Wildlife Fund (WWF), to the WorldWide

Fund for Nature. Special measures to protect areas of intense species endemism have led to the development of a third kind of conservation (referred to as gamma conservation)" (Huber, 1993 *In: Colchester, 1994*).

In much of Sub-Saharan Africa, these concepts of conserving mega-fauna and biodiversity, linked to conservation and development, have been fused into the creation of mega-areas called Transfrontier Conservation Areas (TFCAs), disenfranchising people on an even grander scale [see Section 11.11.5, Transfrontier Conservation Areas (TFCAs), Southern Africa]. Protected areas, both large and small, terrestrial or marine, remain a priority for many international donor agencies as the most practical way of conserving the greatest amount of biodiversity (Colchester, 1994).

Linked to this environmental awareness, Western donors became increasingly frustrated over the failure of government-to-government loans and grants for state led development, while at the same time there was growing concern that the failure to develop was placing tremendous pressures on rural Sub-Saharan Africa's natural systems and their resources. Western conservation and food relief NGOs were "Johnny's on the Spot" and were bolstered by foreign aid to find the solution for Sub-Saharan Africa's environmental degradation (see Section 11.10.6.2 "Conservation and development" a continuation of failed "integrated rural development" linked to "preservation").

Because these NGOs live off international donor money, they have a major influence on parks and protected area policies. In many cases, one would think that many parks and protected areas are run by these NGOs and not governments and that these areas are for researchers and foreign tourists, not local Africans. As Barrow, Gichohi, and Infield (2000) explain,

“Many NGOs have 'taken over a park' for the purpose of supporting community conservation work”.

Ogwang and DeGeorges (1992) observed in Uganda, but this applies across the board in Sub-Saharan Africa where Western researchers “plant their flag” and create their empires that

“In the February 1992 Kibale Forest Buffer Zone Conference hosted by the PVO-NGO/NRMS Project (funded by USAID), there was concern raised that rather than being managed with a common set of objectives, each park in Uganda tends to be controlled by a given conservation NGO with its own agenda as to what a park should become (Tukahirwa, *pers. comm.* In: Ogwang & DeGeorges, 1992).³⁹⁸ In many instances, their (NGO) goals may be counterproductive to park policy or contrary to the development of good relations with local communities.

Uganda National Parks must more clearly define the relationship between these NGOs and the Chief Park Warden/Management Committee. These NGOs and their associated researchers should be there to provide scientific data and advice to the warden and the management committee as to what actions might be taken to assure sustainability of the park on both economic and ecological grounds. The Warden and the Management Committee should be in the driver's seat, not the NGO. Unfortunately, at present too often, this does not appear to be the case” (Ogwang & DeGeorges, 1992).

³⁹⁸ Dr. Eldad Tukahirwa, Director, Makerere Institute of Environment and Natural Resources.

At the time, one would have thought that Bwindi was a WWF park, Queen Elizabeth National Park a GTZ park and Kibale Forest a Wildlife Conservation Society (WCS) park, with little or no relevance to local communities or Ugandan society as a whole. de la Harpe, Fernhead, Hughes, Davies, Spencely, Barnes, Cooper and Child (2004, *In: Child, B., 2004a*) conclude that current park and protected area policy in most of Sub-Saharan Africa serves only interests of urban (mostly overseas tourists and trophy hunters) and elite (e.g., governments, NGOs, tourism and safari operators) segments of society. They believe that this will likely produce a scenario of shrinking national park estates and for that matter, protected areas – implying that rural people seeing no long-term value in these areas will continue opting out for other land uses.

In the authors' view these "Western NGOs", be they local or international, have a suburban mentality. "Biodiversity" and "Preservation" are for salaried people who buy their food at a supermarket. Suppose tomorrow, the world's suburbanites went to the supermarket and, low and behold, there were armed soldiers blocking the entrance, explaining that the contents of the supermarket were for foreigners from overseas. How would people react to their very basis of survival and that of their families being confiscated; the resources that nurture their families? Is this any different to a rural African whose grocery store is the forest, savanna, streams and lakes that provide his family with critical foods and medicines that supplement on-farm produce? How should we expect someone whose life and survival is so closely tied to these resources to react when a conservation NGO in an air-conditioned land cruiser shows up and explains that these resources are no longer available, that this critical area to the survival of a rural community is now a park or hunting block to be enjoyed by and benefiting everyone but the very people who have been its stewards for hundreds of years?

As Nelson (2003a) states, “ ‘the rural poor in Africa tend to be weak and marginal to their countries’ affairs...they can be, and often are, ignored by their rulers’ (Brockington, 2002 *In: Nelson, 2003a*). By contrast, ‘conservation receives continual and valuable support from a number of non-governmental organizations (NGOs), which lobby and raise money for conservation causes. They provide valuable funds to African governments’ ” (Brockington, 2002 *In: Nelson, 2003a*).

Foreign tourism, both consumptive and non-consumptive, also brings in large revenues that can be used to support the Africans who staff government agencies. The NGOs are important, not only for the direct infusions of money they contribute, but also for the political legitimacy they provide.

According to Brockington (2002 *In: Nelson, 2003a*), “ ‘the resources provided by conservation interests, as well as the powerful rhetoric of providing for future generations, may serve to justify the existence of protected areas to government officials.’ ”

Thus, African government park and game departments become more responsive to the desires of Western NGOs and donor whims on how protected areas should be managed, than to the desires and needs of the peripheral communities.

11.10.6.2 “Conservation and development” a continuation of failed “integrated rural development” linked to “preservation”

Western donors groped in the dark for a solution to development and overcoming Africa’s backwardness, since solving rural Africa’s problems on the farm; an “integrated rural development” approach, had failed in the 1970s and 80s. The NGOs, being handed donor money, be they “development” NGOs or supposed “conservation”, but mostly Western “preservation” NGOs, had no experience in natural resource management and an urban preservationist bias. The new buzz word became “conservation and development”, which is another way to say

“preservation” or no use linked to failed “integrated rural development” approaches.

Conservation NGOs linked to development

Another phenomenon, which began to occur in post-colonial Sub-Saharan Africa, is that resource managers of colonial times, who started out working as game rangers and through a series of apprenticeships, eventually rose to manage a game reserve, were replaced by doctoral researchers. These researchers were trained in and/or from America and Europe who studied wildlife and tested hypotheses, but who had no training in resource management, or ideological foundations in sustainable use. This is especially true in Kenya and Uganda.

Researchers not managers, dominate the majority of the conservation NGOs being given conservation and development money. Many were introverts; scientists and researchers studying single species among Africa’s charismatic mega-fauna; people who were happier studying wild dog, elephant, gorilla and chimpanzee, but with no experience in dealing with people or development, let alone managing or valorizing wildlife or other natural resources. They were flooded with money to link conservation and development. As described by Fairhead and Leach (2003), donor funded NGO projects tend to be staffed by scientists, very often uninterested or incapable of relating to rural people – caring more for wildlife than human beings. These NGO projects, through a grey, often glossy, literature, with little or no peer review, project environmental history in their eyes – “networked into the global policy and research community” contributing to the “accumulation of ‘lessons learned’ and to the ‘cutting edge’, globally relevant reputations of those who designed them” (Fairhead & Leach, 2003). Myth becomes reality if repeated enough by many individuals and NGOs through

global media, with such themes as “elephants are endangered”, “parks are saving wildlife”, and “preservationist policies are helping rural communities develop”.

These researchers and their NGOs tend to know only how to study nature, but not how to use it sustainably. Thus, they tend to take a protectionist precautionary principle approach to what they inappropriately call conservation, which by its definition requires a sustainable use component, although there are always exceptions that are dependent on individuals more so than the organization (see Chapter 9, Section 9.2.1, Precautionary Principle; Studying Wildlife to Extinction). Overnight, these impoverished NGOs and their researchers were given control over development money and *de facto* control over vast chunks of Sub-Saharan Africa, its parks and protected areas and, more importantly, control over how and if Africans accessed their natural resources. In essence, these NGOs, through the money they controlled *de facto* determined African conservation policies. This includes NGOs such as the Wildlife Conservation Society (WCS), Conservation International (CI), World Wildlife Fund (WWF)/World-Wide Fund For Nature, African Wildlife Foundation (AWF) and The Nature Conservancy (TNC). They became all-powerful “conservation gods”.

Development NGOs linked to conservation

In the other extreme, people and organizations with backgrounds in food relief and maybe on-farm development (e.g., CARE and Catholic Relief Services), but no resource management backgrounds, were given money to link conservation and development. Having no resource management skills, they also opted for more “Sherwood Forests”, that is, protected areas. Most parks in Sub-Saharan Africa have become hard-edged, surrounded by poverty. In these zones of poverty, they created tree farms (see Chapter 9, Section 9.8.9.3, Community based natural forest management, “*Gestion des Terroirs*”, Burkina Faso), which

most people did not want, set up fish culture ponds and pushed improved agriculture, though most were neither soil scientists nor agronomists. In some cases, they tried to raise culturally or commercially important plants from the forest in gardens on agricultural lands. No natural systems were managed. Local communities were actually cut off from accessing their natural resources or had to “poach” them.

Thus, in both cases the scientists/researchers and aid NGOs went for failed “integrated rural development”, on the farm, as opposed to helping rural communities sustainably manage a diverse portfolio of sustainably managed natural resources (soil, forests, wildlife, fish, bees and wild plants) as a means of improving local economies. Sogge (2002a) believes integrated rural development failed because it tried to impose new power structures answerable to donors (or their NGO surrogates) and because it opened the door to local opportunists, answerable only to themselves. What this implies is that it bypassed traditional management systems and controls, as described in Chapter 2. Meanwhile, in most cases, preservationist approaches continue to exclude rural communities from their natural resources.

Ultimately, from conservation to development, NGOs have been tools to retain neo-colonial controls over Sub-Saharan Africa, taking over from missionary societies of the colonial era “in expanding and consolidating neo-liberal hegemony in the global context” (Manji & O’Coill, 2005). These “modern day ecological missionaries” came to “Save African Wildlife from Africans” and were every bit as harsh as their colonial masters. Parker (2004) equates the young western biologist of today, going forth into the Third World to preach conservation (in most cases meaning preservation) to colonial missionaries and doctors who went forth to stop slavery (i.e., today stop poaching). He equates the Church Missionary Society and the Universities’ Missionary Society to WWF,

IUCN and similar bodies, with those at the top living nicely. As with the missionary David Livingstone, the modern conservationist is more concerned with cash flow than truth and accuracy. Similarly, as Livingstone was responsible for 19th century Victorian perceptions of Africans as primitives without history (Parker, 2004), modern conservationists are responsible for degradation narratives that Africans are incapable of managing their natural resources. “Degradation narratives” that Africans are incapable of managing their own resources, are often used to justify international organizations taking control of resources from African states. What little we know about African environments is almost fatally compromised by degradation narratives essential for colonial control and carried on to the present (Giles-Vernick, 2002; Maddox both 2002 *In: Dovers, et al.*, 2002). Some call their actions “eco-colonialism”, “environmental colonialism” (Nelson, 2003a) or “eco-imperialism” (Duffy, 2000). Child, B. (2004b *In: Child, B., 2004a*) believes that a highly disproportionate number of people employed in national and international conservation organizations are based in capital cities linked to powerful special interest groups, who are in turn linked to Western donor money, as discussed. This is the Achilles heel of liberal democracies where 1% of the population has the power and the money to disenfranchise the interests of the 99%, especially those living with nature in rural areas, with the end result of huge economic inefficiencies and inequities being created.

11.10.6.3 Few success stories with the 10% factor

“In 1962, there were some 1,000 official PAs (protected areas) worldwide. Today there are 108,000, with more being added every day. The total area of land now under conservation protection worldwide has doubled since 1990, when the World Parks Commission set a goal of protecting 10% of the planet's surface. That goal has been exceeded, with over 12% of all land, a total area of 30.4 million km² (11.75 million square miles), now protected. That's an area greater than the entire land mass of Africa” (Dowie, 2005).

The net results are visually evident. Look across the Sub-Saharan African landscape at over 40 years of Western development aid and you will look hard and far to find a true success story, other than more protected areas and more alienated Africans who poach to access resources which should be sustainably managed through the formal integration of Africans into their harvest. In Sub-Saharan Africa, over a million km² of land has been set aside as national parks and game reserves (Hitchcock, 1990 *In:* Colchester, 1994; 2003), yet they have been remarkably unsuccessful at protecting wildlife (Colchester, 1994; 2003). Given today's human populations, creating classical protected areas of exclusion, with the IUCN goal of 10%³⁹⁹ of a national territory under such regimes (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003), can only happen at the expense of displacing and compressing rural Africans along with increased impoverishment and habitat degradation in the compressed areas (Table 11.10).

In Africa alone, it is estimated that there are as many as 14 million displaced persons from creation of parks and protected areas, 600,000 alone in Chad during the 1990s from the increase in national land under protection of 0.1% to 9.1% (Dowie, 2005). Based upon a range of 1-16 persons/km², it is estimated using 1997 IUCN protected area categories I-V (1,540,430 km²) that from 1.5 and 24.5 million (900,000 to 14.4 million using categories I-III) people have been displaced from creation of African parks and protected areas. Using a density of about 25 persons/km², and the same 1997 data, a range of from 22.9-39.5 million displaced persons is obtained, mostly within the last 3 decades of the 20th century (Geisler & de Sousa, 2000).

³⁹⁹ Fairhead and Leach (2003) state the IUCN goal as 10% of all terrestrial ecological regions worldwide.

“People are confined to small and inappropriate land areas; traditional social institutions and patterns of land management and tenure, which used to regulate access to resources are undermined. Short term problem solving behaviors replace long term planning. The net result is environmental degradation” (Colchester, 1987 *In:* Colchester, 1994; 2003).

Table 11.10: Sub-Saharan Africa UNEP-WCMC data base of IUCN management categories

Country	Total Country Area(km ²) (1) & (2)	# In 1996 Ha (1)	%Land Area Protected In 1996 >1,000	# In 199 Protected In 1996 >1,000	% Land Area Protected In 1997 (2)	# In 2004 (3)	% Land Area Protected In 2004 (3)	% Increase In Protected Areas 1997- 2004
Angola	1,246,700	6	2.12	13	6.6	16	12.4	88
Benin	112,620	2	6.90	5	11.2	59	23.47	110
Botswana	575,000	9	18.54	12	18.3	71	30.19	65
Burkina Faso	274,122	12	9.71	12	10.4	83	15.36	48
Burundi	27,835	3	3.19	13	5.3	15	5.25	0
Cameroon	475,500	14	4.31	18	4.4	29	8.73	98
Central African Republic	624,975	13	9.77	14	8.7	69	16.59	91
Chad	1,284,000	9	8.95	9	9	32	9.33	4
Congo	342,000	10	3.44	12	5	21	14.25	185
Cote d'Ivoire	322,465	12	6.18	11	6.2	325	17.01	174
Djibouti	23,000	1	0.43	2	0.4	2	0	0
Equatorial Guinea	28,050			0	0	13	20.89	1,300?
Eritrea	117,600			3	4.3	3	4.26	0
Ethiopia	1,104,300	23	5.45	39	16.9	40	16.86	0
Gabon	267,665	6	3.90	5	2.7	9	4.41	63
Gambia	10,690	5	2.15	6	2.1	72	5	138
Ghana	238,305	9	4.63	16	5.3	321	15.46	192
Guinea- Conakry	245,855	3	0.67	3	0.7	151	6.38	811
Guinea- Bissau	36,120			0	0	9	11.19	900?
Kenya	582,645	36	6.01	68	7.8	1348	13.0	67
Lesotho	30,345	1	0.22	1	0.2	1	0.22	0
Liberia	111,370	1	1.16	1	1.2	16	14.17	1,080
Madagascar (Malagasy Republic)	594,180	37	1.88	46	2.1	60	3.14	50
Malawi	94,080	9	11.25	9	11.3	130	16.38	45
Mali	1,240,140	11	3.24	13	3.7	16	3.76	2
Mauritania	1,030,700	4	1.69	9	1.7	9	1.70	0
Mozambique	784,755	1	0.00	13	8.9	42	9.39	6
Namibia	824,295	12	12.40	21	13.6	174	18.30	35
Niger	1,186,410	5	7.09	6	8.2	6	6.64	-19
Nigeria	923,850	19	3.22	27	3.3	1,009	6.20	88

Table 11.10 (Cont.): Sub-Saharan Africa UNEP-WCMC data base of IUCN management categories

Country	Total Country Area(km ²) (1) & (2)	# In 1996 Ha (1)	%Land Area In 1996 In 1,000 Ha. (1)	# In 1997 Protected In 1996 > 1,000 Ha. (2)	% Land Area Protected In 1997 (2)	# In 2004 Protected In 2004 (3)	% Land Area Protected In 2004 (3)	% Increase In Protected Areas 1997-2004
Rwanda	26,330	2	12.42	7	15.1	5	7.62	-50
Sao Tome Principe	960			0	0	0	0	0
Senegal	196,720	10	11.09	14	11.4	14	11.40	0
Sierra Leone	72,325	2	1.13	6	2.1	55	4.52	115
Somalia	637,660			10	0.8	16	0.82	2.5
South Africa	1,184,825	237	5.85	405	5.6	565	6.46	15
Sudan	2,505,815	16	3.74	27	4.9	28	4.92	0.4
Swaziland	17,365	4	2.64	5	3.5	8	3.46	-1
Tanzania	939,760	30	14.78	88	27.9	810	39.85	43
Togo	56,785	11	11.39	9	7.6	93	11.45	51
Uganda	236,580	31	8.07	54	20.8	747	26.29	26
Zaire/DRC	2,345,410	8	4.23	42	6.2	84	8.42	36
Zambia	752,615	21	8.46	68	30.1	683	41.49	29
Zimbabwe	390,310	25	7.86	69	12.8	249	14.72	15

Extracted From: (1) WCMC (1996) (2) UNEP/WCMC (1997) (3) UNEP-WCMC (2004) with permission, Jon Hutton Director, United Nations Environment Program-World Conservation Monitoring Center (UNEP-WCMC)

“As long as conservation operates on the notion that saving wild animals means keeping them as far away as possible from human beings, it will become less and less relevant to modern Africans. Parks and other protected areas will eventually be overrun by people's need for land unless the parks serve, or at least are not completely inimical to, the needs of the local population...Conservation will either contribute to solving the problems of the rural poor who live day to day with wild animals, or those animals will disappear” (Adams & McShane, 1992 *In: Colchester*, 1994; 2003).

Sadly, to date, none of the human rights NGOs have held the conservation NGOs accountable for what they are doing to indigenous peoples in the name of conservation; resulting in environmental degradation, impoverishment, malnourishment and cultural genocide. It would seem that words like “biodiversity”, “conservation” and “endemism”, are part of some holy grail that is

there for the good of mankind and not to be questioned. These NGOs appear accountable to no one.

“The challenge is to find a means of making conservation organizations accountable to what is for them an unfamiliar constituency, indigenous peoples, so that they are obliged to treat indigenous peoples' concerns with the seriousness they deserve” (Colchester, 1994; 2003).

Magome & Murombedzi (2003 *In:* Adams & Mulligan, 2003) estimate that for South Africa to attain the goal of 10% of its lands in protected areas as defined by the IUCN, about 50,000 km², equivalent⁴⁰⁰ to 2.5 times the size of Scotland, must be acquired. If one adds in the 1999 estimate of 17 million ha in private game ranches (African Advisory Board, 2000), though not considered part of the protected area network, they are 2.2 times South Africa's protected area network and four times the amount of land needed to achieve 10%. It should also be noted that in 2004 Cameroon is actually believed to have 15% of its territory in parks and protected areas and is still increasing this percentage, with a goal of 30% (see Chapter 10, Section 10.7.2.1, Enhancement under the ESA linked to CITES, condemning more wildlife to die? - Enhancement Under The ESA As An Impediment To Conservation Of Cameroon's Elephant).

⁴⁰⁰ Note: By the latest information in Table 11.10, about 41,943 km² must be turned into parks and protected areas (an area slightly larger than Holland, 1.4 times the size of Belgium and 21% of France).

11.10.6.4 Slum lords, only more compression of Africans into unsustainable areas

“Parks cannot be islands of conservation in a sea of often-degraded resources supporting a growing social demand...the local picture is not all optimistic. Many regional national parks and equivalent nature reserves that have been held up as flagships of conservation are in a sad state...paper parks, others are animal slums...poaching is increasing...a failure of the way in which parks and reserves around the world are being managed...a system that owns 10% of the global real estate, but must be subsidized to survive”. (Child, G., 2004 *In:* Child, B., 2004a).

About 40% of Tanzania has been set aside as parks and protected areas. One has to ask, where are the people to live? A fine example of the accelerated habitat degradation from the compression of people onto land that cannot support them, is evident in the hard-edged effect created along the eastern boundary of the Kigosi hunting block, Western Tanzania. The Kigozi Game Reserve/hunting block consists of Miombo (*Brachystegia* spp.) woodlands, while the adjacent inhabited area on its eastern boundary is virtually denuded of these woodlands. Victor Harley (*pers. comm.*), while undertaking game counts with Tanzania Wildlife Research Institute (TAWIRI) in September 2004, observed indications of scattered forest clearings within the game reserve/hunting block, most likely from desperately poor rural people clearing land within the interior, where they cannot be easily detected, for charcoal production and cultivation. As noted, the principal author observed similar activities in the classified forests of Senegal in the 1980s, where rural people left the periphery of the forests untouched so that passing game department officials would not easily observe that they were clear-cutting the interior for charcoal. There is no doubt that poaching is also a problem (see Chapter 5, Section 5.9.4.7, Deforestation in savanna environments - Deforestation in Senegal Linked to Charcoal Making, Over-Population and Declining Fallow Periods).

The Western world seems to have forgotten that there were people using these natural areas before they were declared parks, game and forest reserves. By compressing people onto land that can no longer support them (e.g., similar to homelands in South Africa, communal lands in Zimbabwe and tribal lands in Kenya), the Western conservation world is forcing rural Africans 1) To degrade their environment and 2) To flock to the cities in search of a better life, which usually is not there, resulting in “politics of despair”, returning to the rural areas to illegally access and eventually mine the resources of protected areas which are no longer being managed, but defended against people who have been alienated from Western ideas of conservation (see Chapter 9, Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”). Is this any different than what happened during the colonial era to the Red Indian in North America or Sub-Saharan Africa where indigenous people were displaced, to make way for European farmers, onto reservations, homelands or communal areas that could neither ecologically nor economically support them? Only today, people are being displaced in the name of the elephant, gorilla and wildlife in general, with the same dire economic and social consequences and impoverishment; agendas pushed by Western NGOs and supported by donors and African political elite. This is what might be called “Global Apartheid” in which tracts of land are being set aside for a “Global Elite”, consisting of eco-tourists, safari hunters, the private companies who serve these clients, governments and Western NGOs and their researchers. Such elitist “Sherwood Forests” did not work in merry old England and they can in no way work as long as the majority of Africans are stuck in Phase I subsistence lifestyles (see Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA). Rural Africans do not get a pay check each month and they do not have the luxury of buying their food at a supermarket. In addition to what they can grow, the savannas and forests of Sub-Saharan Africa offer them a diverse array of resources (e.g., bushmeat, honey, fish, other wild foods, medicines, wood/charcoal, etc.) which they need for both economic

purposes and for survival, especially as reserves during emergencies, such as during droughts or outbreaks of pests (e.g., locusts and mice). By making these natural systems off limits without alternative livelihoods, is condemning many rural Africans to abject poverty. In a worst state scenario, as will be seen below, in Cameroon (see Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas), it compresses people into areas that can no longer support them, resulting in habitat degradation on the periphery of the protected area, and potentially starvation, death and cultural genocide. Certainly, this cannot be what the West or Sub-Saharan African governments want from conservation.

11.10.6.5 IUCN Category VI, most appropriate into today’s Sub-Saharan Africa

“It is time that conservationists began to start their work in areas inhabited by indigenous peoples from the assumption that they are dealing with local people with legitimate rights to the ownership and control of their natural resources. The creation of protected areas may not be the most appropriate option in such circumstances, as in most cases indigenous ownership rights are denied by protected area legislation” (Colchester, 1994).

IUCN Management Categories (Chape, Blyth, Fish, Fox & Spalding, 2003) are contained in (Table 11.11). In the authors’ opinion, unless there is a major drive to modernize and urbanize Sub-Saharan Africa, which should be a major goal, the only hope for a successful 10% goal of national lands in natural areas is for the majority to fit into Category VI, sustainable use for community needs. This could include developing a land use plan for multiple use of natural resources with revenue generating components.

Table 11.11: Definitions of IUCN Protected Area Management Categories	
CATEGORY Ia: Strict Nature Reserve: protected area managed mainly for science	Area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring.
CATEGORY Ib: Wilderness Area: protected area managed mainly for wilderness protection	Large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.
CATEGORY II: National Park: protected area managed mainly for ecosystem protection and recreation	Natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.
CATEGORY III: Natural Monument: protected area managed mainly for conservation of specific natural features	Area containing one, or more, specific natural or natural/cultural feature which is of outstanding or unique value because of its inherent rarity, representative or aesthetic qualities or cultural significance.
CATEGORY IV: Habitat/Species Management Area: protected area managed mainly for conservation through management intervention	Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species.
CATEGORY V: Protected Landscape/Seascape: protected area managed mainly for landscape/ seascape conservation and recreation	Area of land, with coast and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.
CATEGORY VI: Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems	Area containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs.
Source: Chape, Blyth, Fish, Fox and Spalding (2003) with permission, IUCN.	

Might it not be a better idea to give these protected areas over to local communities, train up their youth at university level in diverse fields such as tourism, wildlife, fisheries, forest and range management, as well as agriculture, so that they can create community-owned companies and manage these areas to the benefit of the community, as described in Chapter nine (see Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders)? Profits could go towards both development and sending as many youth as possible off to universities to study everything but conservation, so that they can eventually earn a living in an urban setting as part of a global society, taking the pressure off rural Sub-Saharan Africa's limited natural resources, given current human and livestock populations.

de Haan, *et al.* (1997) argue that for many natural areas to survive, they must integrate rural inhabitants living on the land into their management and multiple-use,

"For the sub-humid tropical savannas, the emphasis has to be on the development of multiple uses, combining sustainable farming systems with integrated wildlife-livestock management and the establishment of a few protected areas for key plant and animal species. However, with increasing population pressure, this becomes more difficult. Furthermore, many government agencies in the developing world are too weak and, in the developed world, too dependent on political fashion, to rely (relying) exclusively on protected areas for biodiversity conservation, especially for big game of the sub-humid savannas. Eco-tourism and commercial (trophy) hunting would need to be integrated with commercial livestock production and mixed farming".

This will also need to include other resource uses to maximize both survival and economic benefits as a means of justifying to rural people the maintenance of these natural systems.

Unfortunately, de la Harpe, *et al.* (2004, *In: Child, B., 2004a*) believe that it is in the interest of the entrenched bureaucratic-cum-scientific elite to maintain the status quo and the power of the state, often linked to power, accumulation, patronage and corruption through control of wildlife and other natural resources.

However, subsidized biodiversity conservation and highly centralized park management are being questioned in favor of a decentralized model, localizing management and benefits with parks serving as bridgeheads for wildlife-based economic development (Child, *et al.*, 2004a *In: Child, B., 2004a*). de la Harpe, *et al.* (2004, *In: Child, B., 2004a*) believe that conservation as currently practiced in Sub-Saharan African, is not sustainable since without commercialization and as a result of the low funding to wildlife and park departments across the continent, these agencies are unable to satisfy either biodiversity or social goals. de la Harpe, *et al.* (2004, *In: Child, B., 2004a*) and Child, Castley, Knight, Gordon, Daitz, Johnson, Boonzaaier, Collinson, Davies, Grossman, Holden, Kiss and Fernhead., (2004b *In: Child, B., 2004a*) are calling for a paradigm shift, especially within Sub-Saharan Africa's parks, but in protected areas in general with the idea of parks and protected areas becoming "engines of economic growth", with biodiversity being a welcomed by-product as opposed to the situation today where biodiversity is the major goal. They conclude that for parks in Sub-Saharan Africa to survive these human pressures, they must pay their own way as long as ecological management is sustainable.

This implies opening up parks to any number of income generating activities such as trophy hunting, private sector lodges and traditional activities such as thatch grass harvesting, honey collection, fishing, traditional medicine harvest and traditional hunting, as long as what is happening is sustainable ecologically and economically. In essence, parks and protected areas in Sub-Saharan Africa will have to become "living factories" without walls, sustainably producing renewable

products with the majority of profits accruing to rural communities at both an individual and collective level.

Ron Thomson (*pers. comm.*) former park warden for both Hwange and Gonarezhou national parks, Zimbabwe, has advocated trophy hunting in parks for many years. Each park will have to be dealt with on a case-by-case basis as to what peripheral communities desire from these areas and how these needs and desires can be integrated into management of the park on a sustainable basis without adversely impacting biodiversity. Possibly older redundant animals, such as hundred pound elephants about ready to die from old age, should be trophy hunted to generate income for park management and the communities?

The West must realize that as things stand, it is only making matters worse in creating massive exclusion zones that have nothing to do with the value systems or needs of people living close to and off of nature and who, as things currently stand, will only see the inside of a park/protected area illegally. Parks and protected areas, as they currently exist, are not meant for Africans. This will have to change if Sub-Saharan Africa's natural systems are to survive the next 50 years and a more than doubling of the current human population. This will require a major paradigm shift in defining conservation in SSA and it will have to be people oriented,

“The Need To Take Care Of People First In Order To Take Care Of Wildlife... unless the rural people of Africa, who live among wildlife, see its economic potential, no amount of market driven prohibitions, nor Western funded anti-poaching will save Africa's wildlife. Africa's human population is expected to double and in some cases triple over the next 25 years⁴⁰¹. Either rural Africans see wildlife as their economic and cultural future or wildlife and its

⁴⁰¹ Human population will increase about 2.8 times between 2000 and 2050 to about 1.8 billion people (see Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY

critical habitat will disappear, being converted into subsistence mealie (corn) fields and over-grazed pasture. What little is left will be surrounded by a sea of humanity which will eventually devour the remaining islands of nature on private farms and public lands” (SCI African Chapter, 1996).

The role of parks and game departments must become one of service and value, as opposed to a culture of control (Child, *et al.*, 2004a *In:* Child, B., 2004a). To think that parks and protected areas in any other format can survive the doubling of Sub-Saharan Africa’s human population in the next 50 years, is naïve.

Future training of game department staff must emphasize sociology/anthropology, management, monitoring and extension. Uniformed paramilitary trained game guards, who see peripheral communities as the enemy, must be replaced by minimally uniformed wildlife extension agents, ideally recruited from the communities. In essence, wildlife must be seen as a renewable economic resource, just as soil in agriculture, only instead of agricultural extension agents, wildlife/natural resource extension agents will work with rural communities to manage and valorize wildlife and other resources where they have a comparative economic and ecological advantage over farming (e.g., most of the savannas that constitute 70-75% of the land mass in Sub-Saharan Africa and many of the tropical lowland hardwood forests – see Chapter 5). If this paradigm shift occurs, communities will hire their own force to police wildlife and likely do a better job at less cost than government. The ultimate goal is to take marginal agricultural land and use it as an economic resource, transforming what would yield US\$ 7/ha in small stock raising to US\$ 8/ha in game ranching to US\$ 30/ha in multi-faceted high-end ecotourism (e.g., trophy hunting and luxury tourism) (Child, *et al.*, 2004b *In:* Child, B. 2004a). Thus, conservation becomes an incentive led business, “conservation is really about getting the most value out of resources without damaging them” through monitoring in order to assure ecological

sustainability and biodiversity, with the majority of benefits accruing to society (Child, B., 2004a), especially the rural poor peripheral communities.

“On the other hand, one cannot assume that once an area is under indigenous ownership and control the problem is solved and that all indigenous systems of land use are inherently sustainable. This is patently not the case. Indeed many indigenous communities are fully aware of the fact that as pressure on their lands from outside intensifies and as their own economies and social organization change to accommodate their increasing involvement in the market economy, they need to elaborate new mechanisms to control and use their resources. Ecologists, social scientists, lawyers and development advisers may have relevant knowledge to contribute to such indigenous communities to help them achieve this transition. Their role, however, is to act as advisers to indigenous managers rather than directors of indigenous ventures” (Colchester, 1994) (see Chapter 9, Section 9.7.5, Lack of Technical and Management Skills).

Makuleke Contractual Park

In light of the above, de la Harpe, *et al.*, (2004 *In:* Child, B., 2004a) question the relevance of the IUCN classification of parks and protected areas to Sub-Saharan Africa. Ultimately, this means Categories II and VI above will to some degree merge, parks possibly having smaller core protected areas, while as with the Makuleke Community in South Africa (see Chapter 9, Section, 9.6.3.7, Makuleke Contractual Park, South Africa), large portions of the national parks will have to be “de-gazetted” as some form of contractual park that allows multiple use, but not conversion, to agriculture and/or livestock.

Multiple Use in Pilanesberg and Madikwe Parks – Need to Integrate People

Pilanesberg and Madikwe parks, Northwest Parks Board, South Africa, are already being managed for both high end tourism, trophy hunting and game

capture, though there is still some question of how much of the profits/turnover are being captured by the peripheral communities; believed to be very little. Pilanesberg also allows the collection of firewood by communities. According to the Boruakgom Farmers Association and Lorimer and Associates Ecotourism Consultants (2004),

“conservation areas within the membership of the Boruakgom Farmers Association were created as early as 1987. The concept of the Madikwe Conservancy was tabled at meetings of the association many years before the creation of the Madikwe Game Reserve. Bop (Bophuthatswana) Parks followed this example in 1992 and used members of the association in the planning and promotion of the idea of a game reserve. Madikwe was to be developed for the benefit of all the people living in this area. Madikwe Game Reserve was to be created to be a peoples park, developed, first, as a conservancy or conservation area, where the needs of local people came before those of conservation and wildlife. Local people were to be fully involved in the planning and development of this game reserve where 40% of gross income⁴⁰² was to be used for community upliftment. This has never happened. These and many other promises made by the North West Parks and Tourism Board have not been kept and a climate of mistrust now exists between Madikwe Game Reserve and many of its neighbors living in the North West Province”.

Magome, Grossman, Fakir and Stowell (2000) provide an excellent historical perspective on how the 47,000 ha Madikwe Park went from white-owned to black-owned cattle ranches and then into a park. Lack of land tenure rights by the Madikwe community is a major weakness in their being able to bargain for an appropriate share of the benefits from this venture. In fact, the state has taken ownership.

⁴⁰² Also In: Davies, Trieloff and Wells (1997)

11.11 CASE STUDIES, USE OF FOREIGN ASSISTANCE TO IMPOSE WESTERN PRESERVATION PHILOSOPHIES ON RURAL AFRICANS

11.11.1 Western Urban Preservationist Biases Imposed on Rural Guineans

Fairhead and Leach (2003) give two examples of Western preservationist biases imposed on rural resource-dependent Africans: 1) At a 1999 meeting to establish a “Prefectoral Federation of Forestry Groups” in Kissidougou, Guinea-Conakry, with facilitation by the EU funded Niger River Protection Project, resulted in Western biases being concluded - village anxieties over state intrusion into their autonomous management of traditional village forests were not voiced/brought out. Village reports, as an outcome of this meeting, did not envision timber exploitation then, or in the future, by village “Forestry Groups (*Groupements Forestiers*)” with forest preservation favored over exploitation being institutionalized in the federation – while on-the-ground forest exploitation would be a reality and 2) A 1999 Conservation International (CI) West African workshop on biodiversity was framed in such a way that national representatives could voice neither their own or land users’ concerns. The program director concluded that due to the “time bomb” and the recurring theme of “nature for nature’s sake”, the matter was too urgent for the niceties of community involvement. This was in conflict with Guinean delegates, who saw biodiversity within the context of its use, community meetings around national park planning and creation of biodiversity plans, including resource users such as traditional hunters and herbalists. Fairhead and Leach (2003) believe even Guinea-Conakry’s approach was not all inclusive, failing to identify and involve groups such as charcoal-makers, commercial hunters and bushmeat traders, giving one the impression that subsistence use was okay, but maybe not commercial use – often a theme pushed by Western conservationists, as though only Westerners have the

right to earn income from natural resources, while rural Africans have only the right to subsist. Such exclusion failed to obtain the knowledge and perception of these stakeholders or to acknowledge that they must become a critical part of resource management plans, as these two commercial uses will not be stopped due to the tremendous urban demand for both charcoal and bushmeat in West Africa.

11.11.2 Donor Driven Conservation, Lake Mburo National Park (LMNP), Uganda

“The main beneficiaries of conservation at LMNP - and of its increased likelihood because of the CC (community conservation) initiative - are international and Ugandan conservationists, the Ugandan conservation bureaucracy, donor agencies and foreign tourists and visitors. In the extreme, a case could be made that LMNP is a well-disguised form of ‘quiet violence’ that provides benefits to a small national and international elite (and tens of millions of couch potato conservationists worried about African wildlife) while making the livelihoods of tens of thousands of rural Ugandans poorer: ensuring that some have no supper, some have no schooling and some remain unemployed or underemployed! In theory the Park, along with the rest of the country’s conservation estate, is for ‘the people of Uganda’ both present and future. In practice fieldwork indicated that the priorities of local people place a high value on environmental changes that the Uganda Wildlife Authority (UWA) and conservationists would regard as environmental degradation...Is community conservation a means by which we direct marginal additional benefits to local communities and talk of ‘participation’ while avoiding the fundamental question of who bears the costs of conservation in Africa? If it is, then this is to be deplored. If it is not, then we should be aware of the long term outcome: that eventually communities will define what ‘conservation’ is rather than national and international elites. For the Lake Mburo region, at least, this will be a fundamentally different definition, based on natural resource sustainability, images of the landscape and opportunities for tourism, rather than the biodiversity criteria that have been pursued at LMNP to date” (Hulme, 1997).

11.11.2.1 Historical background

Traditionally, Uganda's parks and reserves were established during the colonial era with a "Sherwood Forest Approach" in which they were set aside as exclusion zones (that is, exclusion of local residents) to the benefit of the Crown. These areas, especially parks and game reserves, were for the most part, initially established and managed by dedicated professionals coming out of a strong military background. They were run as a paramilitary operation with a warden and his heavily armed rangers pitted against the enemy (the local people) who were told in no uncertain terms that to cross into the protected area's boundaries without express permission from the authorities could mean severe punishment. This paramilitary culture is still evident today in the newly formed Uganda Wildlife Authority (UWA) (Hulme, 1997) and, in fact, most wildlife authorities across Sub-Saharan Africa.

For example, community relations with park authorities grew so bad that even as late as the 1970s, park personnel working in the lodges at Murchison Falls National Park were confined to the lodge grounds for fear of attack if discovered by locals walking along the road. Lodge employees even feared being poisoned and thus, did not even frequent local villages or towns, eating all of their meals on park grounds. In those days, there was a shoot to kill policy for anyone found within Murchison Falls National Park. Many people who innocently wandered across park boundaries are believed to have been shot or incarcerated with little cause (Ogwang & DeGeorges, 1992).

The dominant ethnic group from the Lake Mburo area is the Banyankole, which can be divided into two sub-groups, the Bahima and Bawiru (see Chapter 2, Section 2.3.2, Pasture and Water and Chapter 11, Section 11.6.6.2, Uganda, democracy, civil war and attempts to find an African solution). The Bahima were traditional pastoralists of long-horned Ankole cattle, while the Bawiru were

cultivators. Today both grow crops like bananas, beans, maize and cassava (Averbeck, 2001).

Similar to Tanzania and Kenya, Lake Mburo's cattle and wildlife populations in the 1890s were hit by a series of events, as described in Chapter three, which reduced human and cattle numbers in favor of wildlife. By the 1930s, the colonial administration declared the area a Game Control Area (GCA) with regulated hunting. By the 1940s, bush encroachment (likely from over-grazing), and possibly protection (no harvesting of firewood/charcoal) and fire suppression by colonial administrators, resulted in tsetse fly invasion and an abandonment of the area by humans and their cattle to avoid sleeping sickness. In the 1950s/60s, a tsetse fly eradication program involved mechanical bush removal, spraying of insecticides and shooting game. This resulted in the opening up of the bush and a dramatic reduction in game populations. Eventually, the GCA was converted into a Controlled Hunting Area (CHA) (Hulme, 1997). Over the course of the 20th century, and following the eradication of tsetse-flies from the area, the Bahima increasingly moved their herds into areas adjacent to Lake Mburo (Averbeck, 2001).

At the end of the colonial era, the Lake Mburo CHA was converted into the 648 km² (250 mi²) Lake Mburo Game Reserve (LMGR), which allowed the 241 families judged to be 'resident' in LMGR, to remain in the area and to cultivate around their homesteads (Hulme, 1997). It also served as a strategic area for livestock due to the availability of dry season water and grazing. Bahima pastoralists communally managed much of the area outside of the game reserve. It was re-gazetted as a national park under the Obote regime in 1983.

In 1963, USAID sponsored a tsetse fly eradication program (Ogwang & DeGeorges, 1992) followed by the Masaka/Ankole Ranching Schemes (Ogwang

& DeGeorges, 1992; Lamprey, Buhanga & Omoding, 2003), to privatize and divide up land around the game reserve into ranches for beef and milk production. The total area of the Ankole Ranching Scheme was 648 km² (250 mi²), broken up into fifty 1,295 ha (5 mi²/3,200 acres) ranches. The hope was that the Bahima cattle keepers of Ankole would abandon traditional attitudes of extensive pasture management and self-sufficiency. The government subsidized the construction of fencing and installed two valley tanks in each ranch, helped design and plan layouts of ranches and establishments, maintained feeder roads and fire breaks and covered the cost of cattle dip construction materials, fencing materials, water tanks and pipes. Ranchers received free land and a variety of ranch-related services at virtually no cost. The main objective was rapid and radical development of intensive land and animal husbandry practices, producing beef and milk to satisfy internal demands and surplus for export (Ogwang & DeGeorges, 1992).

This scheme was advertised in the newspaper. The only requirements to obtain lease titles to these ranches were: 1) Literacy, 2) 200 head of cattle and 3) 200 USH (a lot of money in those days). This excluded illiterate and penniless Bahima pastoralists, the very people that the schemes were meant to help (Ogwang & DeGeorges, 1992).

“Ranch units in the schemes were allocated to educated elite in the best position to apply for them, whilst the majority of poor and uneducated pastoralists were alienated from these large areas” (Lamprey, *et al.*, 2003).

As a result, these ranching schemes marginalized pastoral people, leaving them without alternative grazing land. Many, along with there large numbers of livestock, were made landless. These landless pastoralists struggled to settle with their herds as squatters in Lake Mburo Game Reserve, in forest reserves, in other

game reserves and on government sponsored ranching schemes (Ogwang & DeGeorges, 1992; Lamprey, *et al.*, 2003).

Though, legislatively not legal, The Game Department gave a number of these landless pastoralists permits to graze their cattle within the gazetted limits of the Lake Mburo Game Reserve. Unfortunately, the permit did not limit the number of people and as the extended families grew, so did the number of livestock (Drani, *pers. comm. In:* Ogwang & DeGeorges, 1992).

In 1977, Lake Mburo Game Reserve contained 159 families. Plans existed to resettle them on the eastern boundary of the reserve, but the set aside 39 km² (15 mi²) area was given to another group.

The pastoralists remained until 1983 when they were forced out at gunpoint when the game reserve was gazetted a national park. Herders returned with a vengeance, as the then Obote Government fell apart in 1985, ransacking and destroying most of the park facilities and infrastructure as a demonstration of their disdain for such an institution (Ogwang & DeGeorges, 1992). It is no wonder that they sought revenge since when expelled, huts were set on fire, cattle chased into the bush, people were physically abused and there were reports of killings (Hulme, 1997).

This history is not unique to Lake Mburo National Park, but typifies the troubled relationships and conflicts that have existed between parks and people since their inception throughout Sub-Saharan Africa and much of the colonized world. The net results of relocation are traumatic (see Chapter 7, Section 7.10.1, Dam Impacts on Displacement of People). Colchester (1994) gives a number of examples, citing that of the Kibale Game Corridor, linking Kibale Forest to Queen Elizabeth National Park, where 30,000 people were removed against their will.

'We were chased out on the first day. I didn't know anything was happening until the police ran into my compound. They all had guns. They shouted at me, told me to run. I had no chance to say anything. They came at us and we ran, they came so violently. I was frightened for the children - I had 8 children with me - but we just ran off in all directions. I took my way and the children took theirs. Other people were running, panicking, even picking up the wrong children in the confusion. I lost everything. I had 31 cows and some goats and hens. They were killed - 20 cows were killed and the rest taken. They burned everything, even the bed and furniture and the kitchen. We're poor now.' " (Joy Ngoboka, evicted from the Kibale Game Corridor, Uganda, 1 April 1992 cited in Feeney, 1993 *In: Colchester*, 1994).

Shortly after the evictions the EC's chief technical adviser reported that: "'This successful operation...has opened up the possibility of the frustrated elephant population of Kibale once more being free to migrate between the Queen Elizabeth National Park and the forest...' " (cited in Feeney, 1993 *In: Colchester*, 1994).

In 1986, with the establishment of a new government, people took advantage of lawlessness and the lack of management to come back in Lake Mburo Park as squatters on the ranches and in the park. Immediately, opportunists came in from other areas and people and livestock numbers increased. These squatters refused to leave the ranches and there were reported fights with ranch owners (Drani, *pers. comm.* *In: Ogwang & DeGeorges*, 1992). They invited hunters to shoot the wildlife out ("revenge killing"), thinking that the government would not want to reserve land for wild animals and if they killed all the game, the government would abandon the idea of a reserve/park in favor of agriculture and livestock (Hulme, 1997).

Because of the controversy, the Government decided to leave pastoralists alone until the problem of landlessness could be resolved. All private ranch leases

were suspended and the Ranch Restructuring Board established to determine how to resettle these pastoralists on the ranches.

As of December 1992, Lake Mburo had 20,000 illegal resident cattle (Drani, *pers. comm.* In: Ogwang & DeGeorges, 1992). It is estimated that during the dry season up to 80,000 cattle grazed within the park (Ogwang & DeGeorges, 1992; Infield,⁴⁰³ *pers comm.* In: Hulme, 1997). The number of cattle does not seem to have changed significantly (see Table 11.12).

Table 11.12: Game population estimates for the Lake Mburo ecosystem, 1992-2002

	1992 (a)	Dec. '95	May '96	Oct. '97	May '98	Feb. '99	July 2002
Huts	8611	7,068	5,435	6,130	6,552	6,730	5,795
Cattle	65,243	110,304	124,695	58,969	98,483	80,298	66,609
Sheep/ goats	11,026	7,259	7,594	7,819	10,199	9,601	13,019
Kraals	1,792	1,066	1,088	1,457	874	1,156	944
Impala	18,691(b)	6,599	7,442	6,817	4,124	1,595	2,956
Zebra	3,446	2,430	1,574	3,254	3,748	2,249	2,665
Eland	N/a	273	88	285	1,442	199	28
Warthog	N/a	571	480	964	559	550	493
Topi	N/a	57	111	362	81	183	271
Buffalo	N/a	25	105			486	132
Hippo	N/a	51	76			303	97
Waterbuck	N/a	241	287	485	427	598	396

Note: "Estimates below the bold line (Zebra) are only broadly indicative, and should not be used for comparison, as populations are low, extremely aggregated, or inconspicuous, and the systematic reconnaissance flight (SRF) technique cannot yield accurate results" (Lamprey, *et al.*, 2003).

Note: (a) SRF Fixed wing aerial survey techniques for all data (Averbeck, 2001). According to Averbeck (2001), 1992 survey area much larger ($2,010 \text{ km}^2$) than in other years ($1,513\text{-}1,573 \text{ km}^2$), though this alone should have not been cause for the large differences. One major difference is the 1992 survey was undertaken by Olivier, while all other surveys were undertaken in which Lamprey was involved (Averbeck, 2001 & Lamprey, *et al.*, 2003). (b) Averbeck (2001) shows 16,185 impala for 1992 by same surveyor.

Source: Lamprey, *et al.* (2003, Table 2.3) with permission, IFPRI.

⁴⁰³ Mark Infield, CTA, AWF Project, early 1990s, Lake Mburo National Park, Uganda.

The carrying capacity of the Ankole Ranches is about 1,200 cattle/5 mi² (3,200 acres or 13 km²/1,300 ha) ranch, or about 60,000 cattle per the 250 mi² (160,000 acres or 648 km²/64,750 ha) ranching scheme (Jingu, *pers comm.* In: Ogwang & DeGeorges, 1992). The veterinary department recommended a stocking rate of about half or 625 cows/5 mi² ranch (Ogwang & DeGeorges, 1992).

Prior to about 1982, there were about 32,000 cattle on ranches by land owners/tenants. Over the last ten years (1982-1992), 42,000 cattle were brought in by opportunists, amounting to a total of about 74,000 cattle or about 14,000 cattle beyond carrying capacity (Drani, *pers. comm.* In: Ogwang & DeGeorges, 1992), 34,000 if the veterinary department's estimate is correct.

In 1987/88 it was decided as a compromise, to reduce the park from 648 to 259 km² (250 to 100 mi²). Of the de-gazetted 389 km² (150 mi²), 311 km² (120 mi²) were allocated to pastoralists around the national park and 78 km² (30 mi²) allocated to the Kanyayeru Resettlement Scheme along the northwestern border of the park. This resettlement scheme consisted of 600 families from the war torn Luwero District. They were expected to cultivate even though they were traditionally pastoralists and the land was unsuitable for crop production (Ogwang & DeGeorges, 1992).

"The Ranch Restructuring Board has completed some of the modalities of sub-dividing the ranches, including which ranches are squatted and how subdivision is to take place...The issue of squatters has yet to be resolved. This is a very sensitive issue, as Government guidelines require that resettled communities are provided with land and facilities to re-establish themselves. However, little land is now available, and resources are in short supply" (Lamprey, *et al.*, 2003).

In the early 1990s, the African Wildlife Foundation (AWF) *de facto* ran Lake Mburo Park with donor money (Ogwang & DeGeorges, 1992). The Chief

Technical Officer, Mark Infield, was trying to do a good job under a very difficult situation. By 1995, the last of the squatters were moved out of the park, this time through negotiation instead of force through a Community Conservation Unit (CCU) consisting of a Community Conservation Warden and three rangers (Hulme, 1997).

11.11.2.2 Competition for other land uses

Despite donor support and the achievements of the 1990s, Lake Mburo National Park's (LMNP) faces severe financial and land use challenges. The current resource use of LMNP is a substantial drain on Uganda's economy, with its major economic benefits from a minor tourist industry, fishing and the poaching of wildlife. The park has habitat suitable for rain-fed farming, swamps that could be agriculturally productive if drained and some land that could produce "premium" crops such as coffee, along with a large remaining area suitable for cattle grazing. The total agricultural potential of the park is estimated between US\$ 42.7 and US\$ 103.9 million/year. Lake Mburo National Park also acts as a barrier to north-south and east-west communications and trade in the Mbarara District (Hulme, 1997). Similarly, Lamprey, *et al.* (2003) demonstrate the difficulty of wildlife competing with agriculture around Lake Mburo (Table 11.13).

Clearly, sport hunting generates a much smaller revenue per unit of land area than mixed agriculture, but where livestock production is the primary land use it may increase revenues/ha by about 30%. Thus, returns from hunting may be significant if landowners continue with livestock production and forgo cultivation (Lamprey, *et al.*, 2003).

Table 11.13: Revenues from different forms of landuse, Lake Mburo

	UShs/ha/year	US\$/ha/yr
Mixed agriculture	506,500	329
Livestock production	10,500	7
Illegal hunting (unsustainable offtake)¹	6,500	4
Sport hunting as currently practiced²	3,000	2

Notes:

- 1: Extrapolated from Emerton, 1999a *In: Lamprey, et al.* (2003), on assumption that this is ‘lost opportunity’ within LMNP, that the ‘huntable area’ is 130 km², and that similar wildlife densities exist outside in the ranches.
- 2: Based on current sport hunting concession on ranches 46-50 only (75 sq. km.)
3. USH 1,539/\$US Averbeck (2001)

Extracted: Lamprey, et al. (2003, Table 4.6) with permission IFPRI.

Like most parks in Uganda, Lake Mburo National Park operates on a self-financing basis from total income, which for 1996 was UShs 102,945,000 (US\$ 97,580) from 8,365 tourists, mostly day trips providing little added value. This income must cover salaries, road maintenance, revenue sharing and most transport costs must be met: an operation run on a shoestring. The lack of charismatic species in the Park makes it difficult for LMNP to expand into the lucrative foreign tourist market, putting into question the economic viability of the park. Of this income, 20% of the gate fees go to community development (US\$ 19,516) supplemented by donor money. With 80,000 peripheral community members and 1,800 key households (Hulme, 1997)⁴⁰⁴, this comes out to US\$ 10.84/household, typical of household benefits described in Chapter nine (see Section, 9.7.6.4 CBNRM will not create a “middleclass” in rural Africa) – and this is assuming most of the income is from gate fees, since the majority of tourists are day

⁴⁰⁴ Note: Emerton (1999a) estimated about 51,000 people and 7,500 households around Lake Mburo National Park.

visitors. Community small enterprise income generating projects faced a lack of demand, poor management, leadership disputes, a lack of motivation and commitment (Table 11.14).

Table 11.14: Projects financed by the support for community-initiated projects (SCIP) fund and their achievements, Lake Mburo National Park, Uganda				
Project	Main Activities	Size SCIP Committee	% SCIP Committee Members	Status
-Rwentango Dispensary	-Rebuilding sub-dispensary	9	100	Successful
-Birunduma School	-Rebuilding primary school	7	100	Successful
-Sanga School	-Roofing primary school	5	20	Unsuccessful
-Karugaju Aid Post	-Rebuilding sub-dispensary	5	0	Doubtful
-Rwenikinju School	-Rebuilding primary school	7	0	Doubtful
-Kamuli Traditional Healer	-Building facilities for a traditional healer	7	29	Successful (still operating)
-Kakagatu Tree Nursery	-Raising tree seedlings	35	100	Unsuccessful
-Kakagatu Bee Farm	-Honey production	n/k	n/k	Unsuccessful
-Rwabarata Bee Farm	-Honey production	28	100	Doubtful
-Joyce's Tree Nursery	-Raising tree seedlings	1	100	Successful
-Rwabarata Women's Group	-Tree nursery, bakery and handicrafts	28	4	Unsuccessful
-Rwakukuku Women's Group	-Handicrafts	n/k	n/k	Unsuccessful
-Paulo's Live Fence	-Bwara fence to stop wild animals	2	100	Successful
-Godiano's Live Fence	-Bwara fence to stop wild animals	1	0	Unsuccessful
-Valley tank digging	-Well and tank digging	n/k	n/k	Successful
-Sanga Road	-Maintenance of road	n/k	n/k	Successful

Source: Hulme (1997) with permission, IDPM.

11.11.2.3 Attempts at collaboration between park management and peripheral community

The Chief Park Warden established a Wildlife Committee of Resistance Committee/Council (RC) chairmen to discuss wildlife/livestock issues and a Fishing Committee, consisting of the Rwonyo Fish Landing and Rwamuhku Village, to address access rights to and management of Lake Mburo's fishery resources (Ogwang & DeGeorges, 1992).

Under pressure from USAID, the establishment of Park Management Advisory Committees (PMACs) met a Uganda National Park obligation, as opposed to being driven by demand from park neighbors. In Lake Mburo National Park, the PMACs functioning has been sporadic and limited (Hulme, 1997). “PMAC has thus largely failed the communities’ need for an institution that can adequately represent their concerns to park authorities” (Barrow, *et al.*, 2000). Barrow, *et al.* (2000) explain with regard to PMACs, Parish Resource Management Committees (PRMCs) or Local Conservation Committees (LCCs),

“The duplication of functions and the failure of PRMCs and PMAC to interact effectively with local government structures has led to the proposal that PRMCs should be replaced by a sectoral committee of local government, a combined Production and Environment Committee. This committee would be responsible for direct interaction with the protected area management on issues affecting parish communities”.

One must ask how many of these institutions come from the communities versus institutions, as noted above, imposed on rural people by outsiders and doomed to failure without taking into account traditional and/or existing institutions to whom the local communities can relate.

Emerton (1999a) estimates that less than 10% of the peripheral population of Lake Mburo National Park benefits from access to its resources. Using data from Emerton (1999a), this is calculated to be US\$ 132/household for 750 out of 7500 households that included grazing, hunting, medicine, firewood, polewood, thatch, weaving material, honey and papyrus.⁴⁰⁵ Benefits from fishing were separated out from this figure.

11.11.2.4 Fishing

A major threat to the park is in-migration by subsistence farmers, increasing livestock numbers to meet demands of a growing dairy industry and commercial crops, especially bananas. The human population is growing at a rate greater than the national growth rate of 2.8/year (Note, based upon latest data 2.9/year, see Section 9.6.1.2, Kifluku Farm, Laikipia, Kenya). Due to the potential agricultural land use within LMNP, there is growing pressure - both by legal and illegal means - to see the park converted to these land uses (Hulme, 1997).

Since the mid-1990s, there has been a focus on the sharing of the Park's natural resources with the local community - with initiatives in fisheries, papyrus harvesting for mat-making, traditional medicines and cattle access to LMNP water resources during periods of drought.

Fishing pressure was controlled by the number of canoes limited to 40, a limit on the number of nets and mesh size. The problem will be for these communities to arrive at a negotiated solution to controlling and sharing this resource. People from the fishing camp and from Kiribwa Village (both herders and cultivators interviewed) seemed ready and willing to collaborate with the park staff to establish a management plan for the park. Representatives from the fishing camp and park headquarters shared places on the RC1 Committee. Fishermen have been elected as

⁴⁰⁵ Emerton (1999a) estimates USH 143.4 million/year or US\$ 98,556/year, based on a conversion rate in 1999 of USH 1,455/US\$ impacting 750 out of 7,500 households.

the RC1 treasurer, secretary and youth head. Kiribwa Village is already selecting RC's to send their views and to begin negotiating with the Park (Ogwang & DeGeorges, 1992).

“Fishing villages are prohibited from being established around Lake Mburo. However, the Rwonyo Fish Landing, near park headquarters is a consolidation of the former fishing villages around the lake. It contains 5 permanent families and 25 temporary fishermen with a total population of about 100” (Ogwang & DeGeorges, 1992).

In 1994, 56 boats landed fish valued at UShs 43,025,946 (about US\$ 40,800). This amounts to US\$ 728/boat or US\$ 364/fishermen, assuming two fishermen/boat. Community relations with park officials have improved as a result of these efforts (Hulme, 1997). In 1997, fishing generated “\$US 48,000, or an average of nearly \$US 1,500 per canoe (implies 32 canoes). Of this total, net income of approximately \$US 41,400 accrued to local residents - 18 of the canoes are operated by UWA staff, and various fees and levies are paid by fishermen - divided 60:40 between license holders or boat owners and fishermen” (Barrow, *et al.*, 2000).

11.11.2.5 Grazing in park

“Lake Mburo National Park is the only non-forest park to make use of MOUs (Memorandum of Understanding) in working with communities. In a process undertaken by the Community Conservation Warden with minimal external assistance, an MOU was negotiated with two community groups to provide their livestock seasonal access to permanent water sources through the park. The Parish Resource Management Committees (PRMCs) played an important role in negotiating the agreement, and were signatories of the MOU. The MOU specified who was allowed access, the number of cattle, and what the responsibilities of the community members were for the implementation of the agreement” (Barrow, *et al.*, 2000).

A cattle corridor has been created and 47 herders with 2,233 cattle were allowed to water their livestock, especially from the Kanyayeru Resettlement Scheme, with the understanding that Parish Resource Management Committees (PRMCs) would develop watering points outside the park. As noted above, Park staff believed these rights were abused (Hulme, 1997).

“Though the process was interesting, and important for UWA in that it extended the principle of resource access from forest to savannah parks for the first time, it has not been a great success. Both community members and park staff have allowed large numbers of users who were not part of the agreement and did not require access to water, to illegally use the corridor for accessing grazing. This led to two problems: households moved into the communities so that they can be included in the access agreement; and households listed in the agreement brought in cattle belonging to people from other communities. It would appear that the motivation for these distortions in the agreement was for community members to gain access to an additional resource not covered by the agreement, in this case grazing. In the case of this agreement, it seems clear that communities have not accepted the responsibility given to them under the agreement. This may be because they perceived the park authorities as being weak, or because they accepted the agreement under duress. High levels of corruption amongst park staff also undermined the agreements” (Barrow, *et al.*, 2000).

The limited use of pasture and no use of timber, poles, medicinal plants or firewood (other than the collection of dead wood for fish-smoking) in LMNP, has resulted in the peripheral community losing access to significant resources. Barrow, *et al.* (2000) estimate that communities still experience a net income loss of US\$ 400,000 from forgoing the exploitation of various natural resources in the park, especially from fishing, hunting and wood products – in essence rural communities are subsidizing conservation. Similarly, Emerton (1999a *In:* Roe &

Jack, 2001) estimates this net loss from foregoing access to resources as UShs 528 million (US\$ 362,887)/year.⁴⁰⁶

11.11.2.6 Poaching

Poaching of wildlife is also an issue, from organized commercial poaching, to subsistence hunting, to ‘revenge’ killing of animals (Hulme, 1997). Another problem is illegal meat hunting that might be considered a form of game cropping, if legalized could be controlled and sustainable with benefits accruing to individuals, a major failure of CBNRM, with most benefits being communal and not contributing to livelihoods.

“It is estimated that as many as 10,000 Impala were taken off private lands around Lake Mburo National Park in a 5 year period (2,000 impala/year) (Lamprey & Mitchelmore, 1996 *In: Barrow, et al.*, 2000). The value of these Impala, approximately \$US 300,000 (US\$ 30/impala), mostly went to a few individuals, including corrupt members of the Game Department. Communities certainly received some share of this value, and also gained access to the meat itself. With the merger of the Game Department and Uganda National Parks in 1996 to form the Uganda Wildlife Authority (UWA), and the accompanying legislation that allows for the granting of use rights, it is reasonable to expect that community benefits from wildlife resources outside protected areas will increase, and may help reduce illegal hunting” (Barrow, *et al.*, 2000).

Hulme (1997) estimates that between 600 and 2,000 impala/year, an estimated 11% offtake (can sustainably harvest about 20% of the annual population), are poached from the greater Lake Mburo area, with bushmeat values of US\$ 27,000 to US\$ 140,000/year depending on values/kg employed. Given poaching of other game, the total annual illegal harvest for bushmeat is valued at about US\$ 150,000 (Hulme, 1997). This implies a population of between about 5,500-18,000

⁴⁰⁶ 1,455 UShs./ US\$ in 1999

impala. Depending on the number of poachers, assuming 100-200, this amounts to between US\$ 750-1,500/hunter.

Never-the-less, there is no reason why such numbers could not be harvested legally and sustainably within the park complex, generating, as with fishing, relatively significant income at the household level.

Averbeck (2001), on the other hand, claims poaching combined with natural deaths is exceeding the annual growth rate of the impala population, causing it to decrease. Her estimates show a decline of impala from 6,599 to about 3,000 in the Lake Mburo area between 1995 and 1999, using fixed-wing aerial surveys using the same method, same pilot and observers (constant error). The latter count of 3,000 impala in February, 1999 was increased from 1,595 to correct for undercounting verified by ground counts that resulted from impala taking cover due to high temperatures (Table 11.12). It should be noted that ground counts and one aerial survey, conducted between 1986 and 1993, showed a range of from 10,993-16,185 impala (Averbeck, 2001).

In the Kruger Park, Bothma, Peel, Petit and Grossman (1990), determined for impala, aerial surveys with a fixed wing aircraft under-estimated the total population by 52-55% and with helicopter between 34 and 64%, compared to a drive count using 59 students as a means of obtaining a total count. If one used these adjustments for undercounting, other than for the February 1999 count that is low, this would put the estimated numbers closer to the earlier ground count numbers. However, estimates of population based on the ground counts might be considered of questionable accuracy, as they covered less than 1.5% to 2% of the survey area (Averbeck, 2001), which many would consider inadequate coverage to have statistically viable data. Lamprey's aerial surveys covered a much more acceptable 11.5% to 17% of the survey area (Averbeck, 2001).

Richard Lamprey (2004a) contends, regardless of the numbers, his counts from 1995 onwards, based on using the same methodology, using the systematic reconnaissance flight (SRF) technique, a method which relies on counting within a systematically obtained sample (Norton-Griffiths, 1978) and having a constant error, show that trends in impala numbers are decreasing and this should be of concern.

“The pastoralists on whose land the wild animals reside perceive them as a problem, and have encouraged local hunting groups to eliminate them. The human-wildlife conflicts are a serious management challenge to local communities, local governments at sub-county and district level and park management” (Lamprey, *et al.*, 2003).

However, if game cropping⁴⁰⁷ is to become a possible management tool, where populations are harvested at near annual replacement rates, then as accurate a figure as possible of the annual population is needed using the latest aerial survey techniques, such as distance sampling, to minimize the likelihood of over-harvesting. If a mistake is made, trend data may pick this up, allowing corrections to be made from which the impala may quickly recover.

The other real problem is that because most of the offtake is clandestine and not monitored, the exact numbers being harvested are unknown, making management decisions difficult. Local hunters need to be brought on board and linked into a systematic program that monitors harvests.

Sixty percent (60%) of the people interviewed in the area hunted and most desired to see local hunting legalized and controlled, since under current conditions

⁴⁰⁷Cropping is the sustainable harvest of meat, skins and other by-products from a game population for economic purposes.

government could not control poaching. Most hunted medium and small game with traditional weapons (nets/dogs/spears, snares, pits, bow and arrow), while only 4% used guns which would allow the taking of large game. With hunting illegal and most people seeing no benefits from wildlife, most did not mind having wildlife in the park, but did not want it as a competitor on their land. The majority saw all wildlife as a problem animal and thus supported poachers coming on their land to eliminate them (Averbeck, 2001).

11.11.2.7 Pilot impala harvesting program

A pilot impala game cropping program was initiated in the vicinity of the park on what appears to be a private ranch. Impala carcasses were sold at US\$ 13 each and tanned skins at US\$ 26/skin. This amounts to US\$ 39 gross/impala. Of this, the community received US\$ 1,100 for 100 impala or US\$ 11/impala (Averbeck, 2001).

Two-thirds (67%) of the impala live outside of the park on ranches in the east and north of the park. It was estimated that 369 impala (123/month over a three month period) for the entire population or 250 on the ranches, could be sustainably harvested/year over a three month period from a 1999 population estimated at 3,370, which includes population growth for that year (Averbeck, 2001); a conservative 11% offtake. Averbeck (2001) estimated an illegal offtake in 1998 of 1,500 impala.

Ultimately, Averbeck (2001) estimated that “considering the investments, the culling of 200 impala might generate less than a net⁴⁰⁸ income of US\$ 8,000 which is financially not viable” due to the small, but limited resource base of the Lake Mburo area. On the other hand, Lamprey, *et al.* (2003) estimate the

⁴⁰⁸ This appears more like a gross value.

possibility of generating a total of US\$ 46,453/year from the game cropping of all wildlife in the Lake Mburo complex. The basic lessons learned from the game cropping experiment were as follows (Lamprey, *et al.*, 2003):

- “Wild animal populations in the country are still too low to allow economical game cropping.
- Meat and skin prices were not sufficiently high to out-compete prices of ‘poached’ meat.
- There is a lack of sufficient scientific data on which to base management decisions (e.g., in deciding quotas, seasons for game cropping, etc”.

Lamprey, *et al.* (2003) found that those ranches with squatters and no title, saw little tangible benefit when revenues were spread amongst many people. On ranches with clear ownership and title, landowners started to support law enforcement programs by reporting illegal activities to park management. This appears, once again, to be the problem. The squatted ranches are analogous to CBNRM programs where the stakeholders are so many that benefits are few/person or head of household. While ranches, with one or a few owners, as game ranches in southern Africa, receive proportionally much higher benefits/individual or household, even if the total amount of money to distribute is the same. Thus, in squatter ranches, poaching benefits individuals with more rewards per those individuals - poachers - than through a communal system of distribution. Land and resource tenure on squatted ranches is also likely a key issue as all over Sub-Saharan Africa.

The culling option has been dropped in favor of a pilot trophy hunting program. The study recommended multiple use of wildlife to maximize economic benefits from added value (Averbeck, 2001) as occurs in South Africa (Table 11.15) including:

- Trophy hunting;
- Processing of skins with hairs on in Uganda;
- Marketing and advertising of game cropping products (e.g., meat, skin, by-products); and
- Furthermore, it should streamline the processes of setting quotas and licenses in time.

Table 11.15: Multiple use of wildlife maximizes profit, South Africa, 2005/2006		
Types Of Business:	Gross Profit US\$/Rand	Percent
Game, all uses	US\$ 670,857,143/ R 4,696 million	100
Recreational/Biltong	US\$ 443 million/R 3,100 million	66
Hunting		
Taxidermy	US\$ 28.6 million/R200 million	4
Overseas Trophy Hunting	US\$ 72.9 million/R 510 million	11
Live Animal Sales	US\$ 13.4 million/R 94 million	2
Meat Production	US\$ 6 million/R42 million	1
Translocation	US\$ 107 million/R 750 million	16
Note: ≈R7/1 US\$		
Source: NAMC (2006) with permission, The National Agricultural Marketing Council (NAMC), South Africa.		

11.11.2.8 Pilot hunting scheme

In 2001, a one-year pilot sport hunting project was initiated by a private investor, Game Trails (U) Ltd., in collaboration with a community-based organization – Rurambira Wildlife Society (RWS), consisting of ranches number 46-50, whose main objectives were to (Lamprey, *et al.*, 2003):

- Provide incentives to landowners to manage and protect wildlife on their land by giving wildlife a greater economic value;

- Contribute towards the reduction of crop damage caused by problem animals and vermin; and
- Provide lessons to guide UWA in proposing sport hunting as a conservation concept;

The trophy hunting quota was determined based on a 2-3% offtake of the total population estimate. Game Trails had a joint venture with Zwilling Safaris.⁴⁰⁹

The RWS received 65% of the game (trophy) fees, 5% of the trophy fee went to the Nyakashashara sub-county, 5% to the Community - Protected Area - Institution (CPI): the body (committee) established under UWA policy to act as the link between the protected area and the sub-counties and 25% to the UWA (Lamprey, *et al.*, 2003). The private sector would evidently keep the daily rate, which Booth (2000 *In:* Averbeck, 2001) estimated to be US\$ 81,900, while Lamprey, *et al.* (2003) estimated this would be US\$ 63,000. The following income was derived by the community in the 2001/2002 hunting season (Lamprey, *et al.*, 2003) (Table 11.16).

A 2002 survey showed an apparent increase in impala numbers compared to previous data (Table 11.12), implying that the hunting scheme probably helped decrease poaching (Lamprey, *et al.*, 2003). However, as noted above, Averbeck, (2001) adjusted the 1999 number of impala to 3,000 to account for the time of day and the high temperatures which would have caused a decrease in sightings with impala herds taking refuge in the shade under trees. Has there really been an increase in impala numbers in so short a time (one year)? It is doubtful that one small pilot hunting program on only five ranches, out of what appears to be 60-70 ranches, with limited beneficiaries in such a short amount of time can change the

⁴⁰⁹ The owner of Zwilling Safaris, Peter Pichler, an Austrian died in an automobile accident in 2004 after the hunt of Gerhard Damm (*pers. comm.*), P.O. Box 411 - Rivonia 2128 - South Africa, Tel: +27-(0)11-883-2299 Fax: +27-(0)11-784-2074, email: gerhard@muskwa.co.za

attitude of the entire community towards wildlife to the point that it would result in a significant increase in impala numbers.

Table 11.16: Quota utilization and game fee revenues for the Lake Mburo pilot sport hunting scheme in 2001/2002

Common name	Quota approved	Unit price 'game fee' (\$US)	No. utilized	Potential animals utilized	Potential revenue (\$US)	Potential revenue to community (\$US)	Actual revenue (\$US)	Actual revenue to community (\$US)*
Baboon	15	90	0	1,350	1,013	0	0	0
Buffalo	10	600	6	6,000	4,500	3,600	2,700	
Bushbuck	10	250	7	2,500	1,875	1,750	1,313	
Bushpig	15	150	0	2,250	1,688	0	0	
Duiker	4	130	1	520	390	130	98	
Eland	7	500	5	3,500	2,625	2,500	1,875	
Hippo	6	500	2	3,000	2,250	1,000	750	
Impala	50	250	10	12,500	9,375	2,500	1,875	
Oribi	6	150	6	900	675	900	675	
Reedbuck	5	250	4	1,250	938	1,000	750	
Topi	4	350	4	1,400	1,050	1,400	1,050	
Warthog	14	250	9	3,500	2,625	2,250	1,688	
Waterbuck	10	500	6	5,000	3,750	3,000	2,250	
Zebra	31	500	2	15,500	11,625	1,000	750	
Total	187			59,170	44,378	21,030	15,773	

Note*: revenues to communities include to Rurambira Wildlife Society, to the sub-county and to the CPI. This is equivalent to 75% of the game fees.

Source: Lamprey, et al. (2003, Table 4.5) with permission, IFPRI.

It can be argued that if sport hunting is the primary goal of the management program and not game cropping or traditional hunting, estimates of total numbers are not needed since only 2-5% of the population will be harvested for trophies. More cost effective indices such as trophy quality, hunter success and observations of the professional hunter, game scout or community on herd structure and size, recruitment and movement, may be more appropriate for much of Sub-Saharan Africa, including Lake Mburo, unless outside donor money is available. The moment that game cropping and/or traditional meat hunting are brought into the management of an area where offtakes may be much higher

approaching annual growth rates, aerial surveys –with modern “distance sampling” would be advisable at least every three years if money is available.

The Game Trails contract with the Ugandan Wildlife Authority has just been extended for another three years, with plans to open another pilot hunting program around Kabwoya Wildlife Reserve in Hoima with plans to slowly expand to start hunting projects in areas that have high wild animal populations like Luweero, Nakaso-ngola and Mubende. No hunting will be allowed in national parks (Wasike & Tenywa, 2004) and, it is assumed, key game reserves (see Section 11.7.3.2, Eco-welfare Uganda, 2002).

The long-term success of this program will depend on the quality of the trophies and hunter success. Gerhard Damm (2004) hunted the Lake Mburo area in 2004. He saw no shootable buffalo, took some good trophy impala and Defassa waterbuck. Zebra were plentiful. There was strong evidence of illegal charcoal making, with burning all over the place. Some poaching from outsiders was observed. They found a speared bushbuck. Game guards in his camp apprehended three poachers, who came in via dugout canoes, and then shot the poachers’ eight dogs.

Damm (2004) made the following observations regarding the quality of the wildlife and its competition with livestock:

- Herd of about 40 buffalo. Buffalo, coexist with cattle, live in dense bush and close, to swamps, difficult to hunt, trophy quality poor and seem to be over-hunted with non-sustainable quota. Did not see any shootable bull (on quota);
- No lion though, all have been poisoned long ago;

- Impala high density coexisting with cattle, trophy quality excellent (on quota).
- Topi, medium to low density, coexisting with cattle, trophy quality representative (on quota);
- Waterbuck, medium density coexisting with cattle, trophy quality excellent (on quota);
- Eland saw about 150, coexisting with cattle, trophy quality low (bulls not bigger than 33 inch) (on quota);
- Klipspringer, saw a few, (not on quota);
- Duiker, saw a few, (on quota);
- Leopard, saw one, tracks of others (not on quota);
- Bushbuck, seem to be abundant, trophy quality excellent, obviously two subspecies of different color variation; one reddish with longer horns, about 17 inch for reasonable trophy and one grayish with shorter horns about 15 inch for a good trophy, (on quota);
- Bohor Reedbuck, saw a few there should be some good trophies (not on quota).
- Warthog, rather abundant, good trophy quality (on quota);
- Bushpig, very abundant, (on quota);
- Sitatunga, saw signs and picked up a horn, (not on quota);
- Zebra, very abundant, high density, too many, black/white no shadow stripes, (on quota);
- Oribi, saw a few, average, (on quota); and
- Hippo, did not see, but are there. Shot as crop raiders (on quota).

Ogwang and DeGeorges (1992) noted regarding buffalo populations that

"Due to over-grazing, primarily by livestock within the park, the make-up of the grasslands has been significantly modified from nutritious grasslands dominated by:

- *Themeda triandra*;
- *Hyparrhenia filipendula*; and
- *Sporobolus pyramidalis*.

to the less nutritious and less palatable *Brachiaria decumbens*. While Impala, Zebra, oribi and duiker will eat *Brachiaria decumbens*, buffalo will not. This may be one of the primary reasons why buffalo are among the most reduced of all the game in the park. Buffalo are sensitive to high human/cattle disturbance. While Bahima tolerate most wildlife species (except predators), they are negative in their attitudes towards buffalo. It has also been found that because overgrazed areas neither shade out nor provide the hot fires necessary to control its abundance, Acacia spp. takes over in these areas (bush encroachment). Acacia appears to have a symbiotic relationship, favoring the shade tolerant *Brachiaria decumbens* over other grasses (Guard, *pers. comm.* In: Ogwang & DeGeorges, 1992). Also, low value lemon grass, *Cymbopogon afronardus* is taking over in some areas, especially on ranches around the park".

Based on the above information, it is unclear about how successful this hunting operation will be until it produces quality buffalo, which will be the flagship money-making species that will attract high-paying overseas hunters. This appears to be a transition area, with Cape buffalo, while lacking Nile buffalo and most of the other "Nile" species found around Queen Elizabeth National Park and other western Ugandan savanna parks and reserves, such as Murchison Falls (see Chapter 9, Section 9.6.3.9, Community fisheries management, Queen Elizabeth National Park, Uganda). According to Damm (*pers. comm.*),⁴¹⁰ the waterbuck here is the Defassa, replacing the common waterbuck of East Africa, while the

⁴¹⁰Gerhard Damm, P.O. Box 411 - Rivonia 2128 - South Africa, Tel: +27-(0)11-883-2299 Fax: +27-(0)11-784-2074, email: gerhard@muskwa.co.za

East African impala has yet to be replaced by the Ugandan Kob of western Uganda. Thus, this area is also not the ideal spot to attract specialty hunters after the unique species of western Uganda.

“The issues and lessons arising from the pilot sport hunting scheme include the following (Lamprey, *et al.*, 2003):

- If owners of private land can realize economic value from wildlife, they develop a positive attitude towards conserving it.
- Given the complexity of the hunting issue, and the criteria for issuing a hunting WUR (Wildlife User Rights), it is unlikely that landowners themselves can obtain hunting rights for their own land. Instead, individual operators may obtain the WUR, and then apply to hunt on other peoples land.
- The hunting company has a real incentive to ensure that the wildlife population remains at a viable level for them to hunt. They therefore have introduced anti-poaching patrols in the ranch areas, and these are proving to be effective in curbing poaching.
- Sport hunters are not interested in species that are ‘problem animals’. No client has wanted to shoot baboons or bushpigs. Sport hunting will not be useful for Problem Animal Control (PAC).
- The operational area of the scheme is still small; the majority of the residents feel neglected and discriminated against. However, the scheme can only be introduced in areas where wildlife remains.
- Mechanisms for sharing revenues amongst landowners are not yet in place. The Rurambira Wildlife Society has instead used revenues for general community projects (e.g., schools).
- The roles of the districts (Rakai and Mbarara) and community PA (Protected Area) institution in the management of the project have not yet been clearly defined”.

A key question that must be asked is how much more can this quota be increased if the hunting was expanded to all the ranches? If one compares the populations of key species in Tables 11.12 and 11.16, assuming a 2% offtake of the annual population for trophies, there is limited room for currently expanding trophy

hunting in the area if trophy quality is to be maintained. Likewise, there is a problem if revenue from trophy hunting of US\$ 15,773 were split among individual heads of household on the 60-70 ranches, many of which are communal or full of squatters. The amount becomes insignificant.

When Dr. Lamprey was queried as to what benefits from hunting meant at the level of household, he responded with what is being observed over and over again in CBNRM-type programs based on the very narrow use of the resources; trophy hunting:

“I am not sure how many households are in the Rurambira scheme, the UWA report from which the data came does not say. I can try to find out - possibly from the 1999 census, which goes down to parish level. Also note that there are many in Rurambira who are squatters on ranches, and have no land of their own. So are they valid beneficiaries? My guess is that each household will be able to buy a couple of bananas for what they actually get annually from the hunting scheme, and that a bit of illegal hunting is far more profitable” (Lamprey, 2004b).

As discussed in Chapter nine, in most cases CBNRM has little impact at the level of households, whereas if one would allow individuals to access a variety of natural resources on a controlled and managed basis, there would be more of an impact on household incomes. Thus, if one combines fishing, traditional hunting, grazing of livestock, wood and other products, plus trophy hunting, there is no reason why these areas cannot be managed for multiple uses, maximizing the income to local residents. “Specialists” from various families would likely access these resources, as within most African communities there is a division of labor, though this would have to be negotiated by all stakeholders. In the long run, it may be the only way to save many of Africa’s natural areas. Certainly, CBNRM, as currently practiced, with an emphasis on trophy hunting, is not the solution.

There is no reason that the remaining ranches, many with squatters, should change their attitudes towards wildlife. Nor is there reason to think that this small percentage of ranches benefiting would be able to stop the other ranches with no benefits from allowing entrepreneurial “poachers” to hunt on those disadvantaged ranches, unless they are all brought into the management of the Lake Mburo complex. Certainly helping a small percentage of landowners will not endear sport hunting and conservation to the remaining residents of the greater Lake Mburo area.

Furthermore, the amount could be significantly increased if the community formed its own safari company and could keep the daily rate, working through a booking agent who might keep 15% of this rate. Even then, while it may be fine for an individually owned company, how significant would this be for a community at the household level, even if one could triple/quadruple the income by cutting out the middleman? Once again, very likely not very significant, though it could serve as a catalyst for development of the area and to provide educational scholarships for youth from the area (see Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders).

Community conservation at LMNP has been based on a “passive participation” approach also called “protected area outreach”. The ultimate challenge for community conservation in Uganda will be whether the Uganda Wildlife Authority (UWA), which encompasses the old Uganda National Parks and the Game Department) funds it as a core activity when donors withdraw, or whether it is treated as a donor-financed “luxury” that will be abandoned when the aid flows stop (Hulme, 1997) with a return to an easier-to-implement paramilitary approach which separates people from their resources. This will be an issue for all of

Uganda's protected areas, not just Lake Mburo. Barrow, *et al.* (2000), raise similar concerns,

"UWA's failure to invest in community conservation is of concern, as it makes the sustainability of many donor funded initiatives uncertain. Consistency of approach is critical to successful community conservation, and this is only likely to come about if UWA clearly makes community conservation part of its program, and provides an operational budget for it, both at headquarters level and within the individual protected areas".

Some key points to be observed here are that: 1) Ecotourism, unless the area is very unique, often does not generate significant income given the demands of peripheral communities and even park management, 2) Using the park or game reserve as a "Living Factory" has a better chance of providing a multitude of income generating activities which, when all of the income is combined, may begin to be significant. This could include traditional hunting, trophy hunting; culling; fishing, livestock grazing, charcoal making, timber harvesting and medicinal plant harvesting among others; 3) A short-coming of most CBNRM programs is that they tend to favor a very narrow focused use of the resource through safari hunting and ignore the entrepreneurial skills of individuals such as fishermen and traditional hunters (so called "poachers"), etc. If there is a failure to integrate these resource users into the formal management of a protected area, then sustainable use, using adaptive management techniques, will be impossible since the resource manager will be unable to monitor the offtake, judge the consequences to the harvested population (be it fish, trees, wildlife or medicinal plants) and then adjust offtake quotas to assure both economic and ecological sustainability. This is a major weakness in most CBNRM projects; 4) Unless resource use can be maximized from many protected areas, with or without the support of the parks and wildlife departments, communities will likely opt out of natural systems in favor of agricultural systems, 5) If wildlife and its habitat is to

have a chance of surviving, the majority of the benefits must accrue to the landholders/community as opposed to the government and private sector who can be economic partners and 6) In some instances, possibly in the case of Lake Mburo National Park, agricultural systems in the long-run may out-compete natural systems.

Given the current wave of poverty in Africa, with populations expected to increase about three times in the 21st century, it would be wise to identify natural systems that can pay for themselves and work with communities to maximize benefits both at a communal and individual level. It is no use fighting a losing battle. In certain incidences, such as areas of unique biological diversity, beauty or cultural heritage, it may prove worthwhile to the global, national or local communities to preserve certain natural environments regardless of the cost. These areas also need identifying.

11.11.3 Rwenzori Mountains National Park - A Success Story of Rural People Managing a Natural Area, and then Foreign Aid and NGOs Arrived

Until USAID forced Uganda to declare the area a national park, and then funded WWF to move into the Rwenzori Mountains, “the Mountains of the Moon”, a model Stage 4 CBNRM program existed or “Conservation by the People” (see Chapter 9, Section 9.8, THE WAY FORWARD – CONSERVATION BY THE PEOPLE – STAGE 4 EQUALS DEVOLUTION). Even USAID-funded auditors were impressed with the Rwenzori Mountaineering Services (RMS) accounting records and with how transparent they were. RMS is an indigenous backpacking and mountaineering tourism company. Sadly, it was USAID who helped jump-start this program and then, in the principal author’s opinion, stepped in and derailed it.

Up until about 1991, when gazetted as a park, the Rwenzori Mountains "Mountains of the Moon" were managed as a forest reserve. For the most part, there was little active management of this forest, with the exception of some pit-sawing permits given out by the Forestry Department.

11.11.3.1 Indigenous controls

For the most part, the protection and the development of the Rwenzori Mountains can be tied to their ruggedness and inaccessibility, but most importantly to the integral link between the Bakonjo people and these mountains, both from the standpoint of resource use (firewood, timber/pit-sawing, gathering of honey, fiber for handicrafts, medicine, food, trout fishing, hunting, etc.) and culture (much of their folklore revolves around the "Old Man of the Mountain" and his son the "One Legged Shepherd", to whom sacrifices must be made prior to the hunt. It is believed that this program can be considered a success story in conservation and development because (Ogwang & DeGeorges, 1992):

- Ownership and Implementation was in control of the local Bakonjo Community;
- Initially, external financing was introduced from the outside, only to jump start the process, but with minimal interference from Western donors and NGOs;
- Community was allowed to make its own decisions and mistakes and learn from this experience;
- Sustainability came from income generated from the resource base; ecotourism in the Mountains of the Moon; and
- All income stayed within the community, including employment and development.

One factor in their favor is that this community goes back a number of generations acting as guides into these mountains under the colonial Uganda Mountaineering Club. Constraints include:

- Declaring the area a park, which by the 1953 Parks Act made this an exclusion zone;
- Beginning to impose Western NGOs on the local people once a park was declared; WWF; and
- Negative Impact on Giant Heath Forests as source of firewood – and need to walk-in alternative energy sources from the outside;

11.11.3.2 RMNP, ecological setting

The 99,600 ha Rwenzori Mountain National Park includes Africa's third highest peak (Margherita, 5,109 meters) with a further 25 of the peaks above 4, 500 meters. Of the 278 woody plant taxa found in the afro-alpine zone, 81% are endemic to east Africa and 19% are found only in the afro-alpine belt (UNEP, 2004). Decreasing temperatures with increasing altitude has resulted in a marked zoning of vegetation which is of great interest to scientists and a delight to visitors. These zones may be summarized as follows (Yeoman, 1989; Yeoman, Tinidigarukayo & Aryamanya-Mugisha, 1990 both *In: Ogwang & DeGeorges, 1992*):

- Below 2,100 meters (7,000 ft) the Forest Reserve Boundary): steep foothills with cultivation and fire induced poor quality grassland subject to soil erosion and reduced fertility;
- 2,100 to 2,400 meters: Mixed broad-leaved and *Podocarpus montane* rain forest of moderate height of 24-31 m (80-100 ft);

- 2,400 to 3,000 meters: a zone in which either *Mimulopsis elliotiae* (a straggling semi-shrub) or bamboo dominate or a mixture of the two;
- 3,000 to 3,800 meters: giant tree heathers (*Phillipia* spp.) carrying aerial epiphytic gardens of outstanding botanical and aesthetic interest, some of which are unique to Rwenzori only;
- 3,800 to 4,500 meters: Climax types of giant lobelia (*Lobelia bequaertii*) and giant groundsel (*Senecio johnstonii* subsp.) that demonstrate the extraordinary phenomenon of afro-alpine gigantism. This is a response to a diurnal regime of intense daily insolation alternating with night freezing. These gigantic species are to a great extent the hallmark of the Rwenzori “Africa's botanical big game”. In this zone *Alchemilla* spp., *Carex runssoroensis* (in bogs) and other tussock grasses provide much of the ground cover, while Everlasting flowers (*Helichrysum* spp.) cover immense expanses of the mountain sides; and
- Above about 4,500 meters (the approximate permanent snow line): the nival zone carries diminishing hardy vegetation which is progressively miniaturized until the permanent ice fields are reached, with the highest point of Mt. Stanley at 5,100 meters (16,700 ft). Unique massive ice-rime sculptures surpass the beauty of equivalent zones of Mt. Kenya and Kilimanjaro.

The park contains at least 89 species of forest birds (27% of the country's total), four species of diurnal primates and 15 species of butterflies (22% of the country's total). Although none are unique to the Rwenzori, many are endemic to the Albertine Rift region and a high level of sub-specific endemism occurs, including the Rwenzori colobus monkey, hyrax and leopard. Although in low numbers, globally threatened species in the park include: elephant (*Loxodonta africana*), chimpanzee (*Pan troglodytes*) and l'hoests monkey (*Cercopithecus l'hoesti*) (UNEP, 2004).

Runoff from Rwenzori enters into Lake Edwards and Lake George, flows into the Semliki River, Lake Albert and then the White Nile River System. In addition to its unique biological diversity, other values include flood control, indirectly lake fisheries, hydropower, reliable permanent headwater for the Nile River, plains irrigation, potable water and tourism.

11.11.3.3 Rwenzori Mountaineering Services (RMS)

Up until about 1991, when the first park warden was placed at park headquarters in Ibanda, the real developer of these mountains was the Rwenzori Mountaineering Services (RMS), an indigenous Bakonjo NGO that had been receiving support from USAID since 1987 through PL-480 (Food for Peace) local currency. This entirely indigenous-based operation guides hikers and alpinists on expeditions into the “Mountains of the Moon”. Since this was a community business, there was close cooperation and a vested interest by everyone in developing the business and in protecting the Rwenzori Mountains. Farmers in the area had sold their lands to RMS, who in return donated this land, situated between RMS headquarters and the national park boundary, as a site for the Rwenzori Mountains National Park headquarters. As of 1992, RMS had undertaken the following activities (Ogwang & DeGeorges, 1992):

- Employed 22 permanent staff, 63 guides/porters who did piece work and 100 laborers helping in construction and renovation of headquarters and trail shelters (4 -5), pit latrines and garbage pits. These people were drawn from four sub-counties and many families;
- Construction of RMS and Parks Headquarters;
- Construction of a dispensary, with some money from the German Government;

- Expansion of the Rwenzori High School. The community made the bricks and RMS helped in hauling sand, cement and provided tin roofing, nails and timber. The school and its grounds are quite impressive;
- Construction of a hotel/restaurant next to headquarters;
- Providing land for park headquarters; and
- About seven camping shelters strategically located throughout the park, each about a day's walk apart.

The RMS had an office in the town of Kasese. You can arrive with the clothes on your back. The RMS will find you winter clothes from the overseas used-clothes market, gumboots and food. They will transport you to Ibanda, the foothills and the gateway to the Mountains of the Moon, lodge you and organize porters, cooks and guides. Thus, they provide door-to-door service as outfitters into these mountains. Even if you desire to climb the glaciers, they have crampons and all the other mountaineering gear you may require. In 1991, 1,400 visitors climbed, experiencing the natural beauties and unique culture of these mountains. Unfortunately, in the late 1990s and early 2000s, instability and rebel movements along Uganda's borders, including the Rwenzoris, have kept tourists from coming.

Based upon extensive interviews with the inhabitants of the Rwenzori Mountains (Yeoman, Tinidigarukayo & Aryamanya-Mugisha, 1990 *In:* Ogwang & DeGeorges, 1992), the following was recommended:

1. Core Zone of 483 km² in upper reaches of mountains with unique biocoenoses (specialized and characteristic associations of plants) and high levels of endemism be transferred from the Forest Department to National Parks as a “core area” (Note: this is in the flavor of a biosphere

reserve). An inselberg or biogeographical island with significant number of endemic fauna and flora. This would be a protected area.

2. Balance of the Forest Reserve (513 km^2), which contains 80% of the conventional forests of interest to foresters, should remain as a Central Forest Reserve under the Forest Department functioning as a buffer zone. The lower area could be used for subsistence and other economic purposes.

Unfortunately, pressure from the U.S. Government and Western NGOs resulted in the entire area being declared a national park and an exclusion zone. Regardless, according to a Cabinet Memorandum, “Creation of a new National Park will not interfere with local interests (e.g., Movements of people, wood and bamboo cutting, hunting, etc”. (Yeoman, Tinidigarukayo & Aryamanya- Mugisha, 1990 *In: Ogwang & DeGeorges, 1992*).

Indecisiveness by the parks Board of Trustees over the above issue led to confusion and became the root cause for growing friction between Rwenzori Mountains National Park (RMNP) staff, and the local community and the Rwenzori Mountaineering Services (RMS).

Upon the arrival of the study team⁴¹¹, the RMNP Chief Park Warden⁴¹² called a meeting of his staff, the Rwenzori Mountaineering Services (RMS), the local Resistance Committee/Council (RC) chairmen, RC1, RC2 and RC3⁴¹³ from Bugoye Sub-County, and the Chief Technical Advisor⁴¹⁴ from the USAID/WWF-

⁴¹¹ Author was part of team along with David Abura Ogwang, Chief Planner, Ministry of Wildlife and Tourism, P.O. Box 4241, Kampala, Uganda in 1992 - today manages the GEF funds.

⁴¹² Alfred Labongo.

⁴¹³ Tom Ruwerza, RC1, Buyoye; C. Kule, RC2, Information, Ibanda; B. Muhongy, RC3 Chairman, Bugoye Sub-county.

⁴¹⁴ Earl P. Clere, Technical Advisor, Rwenzori Mountains Conservation and Development Project, WWF-US.

U.S. Rwenzori Mountains Conservation and Development Project. The Chairman of the Rwenzori Mountaineering Services (RMS), Bwambale M. Johnson, explained that there was a lot of confusion and conflict over how to use the park. The Secretary of RMS, Mwanamwolho M. Stanley, explained that these mountains have been seen as government land since the colonial days, when gazetted as a forest reserve. The Secretary of the RMS explained,

“ ‘Now the Chief Park Warden has come in and is giving out orders such as ‘Don’t do this or that’, locals can’t go into the park, only tourists—the old colonial line! People have no idea of what a national park is, nor an understanding of park policies other than antiquated 1953 colonial park laws which don’t make sense in 1992’ ” (Ogwang & DeGeorges, 1992).

They had always wanted a park, but, as described above, with an upper core protected area reserved for tourism and a lower multiple-use area for extraction of resources by community members. What the Bakonjo people needed to know was (Ogwang & DeGeorges, 1992):

- How could they effectively manage “Their” natural resources? Even though recognized as government land because of economic and cultural ties, the Bakonjo will always feel that the Rwenzori Mountains and its resources are theirs. This is the type of sentiment that all conservation projects should strive for among the local people if they are to be considered a success.
- For a long, time boundaries were forgotten during the civil strife, yet the people still respected the integrity of the forest. The boundaries need to be re-demarcated.
- People needed to be allowed to undertake traditional activities necessary to subsist, for cultural purposes or to gain a livelihood including, but not limited to: firewood, honey, fibre for handicrafts, trout fishing, hunting,

pit-sawing and medicine – that would mainly occur in the lower proposed multiple use area.

Plus, RMS should continue being allowed to guide people. Leaders from the community told the warden that if he did not collaborate with them, he would be sent back to Kampala, an empowerment given them by the new bottom-up government of President Yoweri Kaguta Museveni.

The Chief Warden explained that he feared encroachment in the park by cultivators and livestock. The Bakonjo explained that farms in the upper reaches of the mountains were being abandoned by the youth as their parents died, the youth preferring to be nearer the bright lights and the major thoroughfares of the urban setting. This was a non-issue.

It was explained that park boundaries cannot be realigned, but it would be possible to develop multiple use areas within the park. The USAID/WWF U.S. Chief Technical Advisor explained that at the time there were no serious problems with the park. He hoped that it could be kept this way in the Rwenzoris. He explained how he told the Minister of Environmental Protection, under which his project fell, that policies would come from below and not from above; that is to say from the Bakonjo and the Resistance Committee/Council (RC) chairmen - local government). It would be interesting to return today to see how an area that was a Stage 4 CBNRM program, autonomously run by the local community, turned back into a Stage 3 with a lot of outside interference, has progressed; forwards or backwards? The real question that needs to be asked is did the private-sector not-for-profit community-owned and operated Rwenzori Mountaineering Services (RMS) need some expatriate-NGO holding their hands and wasting what little development money is available in overhead and expensive expatriate salaries, or

some park warden imposing nonsensical bureaucratic requirements on them from antiquated laws? They were doing quite well on their own, thank you.

The only real problem that the principal author observed was the burning of heath forests and other vegetation in the upper core protected area of the park when taking clients on treks. RMS personnel were well aware of this and were making plans to hull up bottled gas and/or firewood.

According to UNEP (2004), traditional uses of forest resources, which were permitted under the former Forest Reserve, have mainly been carried out on a sustainable basis and new agreements have been made respecting these harvesting rights. It is claimed that hunting has stopped possibly due to lack of game.

According to Barrow, *et al.* (2000),

“the process of development of MOUs (Memorandums of Understanding) for forest resource access was carried out with groups representing resource users resident in communities defined by ‘spurs’ (groups living along specific ridges or different sections of the mountains)...UWA is fraught with institutional, structural, organizational and financial problems and constraints which have made this a difficult goal to achieve”.

The agreements were negotiated in a participatory manner and gave management responsibility to the communities. However, two years after being agreed on, the MOUs had not been officially sanctioned by the Uganda Wildlife Authority (UWA) (Barrow, *et al.*, 2000). The WWF East African Programs website shows the following objectives for the Rwenzoris (WWF, 2004a):

“Phase I

1. To assist in the development of policies and regulations, including a park management plan, involving participation of key stakeholders.

2. To reduce the communities' pressure on the park through the identification and promotion of alternative natural resource management activities (Does this mean failed integrated rural development?).
3. To increase the levels of conservation awareness and to improve attitudes of area residents to enable them to make informed decisions regarding sustainable natural resource management.
4. To strengthen local institutional capacity, including decision-making abilities (Park Management Advisory Committees, community-based organizations, etc.) for resource management and development activities.

Phase II

1. To strengthen the capacity of Rwenzori Mountains National Park to effectively manage the park.
2. To reduce human pressures on the park and help meet subsistence resource needs.
3. To strengthen the relations between the park and communities”.

You could take the name of Rwenzori Mountains off these objectives and they would become the generic quick fix for conservation by NGOs all over Sub-Saharan Africa that is ultimately used to impose Western conservation values on other cultures, often impoverishing the people, as many of the case studies in this chapter and Chapter nine have shown. Rhetoric and action are often at opposite ends of the pole.

11.11.4 NGOs and Eco-Colonialism in Bwindi National Park (BINP), Uganda

Bwindi, The 331 km² “Impenetrable Forest” was previously managed as both a forest and gorilla reserve.

“Bwindi is one of the richest afromontane forests in East Africa for birds (350 species) butterflies (310 species), reptiles (51 species) trees (200 species), moths (53 hawk moths and 35 of silk moths species) and the highest diversity of small mammals amongst the

African forests. Bwindi's mammal fauna is also rich; 120 species have been recorded, including 7 species of diurnal primates" (Makombo, 2003).

Bordering Bwindi are some of the richest agricultural lands in Uganda, but among the most populated.

"In 1948 there were 3.7 ha/person while today there are 140-500 persons/km² and an average of only 0.7 ha of land available per person. Formerly steep sloped forested areas are now under intense cultivation" (Ogwang & DeGeorges, 1992).

The human population density on the edge of the park is 200-400 per km², among the highest densities on the continent, resulting in a major out-migration (Wild & Mutebi, 1996). People practice terraced agriculture (see Chapter 5, Section 5.6.1.8, Impacts of colonialism on traditional agriculture in Uganda).

The Forest and Game Departments managed the forests under the Forest and Game Acts of 1964. Bwindi had a Forest Department Working Plan. As a forest reserve, timber exploitation was limited to "restricted species", felled by licensed pit sawyers. The Forest Act of 1964 made provision for the local use of minor forest products. However evaluations in the mid-1980s indicated that pit-sawing (both legal and illegal), gold mining, beekeeping and hunting were out of control (Wild & Mutebi, 1996).

Pit-sawing was the major source of income from the forest and ecologically benign. A single tree is cut, a pit dug, and with a two-man saw - one man on the tree and one in the pit - boards are made on the spot and carried out on foot paths. It is labor intensive and no logging roads are needed which fragment the forest and open it to uncontrolled access, as in Cameroon (see Section 11.11.6.4, Logging companies and the unsustainable bushmeat trade) and the Congo (see

Section 11.11.7.3, Collusion between WCS, CIB and unsustainable logging/conservation). During 1990, evaluations

“stressed the need for local people to gain practical benefits from a zone (buffer) of the forest allocated for multiple-use sustainable extractive activities” (Ogwang & DeGeorges, 1992):

- 37% of population interviewed carried out pit-sawing in the past, the majority being employed by larger contractors;
- 8 % interviewed were employed through timber carrying;
- 13% of respondents produced items for sale from the forest such as baskets, trays, walking sticks, honey, grain stores, carved utensils, stools, furniture, etc.; and
- 69% interviewed had woodlots, but land shortage is the biggest hindrance to expansion.

For the most part recommendations were ignored. One problem the principal author found in the early 1990s was that the local communities alleged

“that pit-sawing permits are issued to rich saw millers, who can afford to pay off those issuing the permits. These millers use their own pit sawyers. The local communities perceive that they fail to derive major benefits from pit-sawing, working primarily as day laborers hand carrying boards from the forest to the benefit of a few relatively far removed entrepreneurs. Most local inhabitants cannot afford the UShs 45,000 to invest in a saw” (DeGeorges, 1990a).

This could easily be overcome by giving exclusive rights for logging only to peripheral communities.

According to Hamilton (1987 *In:* Ogwang & DeGeorges, 1992),

“Conservation of many forests species is likely to be compatible with timber harvesting, especially if this is by pit-sawing...In fact pit-sawing does have some advantages over saw milling, notably in providing more jobs, avoiding much of the disturbance, compaction, and erosion of large areas of topsoil which are associated with saw milling, and quite likely in allowing a higher sustainable harvest of timber...not arguing that sawmilling should be replaced entirely by pit-sawing-only that the Forest Department should reassess its priorities in this area”.

11.11.4.1 Turning Bwindi into a national park, donor/NGO pressures

Rather than working to manage these resources better, with pressure from gorilla researchers such as Tom Butynski and Jane Kalina, and associated Western NGOs,⁴¹⁵ the U.S. Government pressured Bwindi’s designation as a park in 1991, against the desire of the surrounding rural populace, to protect 300 IUCN “Critically Endangered” mountain gorillas (*Gorilla gorilla beringei*). According to Vande weghe (2004), Butynski was against gorilla viewing by tourists, since the benefits to communities were so low compared to the high risk of disease (e.g., bronchial pneumonia and measles) transmitted from humans to gorillas, or even gorillas to man such as herpes. This reluctance to develop gorilla tourism is believed by the principal author to be the primary reason Dr. Butynski was eventually forced out of Bwindi in the early 1990s. Large sums of donor funding, especially from USAID, were funneled to CARE to deal with people outside the forest (DTC – Development Through Conservation Project) and WWF (IFCP – Impenetrable Forest Conservation Project) to deal with issues within the forest. The principal author found the approach of CARE and WWF back in the early 1990s, both amusing and alarming. WWF game guards, dressed in green shirts and hats, carrying rifles, were seen by the community as the “bad guys”, keeping

⁴¹⁵ Tom Butynski and Jane Kalina were working in Bwindi funded by USAID through WWF. Tom and Jane (*pers. comm.*) were against both consumptive use (e.g., pit-sawing) and non-consumptive use (e.g., gorillas tourism). When they had to leave, WCS moved in and established gorilla tourism, since they already had experience in habituating gorillas and tourism in neighboring Rwanda.

them out of the forest. While on-the-farm outside of Bwindi, CARE community game guards were dressed in white hats and white shirts and supposed to be “good guys” helping the community with agro-forestry, living fences, etc., solving most of the developmental problems on the farm (failed integrated rural development – see Section 11.10.6.2, “Conservation and development” a continuation of failed “integrated rural development” linked to “preservation”); almost like a cowboy movie – the good guys wore white hats (Ogwang & DeGeorges, 1992).

11.11.4.2 Reaction of rural people to Bwindi National Park

The 1965 Parks Act prohibited people prohibited from entering the park, an exclusion zone. When Dr. Fred Kayanja, Trustee of the East African Wildlife Society and Vice Chancellor of Mbarara University of Science and Technology, explained to the people that they would be compensated for not being able to use the Park's resources by having schools, clinics and roads built for them, the local community explained, that the forest yielded resources that provided money, though little by our standards, to many heads of families.

As one pit sawyer explained,

“Your schools, clinics and roads are well and good, but they don't fill empty bellies or pay school fees. We want access to the forest” (Ogwang & DeGeorges, 1992).

Wild and Mutebi (1996) site similar reactions from local communities. Bwindi is a fine example of the failure of CBNRM programs to positively impact heads of households, in fact its implementation was making households poorer (see Chapter 9, Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa).

Many villagers and loggers explained that for them the gorillas were another form of human, which they respected and did not poach. Given what they feared then became a reality as all pit-sawing, a major source of rural income, was stopped even though there was little scientific evidence that this means of exploitation was harmful to gorillas or the forest, nor incompatible with ecotourism - providing a more diverse portfolio of resource utilization with greater economic returns (Ogwang & DeGeorges, 1992).

11.11.4.3 Impacts on Bwindi's natural system from excluding people

In fact, in the book *The mountain gorilla: Ecology and behavior* by Schaller (1976), it was suggested that with the disappearance of the forest elephant, some pit-sawing could be beneficial to the gorillas by opening up the forest and providing the luxuriant vegetation they needed for food. What Schaller failed to mention is that until the coming of the European and his 7th century Norman concept of exclusion zones (see Chapter 3), people have always played a pivotal role in determining the ecology of the Impenetrable Forest and most other ecosystems in Sub-Saharan Africa. Now that key mega-fauna are extinct from the forest, a person's role, contradictory to what most people think, becomes that much more critical if the gorilla and its habitat are to survive. Wild and Mutebi (1996) explain,

“At Bwindi the activities of buffalo (now extinct) and elephant (now very few) caused disturbed secondary habitats which gorillas prefer. Secondary vegetation is now common in the forest due to timber harvesting. With better protection the forest is regenerating, and gorilla habitat is likely to decline. The level of plant use (see below – minor forest products) established at BINP is far below the impact needed to maintain secondary habitats at their present extent and causes less vegetation destruction than tourist trails cut daily for gorilla viewing”.

In fact, in many instances, separating people from their natural resources is resulting in decreased biodiversity (Wild & Mutebi, 1996), similar to allowing habitat to evolve to a few climax species by removing fire in savannas (see Chapter 6, Section 6.1.4.4, Bush encroachment versus desertification), and in this case, logging.

Furthermore, “A policy of no use can bring greater risk to an ecosystem where communities depend on the resources. The hostility caused by cutting off these resources can be an extremely risky strategy, as has been proven time and again in recent conservation history. Aggressive protection is vulnerable to failure at ‘crisis points’ when law enforcement fails” (Wild & Mutebi, 1998).

This is the danger faced with the conservation program that does not allow timber harvesting that some ecologists feel would be beneficial to both biodiversity and in providing food and habitat for the gorilla if undertaken in a controlled and sustainable way.

“Under pressure from traditional Western conservationists, who had come to believe that wilderness and human community were incompatible, the Batwa were forcibly expelled from their homeland” (Dowie, 2005).

Excluding Batwa Pygmies from Bwindi without options for alternative livelihoods has been disastrous:

“I am from Nteko, nearby the forest. A long time ago we used to stay in the forest where we used to get everything. We reached the time of seeing people coming and they told us to come out of the forest, that it’s not yours, you go out of it into the open area. We went out and we couldn’t fit in any community. We reached the place and stay there just working for others up to now. We struggle to get the way of surviving. The people who chased us from the forest haven’t given us anything to survive on. We need land and hoe. If they are not ready to help us in that - they are to explain to

us whether they can let us go back to the forest" (*In: Colchester, 2003*).

A land acquisition program for the Batwa Pygmies was begun, but stopped, allegedly due to the poor performance of the Trust Fund in U.S. stock markets (Colchester, 2003) (see Section 11.11.4.4, Benefit sharing).

Retaliation by local people for the creation of Bwindi Park resulted in 16 fires started during a drought following the gazetting of BINP. Roughly 5% of Bwindi Forest burnt, including some areas that had never burnt before. With a boundary of about 115 km and a patrol staff of 24, management of the park without the support of peripheral communities was impossible. During one of the management plan workshops for BINP, one of the community representatives said:

"The reality is, no matter how many rangers you have, you will not be able to control people going into the park. Timber is coming out of the forest even now" (Wild & Mutebi, 1996).

Interestingly enough, prior to Bwindi becoming a park, the forest boundaries, planted in exotic cypress trees, were respected by the local over-populated communities, with one exception where a forest guard had given permission for one group to cut into the forest for agriculture. Given the human population pressure for agricultural land, a forest whose resources are worth little to local people, risks to be encroached on.

11.11.4.4 Benefit sharing

According to Makombo (2003),

“The revenue sharing money, which is usually 20% of the total gate entry collections (mostly for gorilla viewing), is paid to the sub-county local government level in check form and the sub-county administration integrates it into its budget. However, the money goes directly to support projects within the parish that touches the Park as it is the residents of such parishes that bear the costs of Park existence, especially crop damage by animals...So far, Bwindi has supported 19 successful projects around the Park that took a sum of USH 71 million (\$US 71,000) by 1999. More funds (USH. 90,000,000 an equivalent of \$US 52,950)⁴¹⁶ have been disbursed”.

If all of this money is added up, it amounts to only US\$ 123,950 that has gotten to communities in the form of projects since the park’s inception in 1991, or about US\$ 10,329/year over 12 years. This money goes to common property benefits and does not help individual families, a recurring symptom of most CBNRM programs (see Chapter 9).

However, the share of revenue for community benefits from gorilla watching amounts to around US\$ 100,000/year around Bwindi (Clarke, 2001). Based on the figures given above in Makombo (2003), little of this income, maybe 10% is actually even getting to community projects let alone heads of households. A sizeable sum, but had it been shared out between the 80,000 inhabitants of the parishes identified as beneficiaries, each person's share would have been a US\$ 1.25/year (Clarke, 2001; Clarke, 2004), or about US\$ 7.50-12.50/household depending on the average size of each household (e.g., assuming six to ten persons/household).

⁴¹⁶This is quoted – must assume fluctuating exchange rates account for differences in conversion to US\$.

Another benefit is the US\$ 84,000 annually in park staff salaries to people from the neighboring communities. Another US\$ 12,700/year is earned by the communities as guides, especially popular with students during vacation (Makombo, 2003). Numbers of beneficiaries or households impacted positively by employment were not provided. The communities around park headquarters at Buhoma have a guest camp that also raises some money (Makombo, 2003).

Cunningham (1996) provides an excellent review of major and minor forest products from Bwindi, except timber. It appears that some access to non-timber products is being allowed within 20% of the park (Adams & Infield, 1998; Wild & Mutebi, 1996). According to Barrow, *et al.* (2000),

“As part of the statutory process of consulting with communities prior to national park declaration, Uganda National Parks (UNP) was forced to accept that it would continue to allow access to resources by local communities. As a consequence, UNP (Uganda National Parks) responded by developing an informal policy that ‘up to’ 20% of national parks could be subject to extractive resource use. This amounted to a radical departure from national policy, and put Uganda at the most extreme edge of national park management in Africa, where strict, exclusionary management is still generally the order of the day”.

Bushmeat and timber harvesting, though not allowed, could provide major sources of income and the meat could supply an important source of protein if sustainable harvesting programs were developed (Table 11.17).

Table 11.17: Negotiated approval of minor forest products to be harvested by communities from Bwindi National Park

	Allowed	Under Consideration	Not Allowed
Community View	Medicines Basketry Honey Firewood Fruits Stock Watering	Mushrooms Fish Footpaths Gum	Meat Timber Hunting Beanstakes Gold Building Poles
UNP Approved HQ	Medicines Basketry Beekeeping Footpaths	Mushrooms Fruit Fish Stockwatering Gum	Meat Timber Hunting Beanstakes Firewood Gold Building Poles

Source: Wild and Mutebi (1996) with permission © UNESCO / R.G. Wild and J. Mutebi 1996.

For instance, in the Aberdare Forests of nearby Kenya, Emerton (1996, *In: Barrow, et al., 2000*) found household income from the diversified use of the forest resources to be significant (Table 11.18):

Table 11.18: Average annual household value of timber and minor forest products, Aberdare forests, Kenya

PRODUCT	AVERAGE ANNUAL VALUE (\$s)
Timber	14.6
Medicines	43.8
Honey	29.2
Building Materials	51.1
Wild Foods	21.9
Hunting	7.3
Grazing	58.4
Charcoal	29.2
Fuelwood	51.1
TOTAL	305.6

Note: Believed to be US\$ (see below)

Source: Emerton (1996, *In: Barrow, et al., 2000*). Reproduced with permission of IIED, www.iied.org.

Emerton (1997) and Emerton (1999b *In: Roe & Jack, 2001*) found similar issues with trying to manage Mount Kenya's forests as a strictly protected area,

suggesting that its savior in the long run might very well be as an area managed for multiple use with benefits to the community in cash and kind accruing from bushmeat, other wild foods, medicines, poles, grazing, timber, fuel wood, charcoal, building material, and fees from commercial logging among others, being valued at US\$ 300/year/household for 40,000 households in direct livelihood support. In return, the watershed will be preserved, providing water for downstream users from fishermen, hydropower, irrigation, as well as urban and commercial use.

Sithole (2004 *In: Fabricius, et al., 2004*) found non-timber forest products (NTFP), often called minor forest products, as critical to livelihoods in the Mafungautsi State Forest of Zimbabwe, and the need to have easily accessible harvest permits if poaching of these products was to be controlled. As in Bwindi, the most valuable forest resource, timber, was given to outsiders rather than the local people. Shackleton and Shackleton (2004 *In: Fabricius, et al., 2004*) estimate that in South Africa there are 2.4 million rural households of which 76% are in wooded areas with non-timber forest products (NTFPs)/minor forest products, having a potential value of US\$ 450/household/year totaling US\$ 800 million/year. This is an order of magnitude greater than the tourism income derived from South Africa's national parks, and yet there is little attempt to manage and monitor the offtake as a means of assuring sustainability or in determining how to deal with losses if this land is transformed to other uses. NTFPs contributed 28% of the mean share of all households in rural South Africa (Dovie, 2001 *In: Shackleton & Shackleton, 2004 In: Fabricius, et al., 2004*).

Thus, by maximizing the use of the forest resources, one can maximize the income to families, with individual heads of households benefiting from various specialties linked to harvesting these resources.

CARE Development Through Conservation Project (DTC) staff reported a markedly greater enthusiasm for local access for consumptive use within the Uganda Wildlife Authority (UWA) among conservation wardens and rangers than among enforcement wardens and rangers (Adams & Infield, 1998).

The US\$ 4 million Mgahinga and Bwindi Impenetrable Forest Conservation Trust (MBIFCT) has also been established with capital from the Global Environment Facility (GEF) and was invested offshore, being worth US\$ 5.4 million by March 1998. The Board of Trustees includes three local people and representatives from national and international organizations. If the funds were allowed to accumulate unspent until 2002, there would be enough capital to provide US\$ 400,000/year for projects in perpetuity (Adams & Infield, 1998). Sixty percent (60%) of MBIFCT funds support local projects, 20% support work of two Parks administrations and 20% goes towards research through the Institute for Tropical Forest Conservation (Adams & Infield, 1998; Dutki, 2003). This would imply US\$ 240,000/year for communities. However, the market decline since 2000 has reduced the value of MBIFCT's assets from a high of US\$ 7 million to around \$5.5 million today (Dutki, 2003). In a recent paper presented at the World Parks Conference in Durban, little was mentioned of benefits from this fund, except for small grants, giving one the impression that not much is actually going to the rural communities (Makombo, 2003). Dutki (2003) lists common-good projects from the MBIFCT funds like primary school classrooms, health units and rural road construction to individual income-generating activities like fish farming, beekeeping, other agro-based activities – on-the-farm “integrated rural development” solutions, as opposed to sustainable management of forest resources - as well as creation of conservation awareness (environmental education).

The one danger of such funds is that they are a disincentive for governments to sustainably manage their natural resources as a means of economic development. This encourages them to live off “international welfare” and trust funds while impoverishing rural communities that they attempt to entice with “common property” benefits and failed “integrated rural development” continually driven by Western NGOs all over Sub-Saharan Africa in trying to solve all the problems on the farm (see Chapter 5, Section 5.6.3.1, Agricultural bias by donors as solution to Africa’s backwardness – constraint to appropriate land use; Chapter 11, Sections 11.7.10 Agricultural Bias of Foreign Aid by USAID and 11.10.6 Eco-Colonialism - Conservation Driven by Researchers as Opposed to Wildlife/Natural Resource Managers).

Though the following refers to an analysis of Mgahinga (next door to Bwindi), it equally applies to Bwindi. Community support for the park is bought at a steep price through continuous investment in the community conservation program. The goodwill that outside investment buys is directly related to the sustainability of the flow of revenue from First World donors’ “biodiversity agenda” and secondly, the buoyancy of the tourist economy. Turning gorillas into a resource capable of yielding U.S. dollars in quite large quantities is not a magic solution to conservation or local development problems because of competition for those dollars by stakeholders (e.g., government, various factions within the community). The sustainability of tourist revenues as a source of income should not be taken for granted (Adams & Infield, 1998):

- Gorilla tourism is seen as a cash cow to fund Uganda Wildlife Authority (UWA) and to subsidize biodiversity conservation elsewhere that may not be economically viable; and
- Tourist numbers are dependent on political stability in the region.

By 2002, with the insecurity not only along Bwindi's border (civil wars in the Democratic Republic of Congo/Rwanda), but in general along most of its borders, Uganda was receiving only 5,000 tourists/year as opposed to 60,000/year to Murchison Falls Park alone in the 1960s (Speidel, *pers. comm.*). In 1999, tourists visiting Bwindi were killed by rebel groups. Today, the people of Bwindi are poorer than before the creation of the park. This demonstrates the vulnerability of ecotourism as a basis for conservation and development programs in Sub-Saharan Africa. Community conservation based on ecotourism, not only in Bwindi, but all of Uganda, is therefore, far from assured of being self-sustaining.

Because over 70% of the Uganda Wildlife Authority (UWA)'s budget is from Western donor handouts (Kaye, *pers. comm.*), donors and their allied NGOs and their scientists and "developers" have a strong influence over conservation policies, as opposed to the Uganda Wildlife Authority negotiating conservation policies with local communities that will maximize economic and social returns to the community and government while maintaining biodiversity. As noted (Thomson, *pers. comm.*), the animal rights have a major influence over the UWA conservation policy.

Thus, "It remains to be seen whether the very low amount of resource use established at BINP will be sufficient to ensure stable long term relationships between park and community. As one community member put it: 'While we are pleased to be allowed to continue our beekeeping it represents only a quarter of our former benefits from the forest'" (Wild & Mutebi, 1996).

What happens when the donors pull out? Ogwang and DeGeorges (1992) noted,

"If there is a failure to make maximum use of Uganda's forests and parks for economical purposes in non-critical habitat areas, and farmers are only allowed to use the forests and parks for subsistence

needs while solving all of their economic problems on the farm, they will have that much less of an opportunity, through natural resource based rural enterprises, to escape the endless cycle of poverty that is the major cause of environmental destruction in Africa. This concern was brought out as a major issue in the Environmental Policies and Law in Uganda Seminar held in August 1991. On one hand while the government and the ‘World Community’ pushes for rural enterprise development, it is seemingly embarking on potential policies in the name of Conservation (Defined as ‘Sustainable Use’ but often misunderstood to mean protection/no consumptive use of natural resources) which, like the colonial powers, will cut off the rural community from accessing much of the economically valuable wildlands natural resources in Uganda. It must then be asked who are these parks and reserves for, ‘the people’ or the ‘World Environmental Community ?’ If the right policies are implemented, they can be for both, with core protection areas for ecotourism and research, and multi-purpose wildlands buffer areas that can provide subsistence needs and like the protected core be used for income generation through sustainable exploitation. The question that must ultimately be asked is will the newly created Ugandan parks really serve as a model for linking natural resources to development and entry into a moneyed economy in rural areas? Furthermore, there is no economic analysis to determine to what degree tourism alone will provide adequate income to the rural community from various park schemes to offset areas that could be sustainably exploited with minimal impact on biodiversity or ecotourism”.

It is obvious from the above information and that in Chapter nine concerning CBNRM, that tourism alone will not significantly improve the lives of the peripheral communities. However, wise and sustainable exploitation of all resources within the forest can go a long way in improving livelihoods and should include pit-sawing, both to generate income, as well as to improve habitat for gorillas.

11.11.5 Transfrontier Conservation Areas (TFCAs), Southern Africa

The concept of transboundary conservation was developed in the United States 70 years ago (Dzingirai, 2004). In southern Africa, the idea is to develop parks and contiguous protected areas that cross national borders. The idea is that people

with one visa will be able to freely cross national borders as ecotourists, as will game, and local communities will benefit as in CAMPFIRE (see Chapter 9) from tourism, possibly hunting and selling crafts (Dzingirai, 2004). Like CBNRM, this ideological movement is called by many names such as Transboundary Natural Resource Management (TBNRM) paradigm, Transboundary Protected Areas (TBPA), Transboundary Conservation Areas (TBCA), Transfrontier Conservation Areas (TFCAs) and Transboundary Development Areas (TBDA) (Jones, 2003). This process is donor driven (Katere, Hill & Moyo, 2001; Hughes, 2003 both *In: Jones, 2003*) with buy-ins by NGOs as a means of accessing large sums of money (Levine, 2002 *In: Jones, 2002*) under the globalization process where concern for “global commons” has become a driving force (Jones, 2003) encroaching on rural people (Duffy, 2001 *In: Jones, 2003*), resulting in a new form of imperialism (Carruthers, 1997 *In: Griffiths & Robin, 1997 In: Jones, 2003*) on a grander scale than CBNRM. Large amounts of funding will come from Global Environment Facility (GEF) funding (Pavy, *pers. comm.*). A key supporter of CBNRM in the 1980s and early 1990s, USAID in southern Africa made a dramatic switch between 1996 and 1997 from CBNRM in favor of supporting TBNRM as the result of critical reviews over the lack of success with CBNRM and the questioned role of social sciences and community considerations in conservation and biodiversity. They were prepared to support “back to the barriers” conservation in favor of community involvement (Hutton, Adams & Murombedzi, 2005).

The TFCAs movement appears to be CBNRM on steroids with the adverse impacts on rural livelihoods risking to be magnified, talking community, but acting neo-colonial and in the end disenfranchising local people, resulting in deteriorating livelihoods. The State and NGOs seek to establish TFCAs for a number of political reasons; promoting regional peace, pooling resources to overcome economies of scale and consolidation of key ecosystems that cross political

boundaries, including wildlife migration corridors. They are energized by “romantic ideals of recreating Eden and the Myth of Wild Africa” where wildlife roams free, supported by revenue from a Mecca of tourism free of immigration requirements. NGOs get government buy-in and then use their political influence and expertise to fund such programs. These NGOs hold a lot of power due to their access and control over money and their access to power elites within governments (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003).

Jones (2003) raises concern, as demonstrated in Chapter nine on CBNRM, that few benefits will accrue to rural communities due to “the high amount of ‘leakage’ in the tourism industry with a large percentage of earnings, wages and profits remitted/retained away from the area” (DFID, 2002 *In:* Jones, 2003). As in CBNRM, local communities risk to lose further through changing land uses (Duffy, 2001 *In:* Jones, 2003), resulting in loss of access to traditional natural resources on which they depend economically for sustenance and for cultural purposes. Ultimately, these programs bypass working with communities to manage better and sustainably use their natural resources “conservation” in favor of strict ecological interests “preservation”, usurping community benefits (Metcalf, 1999 *In:* Jones, 2003). In other words, it becomes business as usual for the Western conservation movement and Sub-Saharan African elite, centralizing control over land and resources, as during the colonial and postcolonial era, as opposed to devolution. NGOs facilitate the state in usurping traditional land and resource tenure (Duffy, 2001 *In:* Jones, 2003) using the legal system and international donor support.

Dzingirai (2004) argues that

“because transfrontier resource conservation reduces community control and access to natural resources on a larger scale than CBNRM, it is disenfranchisement at large”.

The architects of TFCAs saw a “scale” that is vast areas traversing artificial boundaries where wildlife could move and in which local communities lived as the solution to conservation and community integration and development, when the real issue is decentralization (Dzingirai, 2004) or really devolution of ownership over the land and the resources (see Chapter 9, Section 9.8, THE WAY FORWARD – CONSERVATION BY THE PEOPLE – STAGE 4 EQUALS DEVOLUTION). Recent initiatives in southern Africa include:

- The Great Limpopo Transfrontier Park (Gaza-Kruger-Gonarezhou Transfrontier Conservation Area (TFCA)).
- The Four Corners (Near Victoria Falls where Zimbabwe, Namibia, Zambia and Botswana meet).
- ZIMOZA (Zimbabwe-Zambia-Mozambique Transboundary Area).

The goal by the end of the 21st century is for TFCAs to account for the world’s largest biodiversity zones (Dzingirai, 2004).

Magome and Murombedzi (2003 *In: Adams & Mulligan, 2003*) raise concern over how beneficial TFCAs will be for rural communities, citing concern by the Makuleke that they will lose their Kruger contractual park land and, over the future, of the 20,000 rural poor in Mozambique’s side of the Gaza-Kruger-Gonarezhou TFCA (now called Great Limpopo Transfrontier Park), especially the 6,000 living within Mozambique’s newly proclaimed Limpopo National Park. There is concern that these 6,000 people in Mozambique and the Sengwe Community of Zimbabwe that lie in the corridor linking Kruger and Gonarezhou National Parks, may be relocated (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*). Likely, as during colonial times, and is as all too frequent in Western donor/NGO driven conservation in the 21st century – against the will of

local communities. The conceptualization and agreement in the creation of the Greater Limpopo Transfrontier Park took place without any consultation with local communities, while empowering the state as owner of the land and resources, not the local community – thus no real empowerment (Jones, 2003; Dzingirai, 2004). By 2003, only two workshops had been held with the elected community committee responsible for the five million people living in the area (Wolmer, 2003a *In:* Jones, 2003). Forty percent of the households in the Mozambican portion of the Great Limpopo Transfrontier Park never heard of the TFCA concept and of their involvement (RRP, 2002 *In:* Jones, 2003), resulting in an NGO/donor driven top-down process (Grossman, 2003 *In:* Jones, 2003).

Already, the Mozambican government is using heavy handed repression against local hunters “poachers”, with plans to move the 6,000 residents outside of the park. Plans are to leave residents along the Olifants River alone. The north and south portions of the park will be used for tourist hunting (sport hunting) to generate income for community development and to operate the park, since ecotourism is not expected to be significant (Swanepoel, *pers. comm.*). It is not too hard to speculate which stakeholders will retain the majority of the net benefits from such enterprises. For sure, it will not be the rural populace who will likely experience further marginalization and increased poverty from the TFCA. In essence, TFCAs are forcing rural local people into voiceless partnerships with the state and NGOs backed by Western donor funding (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003).

There is concern that in the to-be-fenced (wildlife in and people out) Sengwe corridor of Zimbabwe, villages will be moved to make way for “Wild Africa” that tourists wish to see, resulting in loss of the most fertile land along rivers, pools and pans critical to both people and livestock, wildlife, forest products such as the liala palm used in handicrafts and community reserve land used for “expanding

households, and strategic relocation as a result of conflict, witchcraft accusations, feuds, and general misunderstanding" (Dzingirai, 2004). Is this not a modern version of what will become overcrowded, impoverished and degraded homelands, a repeat of colonialism in the name of conservation?

Relocating communities onto formerly commercial farms, which the bankrupt Zimbabwean government cannot support (e.g., extension and startup costs), will socially dislocate them from the cross border network of communities who have learned to depend on each other for a flow of resources and commodities necessary for survival in a subsistence economy. Establishment of border posts, an armed bureaucracy and formalization of mobility (customs) may actually impede the fluid movement of local people and resources across borders, central to the livelihoods in this region of southern Africa, and end up as detrimental to the communities. Internal relocation is not an option as land is scarce and this will result in over-grazing and habitat degradation from compression – a symptom of creating parks and protected areas all over the subcontinent, possible fighting over land that becomes a scarcer resource, while requiring communities to give up their current identities and become part of a new community where the relations risk to be subservient (Dzingirai, 2004). Dzingirai (2004) argues that TFCAs disenfranchise

"transfrontier communities by reducing their traditional access and control over resources. It transfers resources, including land upon which community livelihoods are based, to states and private business...the state continues to present transfrontier conservation as being community centered...this repackaging of conservation allows the state to continue its control of natural resources...The rhetoric of transfrontier conservation disguises community exclusion from natural resource management. But if it is disguised control of natural resources, it is one that generates hostility and opposition among communities able to peer through its form".

As discussed in Chapter nine, middlemen (the state, private sector and NGOs living off donor money supposedly to help the local people) will make most of the profits and benefits, while the poor will only get poorer unless there is a paradigm shift in the role of communities in African conservation. Wolmer (2003b) raises most of the concerns discussed above. The jury is still out as to how successful such programs will be if forced on rural communities. In addition, the history of relocations is that people tend to be marginalized on land less rich in renewable resources.

11.11.6 Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas

Along the frontiers of Southeastern Cameroon, Congo Brazzaville and the Central African Republic, a new form of colonization began at the end of the 20th century in an invasion by commercial logging companies, Western conservation NGOs and safari operators linked to the transnational Lake Lobéké/Dzanga-Sangha/Nouabalé-Ndoki “Tri-National De La Sangha” National Park that crosses these three borders. Funded by international donors, Nelson (2003b) calls this vast takeover of traditional territories by Western conservationists, “Corporate Conservation”. The project area overlaps the traditional farming, hunting and gathering lands, supporting thousands of Baka Pygmies and Bantu ethnic groups. There is concern that this is leading to the imposition of new rules affecting access to forest resources on which their livelihoods are based, “concordant with a systematic pattern of community neglect and marginalization observed in the management of other parks in Cameroon” (Nelson, 2003b). Local communities have not been involved in planning for these efforts carried out by national and international elites in isolated capital cities (Nelson, 2003b). The Indigenous Peoples of Africa Coordinating Committee (IPACC) at the 33rd Session of the

African Commission on Human and Peoples' Rights (ACHPR)/Niamey-Niger 15-29 May 2003, have raised concern that conservation and development programs initiated through the

"Congo Basin Initiative, the African Partnership for Forests, the Africa Forest Law Enforcement Group and the New Partnership for Africa's Development (NEPAD), are all likely to intensify this carve up of indigenous peoples' forests into protected areas and logging zones without the rights of indigenous peoples being taken into account" (Colchester, 2003).

11.11.6.1 Introduction

The following case studies in Southeastern Cameroon and northwestern Congo Brazzaville call into question the sustainability of logging and current conservation practices in the biologically diverse dense humid tropical forests of the Congo Basin. After the Amazon, the Congo Basin contains the second largest dense humid tropical forest in the world of about 2 million km². Within this forest, there are approximately 400 mammal species, 655 bird species and 10,000 plant species (Musa, 2006). Most importantly, they not only call into question the future of the Basin's natural resources, but more importantly the unique cultures such as the Baka Pygmies and others who have lived for thousands of years in harmony with the forests, but whose futures are in serious jeopardy.

"These parks were created for white men, who can still hunt in the parks, who can go into the parks and do whatever they want...We didn't even know the parks existed until the authorities started sending our people to prison for hunting. That was when we found out that we couldn't hunt where we used to hunt and that we were not allowed to hunt the wild animals that were killing our livestock. Why didn't anyone ask us what we thought? Then we might not have these problems...I don't know why people think creating a national park (and safari hunting blocks) and making people suffer is a good thing. We had always lived with these animals, and there were no problems until your national parks

came. Did you know that what is now Bénoué National Park used to be the private hunting grounds of the *Lamido de Rey-Bouba* (Fulani ruler) ...we had to make sure people didn't hunt there without his permission...and defaulters were punished by our traditional laws. People were not allowed to hunt certain animals because they were reserved for the chief...While we could not always hunt in the Lamido's hunting ground, we could hunt somewhere else. We had a chief hunter, who had to perform traditional rites to the gods before we could go hunting. He always gave advice on when we could hunt and what not to hunt. People generally had to obey him; those who did not could easily be killed by wild animals" (Njiforti & Tchamba, 1993 *In: Kemf*, 1993).

These were responses elicited from people, mostly Fulani and some Bantu ethnic groups living around Faro (330,000 ha), Benoué (>180,000 ha) and Boubandjida (220,000 ha) national parks, northern Cameroon, in the early 1990s in interviews conducted by the Institute of Animal Research (IRZ) of Cameroon. Surrounding these national parks are about 28 hunting blocks, also off limits to local people. Today, Martin Tchamba⁴¹⁷ is the head of WWF Cameroon, but as will be seen below, 14 years have gone by and nothing has changed. Traditional management systems are being ignored and Western donor funding is being used to disenfranchise, alienate and at worst, destroy local cultures in Cameroon.

"With striking parallels, the same processes endanger nomadic (pastoral and hunter gatherer societies) people all over Africa. The rate and extent of loss vary widely, but the reasons are the same. In almost every case, it is man's tampering with nature that dooms them. The land and animals that supported them are disappearing. Boundaries prevent them from moving on. In the end, their choices are narrowed to one: squat at the side of a road and wait for food relief trucks" (Rosenblum & Williamson, 1987).

⁴¹⁷ Dr. Martin Tchamba, Director of Conservation, World Wide Fund For Nature (WWF), Central African Regional Program Office (CARPO), Panda House, Rue la Citronnelle, BAT Compund, Bastos, P.O. Box 6776 Yaounde, Cameroon, Tel: 237-221-62-67/221-70-83/221.70.84, Fax:237-221-42-40, Mtchamba@wwfcapo.org, www.cameroon.org.

While this concerns the Bushmen of the Kalahari, it is equally appropriate to this case study of the Baka Pygmies of Southeastern Cameroon and applies across Sub-Saharan Africa to nomadic herders and their loss of habitat from elimination of dry season grazing areas along floodplains by dams, and encroachment on their habitat by itinerant farmers as their populations expand and fallow periods disappear.

The Global Environment Facility (GEF) was established after the RIO Summit of 1992 to support costs incurred by governments in conserving public goods with four focal areas: biodiversity, climate change, international waters and ozone layer depletion, as well as desertification and deforestation related to these four target areas. It is jointly run by the World Bank, UNDP and UNEP, with its own Secretariat and has a focal point in each country. It helps support the Convention on Biological Diversity (CBD), the UN Framework Convention on Climate Change and the Montreal Protocol on Substances that Deplete the Ozone Layer (LWAG/DEFID, 2002).

The following case study presents concerns over the implementation of a Global Environment Facility (GEF) program in Southeastern Cameroon (GEF, 1995).

“To date there do not appear to have been any reviews of the impact of GEF projects on poverty, lessons learned about enabling poor people to participate, or the extent to which GEF financing has compensated poor people for the ‘opportunity costs’ of conservation”,

though a two year Review of Human Impacts of GEF-Financed Projects is just underway and/or about to be finished (LWAG/DFID, 2002). GEF programs are implemented by Western NGOs through African governments.

If this case study is any indication about what is happening to the lives of rural Africans living in GEF funded conservation areas, various parties should be held accountable for human rights violations every bit as serious as those being tried by UN tribunals over the Rwanda genocide, as entire lifestyles and traditional management systems are being eradicated. It appears to be a fairly typical scenario of Western NGOs imposing unrealistic conservation systems (e.g., parks and hunting blocks) excluding resource dependent poor, resulting in increased impoverishment and cultural degradation. Governments appear to go along with the process, the political elite in these bureaucracies reaping a percentage of the benefits in the form of vehicles, in-country and overseas *per diem* trips, study tours, etc. They appear so de-linked from the local people and even if they have come out of rural areas, they seem oblivious or blinded by what is happening, or just plainly do not care. The references in this report to Schmidt (1998) and Zouya-Mimbang, (1998) were anthropological analyses written for the GTZ-funded GEF program so that the donors, governments and NGOs were warned by the anthropologists about the consequences of their actions, with recommended mitigation apparently ignored. It appears few, if any, of their recommendations were heeded.

11.11.6.2 Modern conservation and the Baka Pygmy

Over the past couple of decades, the traditional lifestyle of the Baka Pygmies has been disturbed by outside forces including (Schmidt, 1998):

- Central Government's Sedentarization Policy permanently settling the Baka into villages, abandoning their nomadic lifestyle – to some degree this appears to be a continuation of the policy of *regroupement* begun under French colonialism.

- Allocation by government (MINEF – Ministry of Environment and Forests)⁴¹⁸ of commercial forestry concessions dissecting and carving up the forests and creating logging roads that allow access by outsiders, especially outside commercial poachers (Figure 11.2).
- Allocation by MINEF of safari hunting concessions in commercial forest concessions for bongo (*Tragelaphus eurycerus eurycerus*), forest elephant (*Loxodonta africana cyclotis*), dwarf buffalo (*Syncerus caffer nanus*), western forest sitatunga (*Tragelaphus spekei gratus*), hylochere (giant forest hog) (*Hylochoerus meinertzhageni rimator*), *potamochoere* (red river hog) (*Potamochoerus porcus pictus*) yellow-backed duiker (*Cephalophus sylviculator*) and other duiker – areas which the Baka are no longer allowed to frequent, sanctioned by MINEF, the World Bank, the EU and WWF through the Global Environmental Facilities (GEF) program.
- As a result of the Yaoundé Declaration of March 1999 signed by the leaders of leaders of six Central African governments—Cameroon, Chad, the Republic of the Congo, Gabon, Central African Republic, and Equatorial Guinea and a follow-up meeting in 2000 (World Bank/WWF Alliance, 2004) with sanctioning by MINEF, Western NGOs (WWF, WCS) and donors (GTZ, World Bank) through GEF - carving up their forests into parks – which the Pygmies are no longer allowed to frequent.
- Catholic Church, whose influence has been somewhat positive given the uncontrollable changes taking place in the Baka culture.

⁴¹⁸ Ministère De l'Environnement Et Des Forêts, Immeuble Ministériel N°2, Yaounde, Cameroun. In 2004, to increase power sharing between regions, MINEF was split into two ministries; Ministry of Forests and Wildlife, and Ministry of the Environment (Green Issues: wildlife and forestry) and Protection of Nature (Grey issues: Pollution of water, soil and air). In turn, the Department of Wildlife, now under the Ministry of Forests and Wildlife and Ministry of the Environment, was split, respectively into the Department of Conservation and Wildlife, and the Department of the Valorization of Wildlife. Pressure coming from the World Bank may result in a reconsolidation of this ministry, even if there is a name change (Mouncharou, *pers comm.*).

Many people place the beginning of this problem with the World Bank structural adjustment (SAP) program, which began in the late 1980s/early 1990s. The 1981 *Loi Portant Régime des Forêts, Faune et Pêche* (Forestry, Wildlife and Fishery Law) set aside a goal of 10% of Cameroon's territory in protected areas (Mouncharou & Gomse, *pers. comm.*). The goal of each country placing 10% of its territory in natural systems has been established internationally by the International Union for the Conservation of Nature (IUCN)/World Conservation Union (WCU) (Magome & Murombedzi, 2003 *In:* Adams & Mulligan, 2003) emerging out of the World Parks Congress of 1982 in Bali, Indonesia, with a goal of achieving this percentage by 2000 (Peterson, 2003). Among other conditions established by the World Bank in its structural adjustment (SAP) program was to revise the 1981 law. Bank "experts" were allowed to play a major role in rewriting this law that, among other things, stipulated that 30% of Cameroon's territory would be turned into protected areas. The first attempt to pass this law at the National Assembly was rejected by the *Députés* that is the formally elected representatives. The government put pressure on them to pass this law, without which there was a threat of no funding from the World Bank. It was passed into law in 1994 (Mouncharou & Gomse, *pers. comm.*). By 2002, 15% of Cameroon's territory was in protected areas and it is projected the 30% mark will be attained before 2005 (MINEF, 2001), but at what costs to local people and their cultures? A key question, which must be asked, is can the wildlife survive if the people cannot? In marginalizing the people, is it not possible that in trying to survive that they may very well destroy the wildlife out of desperation and/or anger, the very wildlife over which they were once caretakers? Hakizumwami (2000) states that the continual pressure to create more

"wildlife reserves and National Parks is observed in Central African countries for most cases, policies governing their management stress on law enforcement and non-consumptive utilization such as ecotourism without taking into account the key

socio-economic role of wildlife products to the communities living in vicinity of these areas. This resulted in negative attitudes of local communities towards conservation programs, and perpetuated antagonism between these communities and conservation practitioners”.

In Cameroon, it is estimated that if Pygmy populations were to survive only from forest resources without supplementing their diet with starches from “black” farmers, they would have to reduce their populations by 75% of the current density (Vande weghe, 2004). Although a few are turning to farming, many are resorting to stealing from Bantu farmers to obtain their starches (Vande weghe, 2004; Biko’o, *pers. comm.*), which can no longer easily be traded for forest products because of both a decrease in available forest accessible to the Pygmies and declining bushmeat from over-exploitation of what has become an “Open Access Resource”. When caught, the Pygmies are humiliated through public beatings. If wildlife officials find Pygmies with what they believe to be illegal bushmeat, repression is used, including burning down their huts (Biko’o, *pers. comm.*).

Structural Adjustment (SAP) is also believed to have played a major role in increased commercial poaching in Southeastern/Southern Cameroon (Ndoye & Kaimowitz, 1998; Zouya-Mimbang, 1998; Solly, 2002; Bosshard, Bruli, Horta, Lawerence & Welch, 2003; Peterson, 2003; Betti, 2004). This began around 1988 with dissolution of the *Office National de la Commercialisation des Produits de Base* (ONCPB), the state marketing board for cocoa and coffee, resulting in the official price of cocoa being slashed by September from 420 CFA/kg⁴¹⁹ to 250 CFA/kg due to weakening cocoa prices on the world market. Between 1989 and 1990, the cocoa companies were unable to pay farmers. Free distribution of fertilizers, herbicides and pesticides was gradually stopped. From 1991 to 1992,

⁴¹⁹ *Franc de la Communauté Financière Africaine*, Francophone Africa Currency = FCFA, at time 100 CFA/1 French Franc (FF), now fixed to the EURO at 655.957 FCFA/1 EUR.

privatized cocoa trade was reintroduced (e.g., elimination of government marketing boards), resulting in fraudulent behavior, including falsifying the balance for weighing the cocoa, fictional price declarations, illegal night-time purchases at lower prices, the division of purchasing zones by companies to avoid competition and coxage (the selling of one farmer's harvest to another at a low price). The World Bank induced CFA devaluation in 1994 from 50/1 to 100/1 against the French Franc, exasperated this problem (Zouya-Mimbang, 1998; Solly, 2002; Bosshard, *et al.*, 2003). Vande weghe (2004) believes many rural people who had immigrated to the city as a result of structural adjustment policies (SAPs), found themselves without work, returning to their rural roots and poaching, the "politics of despair" as discussed in Chapter 9, Section 9.7.8, Lack of Adequate Alternative Livelihoods. This was a common problem in several west African countries (Stiglitz, 2002) as a result of IMF structural adjustment programs that, among other things, eliminated marketing boards with the result that

"government revenue was lowered, peasants were little if any better off than before, and a few local businessmen (Mafiosi and politicians) were much better off" (Stiglitz, 2002).

Bosshard, *et al.* (2003) also estimate that following the devaluation, which reduced the price of Cameroonian products on the world market, Cameroon's exports of raw logs increased by 34%. Giles-Vernick (2002) explains how IMF/World Bank structural adjustment policies (SAPs), including devaluation of the CFA, while encouraging increased timber and mining in the neighboring Central African Republic, also encouraged the creation of protected areas. In addition, budget cuts recommended by the Bank resulted in the unemployment of large numbers of village extension workers in rural areas (Solly, 2002; Bosshard, *et al.*, 2003). For many farmers, this led to complete or partial abandonment of their cocoa plantations and a loss of faith in the state that had previously been

perceived as their protector, looking after their interests. Looking for alternative sources of income for survival, many groups turned from subsistence to commercial hunting to supply the demands of the increasing urban market (Solly, 2002; Bosshard, *et al.*, 2003) or illegal logging (Bosshard, *et al.*, 2003). Hakizumwami (2000) gives an example of Ndjalobèkoé Village, Boumba-et-Ngoko Division (region of Yokodouma), Southeastern Cameroon, where in 1992 out of US\$ 2,277 (CFA 611,550/FF 12,231) made by the village in that year, hunting constituted the major source of income:

- Hunting: 50.21% of income;
- Livestock (e.g., goat, chicken, pigs), 16.21%;
- Arki (Traditional Beer), 15.70%;
- Agriculture, 11.85%;
- Gathering, 4.10%; and
- Fishing, 1.31%.

Structural adjustment policies (SAPs) exacerbated this problem. On the other hand, as the IMF/World Bank and the West in general push for more protected exclusion zones, there will be dire consequences for local residents. The loss of access to wildlife resources, the main source of revenue in much of the forest, may result in a complete collapse of the rural economy unless economically sound and socially attractive alternatives are offered, as well as a loss in the major source of protein in the forest areas (Hakizumwami, 2000) of not only Cameroon, but the Congo Basin in general (see Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade).

In Cameroon, the Global Environment Facility (GEF) sites/programs of the World Bank and Western Donors were established in the early 1990s, one around the northern savannah site consisting of 28 hunting blocks and parks of Bénoué, Faro

and Boubadjida and the other in the tropical lowland forest site of Southeastern Cameroon. This area of Southeastern Cameroon is part of a Transfrontier Conservation Area (TFCA) created in 2000, the Lake Lobéké/Dzanga-Sangha/Nouabalé-Ndoki “*Tri-National De La Sangha*” National Park. Similar to the San in the Kgalagadi Transfrontier Park (Magome & Murombedzi, 2003 *In: Adams & Mulligan, 2003*), the Baka Pygmies have been seriously marginalized because of this process.

While in recent times few people lived within the protected areas in the northern savannah zone, which had been established during the colonial era (see Chapter 5, Section 5.9.3.4, Over-population and livestock, a threat to wildlife in northern Cameroon), the Southeast forest area was the home of the “Forest People”, the Baka Pygmies and a number of Bantu ethnic groups. There are actually three Pygmy groups in Cameroon. The largest group is the Baka found in Southeastern Cameroon west to Mintoum and crossing into portions of Gabon, Congo, and the RCA. In Cameroon, this group is estimated at about 100 – 150,000 people (Mouncharou, *pers. comm.*). An estimated 40,000 Baka live in Southeastern Cameroon⁴²⁰ speaking an Oubangan language from the Gbandili-Sere family (Schmidt, 1998). In total there were an estimated 84,440 persons living in Southeastern Cameroon⁴²¹ in 1987, the difference being made up of large numbers of different Bantu-speaking ethnic groups.⁴²² The density of people is 2.2 inhabitants/km²; among the least populated regions in Cameroon. The majority of people live in a few major towns (e.g., Yokadouma, Moloundou,

⁴²⁰ In this case, Southeastern Cameroon is really the Eastern Province that extends from the Dja Biosphere Reserve eastward (Biko'o, *pers. comm.*).

⁴²¹ In this case, Southeastern Cameroon appears to be the Division of Boumba-et-Ngoko. If the 84,440 inhabitants are divided by 2.2 people/km², one obtains 38,181 km², nearly the same as the area of 38,661 km² in Table 11.19 below.

⁴²² The dominant ethnic group in the Eastern Province, Cameroon in the Division of Boumba-et-Ngoko is Vongvong (Pongpong). Southeastern Cameroon (Division of Boumba-et-Ngoko) is broken up into three *arrondissements*; Yokadouma, Moloundou and Garigombo. The dominant ethnic group in Yokadouma is Vongvong (Pongpong), in Mouloundou the Bangando and in Garigombo the Mpiemu (Biko'o, *pers. comm.*).

Kika, and Libongo) and in small villages along the main logging roads. Forests are virtually uninhabited (e.g., not permanently inhabited), covering 85% of the Southeastern Cameroon (Zouya-Mimbang, 1998), but play an important role in both the survival and cultures of the local people, especially the Baka.

Between about 1995 and today, parks and safari areas have and are being established as though this vast area of Southeastern Cameroon is empty of people, consisting only of elephant, gorilla, chimpanzee and other charismatic megafauna with which the West is in love. On the contrary, these forests are the gardens and back yards, especially of the Baka, whose lives risk to be forever changed given the current approach of excluding them from much of what they consider their forest (see Chapter 2, Section 2.1.5.3, Mobility and resource management, Baka Pygmies of Southeastern Cameroon). It might be argued that the Baka today are more endangered than the lowland gorilla; European conservationists and government being more concerned about the great apes and forest elephants than this ethnic minority (see Chapter 3, Section 3.6.1, Separation of Maasai from Ngorongoro Crater). To think that this is occurring in the 21st century, backed by Western donors and NGOs with the same apparent lack of sensitivity as occurred during the colonial era, is appalling. It is hoped that somehow this case study will sensitize decision makers, NGOs and donors to the steps that must be taken to integrate these cultures, especially the Baka, into the sustainable management of these areas. The current breakdown of the land use as imposed by the GEF program in the Division of Southeastern Cameroon, officially called Boumba-et-Ngoko is depicted in Table 11.19, with little or no consultation with local people in determining these land uses. Just west of this case study area, Nelson (2003b) details similar non-consultative processes marginalizing Baka in the creation of the neighboring Dja Biosphere Reserve and Boumba-Bek National Park that, with Minkébé National Park in Gabon and Odzala National Park in the Republic of Congo, roughly demarcate the new

Congo Basin Forest Partnership (CBFP) landscape of the TRIDOM (Dja-Boumba-Bek-Nki-Odzala-Minkébé Transfrontier Conservation Area (TFCA) between Cameroon, Congo Brazzaville and Gabon) project being funded by GEF, which cuts Baka off from accessing key resources in these areas. Duffy (2000) explains that the Western

“donors and conservationists often closely mirror the industrialized world. This has led to the imposition of wildlife preservation plans that ignore the needs of rural people in particular”.

Thus, about 70% of the forest area, which the Baka freely roamed, have become off limits to them from “development” and “conservation and biodiversity” activities. What one is seeing all over Sub-Saharan Africa, with pressure from Western NGOs backed by Western donor money, is neo-colonial or eco-colonial imperialism to the highest degree; areas being set aside for wealthy white tourists and hunters from America and Europe to the exclusion of the African people.

Table 11.19: Land use, Southeastern Cameroon (Division of Boumba-et-Ngoko)

LANDUSE	HECTARES	PERCENTAGE TOTAL AREA
Lake Lobéké National Park	217,850 ha	7
Nki National Park	309,360 ha	8
Boumba-Bek National Park	238,260 ha	6
Safari Hunting Zones (in logging areas)	1,048,090 ha	27
Logging areas	699,010 ha	18
Community Hunting Zones (a)	1,203,270 ha	31
Other areas	150,260 ha	4
TOTAL	3,866,100 ha	-

(a) Community Hunting Area, Cameroon/*Zone d'Interet Cynégétique a Gestion Communautaire*

Source: Leonard Usongo (WWF) Mathias Heintze (GTZ/GEF). Feb. 26, 2003. WWF SE Forest Projects, B.P. 134 Yokadouma, Cameroon, Central Africa, with permission WWF.

One could argue if the current approach to conservation continues unabated, the Baka way of life is in jeopardy, and will likely fade away within the next one to two generations; and with this - a loss of cultural and traditional knowledge that will never be recovered. Once again, land and resource tenure systems are at the heart of this issue, with the state owning about all land outside of the cities, while traditional ownership goes unrecognized (Peterson, 2003).

For the Baka, each family group or band has a clearly defined territory. Everyone from this family has the right to use the “paths of their ancestors” and to exploit the resources around these paths. Only those Baka and Bantu who have been authorized by the *propriétaires de la route* or the owners of the route have the right to use these paths and thus, the resources of an extended Pygmy family (Schmidt, 1998) (see Chapter 2, Section 2.1.4.2, Territory and wildlife management among the Baka Pygmies and other ethnic groups of Cameroon). The Baka admit that it is impossible to feed themselves all year from the forest, especially during the rainy season, when the wild ignames are not yet mature. Thus, their movements, like any hunter gatherer, are seasonal (see Chapter 2, Section 2.1.5.3, Mobility and resource management, Baka Pygmies of Southeastern Cameroon). The government sedentarization policy for the Baka has had a major impact on this semi-nomadic lifestyle.

11.11.6.3 Failure to integrate Baka into managed bushmeat harvests

“Non-timber forest products (NTFPs) and subsistence agriculture have traditionally formed the basis of local livelihoods and exchange networks between different groups of people living in these forest areas” (Forest Monitor, 2001).

Bushmeat is very important in the diets of the Baka. They distinguish between hunger “*pote*” and hunger for meat “*pene*”, without which they lose their love of life (Schmidt, 1998). Like in any hunting-gathering culture, serious hunters such as elephant and gorilla hunters with great skills, number among a small percentage of the male population (Zouya-Mimbang, 1998), though there are many “small game hunters”. Other resources harvested from the forest include various wild roots, ignames (wild yam/tuberclles), honey and termites. They also fish - men with hook and line and traps, women with scoop nets and weirs (Schmidt, 1998).

Most hunting also takes place within short distances of the village. Hunters are, for the most part, men of between 18 and 55 years of age, who occasionally use guns, but mostly catch their prey with steel wire traps/snares (*pieges*) (Abilogo, Mondo, Logo & Nguiffo, 2002). This form of hunting has been adopted from the Bantu. Formerly, the Baka mainly hunted with spears and *arbaletes* (crossbows and poisoned arrows).

During their long dry season (August/September to March), visits may be made in the forest to the “Molongo”, camp where the Baka gather roots and wild mangoes, fish with weirs, search for honey and hunt small game with lance, snares (pulled each morning), often made from steel cable instead of traditional vines, or crossbows with poisoned arrows (*arbaletes*). This is believed to be mostly subsistence hunting, since the villages are too far removed to transport large quantities of these resources, other than when some of them periodically return to town with some game and honey to exchange for money or trade for basic necessities. Mobility of the Baka, like many hunter-gather groups prevented over-exploitation (see Chapter 2, Section 2.1.5.3, Mobility and resource management, Baka Pygmies of Southeastern Cameroon). Their identity with the forest spirit, Djengi, traditionally prevented them from harvesting more than they

needed for basic necessities (food and the trading of surplus bushmeat for basic household necessities and sometimes alcohol) (Schmidt, 1998) (see Chapter 2, Section 2.1.8, Taboos as an Aid in Wildlife Management).

Unfortunately, MINEF has outlawed hunting for protected and partially protected species (elephant, buffalo and gorilla), though allowing “non-exaggerated” harvesting and collecting of certain species such as reptiles, rodents and certain *cephalophores* (duikers) (Mboh, 2001; 2002). Thus legally, the Pygmies have been officially cutoff not only from accessing key hunting areas, but also key species that have provided them with major sources of protein and income (elephant cut into about 250 pieces valued at CFA 1,500 each⁴²³ and gorilla into 120 pieces of about the same value) (Mouncharou, *pers. comm.*), in favor of small game with comparatively little protein or monetary value. Though controversial, all three of these species could probably be harvested sustainably by Pygmies as a source of both protein and money, under an intensive management scheme. However, as will be described below, the current uncontrolled and unmanaged “Open Access” bushmeat trade, created through modern conservation schemes displacing traditional management controls, is likely unsustainable. In fact, Hakizumwami (2000) states throughout central Africa,

“since wildlife is state owned wildlife is treated as an open access resource, and individuals have an incentive to (harvest) as much animals (as possible) to maximize income before other people could do the same. As a result, local communities no longer feel themselves responsible for the conservation of wildlife. This led to the degradation of the symbolic value of wildlife in the eyes of local communities and to the impoverishment of the biodiversity”.

The Baka cannot, or will not, abandon traditional forest foods even if they are becoming rare. At Mambele village, the WCS tried to get the Baka to stop hunting

⁴²³ Euro 2.3 & US\$ 2.7 in 2005. Note this is about 8.8 times less than Tomlinson (2007) estimates for the meat value of a forest elephant); US\$ 6,000 versus US\$ 675.

and to eat beans in place of bushmeat, which the Baka cannot accept and which demonstrates a scorn for their culture. For the Baka, the forest is not just a source of food, but also a source of happiness. One of the important attributes of the forest is bushmeat. To forbid eating bushmeat is to kill or eliminate their culture. They ask, how can a people who buy nothing from the industrial world, except pots and machetes, who have no desire to change their lives, survive if they cannot exploit the forest? (Schmidt, 1998). The external idea of “conservation” that is, as described by Schmidt (1998), “preservation areas” and exclusion zones such as parks and safari areas, is not easily accepted by their culture. The Baka have traditionally always practiced “conservation” that is sustainable use.

The Baka and local Bantu call organizations like WWF and WCS, “Dobi Dobi”, which appears to be their way of pronouncing “WW” in World Wildlife Fund (WWF)’s acronym “WWF”. For them, these NGOs are American organizations or white Anglophones driving around in new air-conditioned Toyota land cruisers with the windows up, who have bought “their forests” from the President of Cameroon to protect wildlife and to stop them from hunting. The Baka fear the “Dobi Dobi” more than they fear the Bantu (Schmidt, 1998). The local people feel disdain for these “foreigners” driving their air-conditioned land cruisers and the repressive policies being imposed on them, but are disorganized and not knowing their full rights are incapable of fighting what is happening. Any attempt to organize is dissuaded by authorities, being put into a political context such as forming an opposition party/group. University students from the area are afraid to become a voice for the people, as they fear being killed through poison or witchcraft for standing up to the status quo (*Biko'o, pers. comm.*). Local people have even tried to stop logging of “their forests” by blockading logging roads. Such efforts have failed, as the military/police through repression, quickly put a halt to such insurrection.

The Baka see the protected areas (Lake Lobéké, Boumba-Bek, Chute de Niki national parks and hunting blocks) as a white man's plan to protect wildlife from their hunting, which implies for them that the white man places more value in wildlife than in the Baka who live off wildlife. For them, the whites want to protect wildlife and make the Baka disappear without bushmeat, without means and without culture – a humiliation (Schmidt, 1998). It should be noted that in an earlier case study on Tanzania, Tepilit Ole Saitoti of Ngorongoro had similar statements to make with regard to how whites perceived wildlife versus his Maasai people (see Chapter 3, Section 3.6.1, Separation of Maasai from Ngorongoro Crater).

“If we have nothing to eat and the safari people and Dobi Dobi eat nearby, is this good”? (Schmidt, 1998, quoting a Baka women).

The references in Schmidt are to one particular safari operator,⁴²⁴ but in general, most safari operators consider anyone in their hunting block as a poacher and if found, they will normally confiscate their snares and any meat or food, burn their camp, likely ruff them up and then throw them out of the area. Not far away, in 2007 for revenge, after a poacher was allegedly shot in self-defense by professional hunter Geoffroy de Gentil, poachers destroyed Lognia camp belonging to Mayo Oldiri along with three landcruisers (Safari Press & Sports Afield, 2007). To the principal author's knowledge, there had been no attempt by an operator to develop a land use plan with the local community, allowing controlled access for various resources in the hunting block, while collaborating with the community to keep outsiders from gaining access.

⁴²⁴ Alain Raoul, Africam Safaris, Chateau L'Abeille, 4562 Cerdon du Loire, France, Tel: 333-238360714. Had problems in getting along with local people in hunting block in southwest border of Lake Lobéké Park. Eventually he had to move out of area to an area north of Libongo, since area was heavily poached, many say in revenge for repression against local people.

11.11.6.4 Logging companies and the unsustainable bushmeat trade

For the Baka, the parceling up and fragmentation of the forest through its dissection with commercial logging roads has allowed the sun in so that it is now not much different than the village [see Section 11.11.7, Case Study Bongo in The Congo (Brazzaville)]. Some complain that the logging roads now disorient them. Many medicinal plants and plants that furnish oil are found only in virgin forests (Schmidt, 1998). This in-migration of large numbers of people working in the logging camps creates tremendous pressure on the wildlife and helps create a market for commercial poaching (Zouya-Mimbang, 1998; Peterson, 2003).

It is estimated that logging trucks (*grumiers*) transport 85% of the bushmeat from commercial poaching camps to the cities created by the logging camps and to urban centers as far away as Douala and Yaoundé. The truck drivers often providing the rifles, ammunition and steel cable, drop off the poachers and pick them up (Zouya-Mimbang, 1998; Ape Alliance, 1998 *In:* Hakizumwami, 2000). In some cases, high level *functionnaires*, including wildlife officials, organize, support and protect poaching networks (Vande weghe, 2004). Guns can be confiscated, poachers arrested and both can be back in circulation within days. Commercial poachers in Cameroon and the region, but often coming from outside the areas being poached, can earn excellent salaries comparable to park guards and thus, have little incentive to stop; in the Central African Republic, a poacher can earn US\$ 400-700/year, in northern Congo US\$ 300/year and in Cameroon from US\$ 250-1,050/year (Peterson, 2003). Often, local Pygmies are co-opted to help poachers (Vande weghe, 2004) and maybe this is understandable given the fact that much of their forest and its resources have been confiscated by government, NGOs, logging companies and safari operators. Maybe they need to get in on the action while it lasts, as they see their resources being plundered before their eyes.

The problem of commercial bushmeat is not deep forest poaching, but that which takes place just off logging roads (Barrado & DeGeorges, 1995; Zouya-Mimbang, 1998), though today it is becoming harder to find deep forests as logging roads expand and penetrate, bringing sunlight, poachers and ecological/cultural devastation to the shaded domain of the Pygmies. Until recently, hunted duiker populations were re-supplied by individuals migrating in from adjacent non-hunted areas. As development of the logging industry continues throughout the region, undisturbed habitat will diminish as logging roads increase access, fragmented forests will increase and game populations that have been able to tolerate even commercial hunting levels may lose that capacity due to habitat degradation and increased access to “seed” populations (Figure 11.2). A significant decline in duiker could result in adverse impacts on the population status of predator species such as leopard and golden cat (Eves, Stein & BCTF, 2002). Commercial poaching traps all species regardless of their international status under CITES, their local status under Cameroonian law, sex, age or pregnancy status. In essence, logging and logging roads have broken open a previously closed system,

“A door has been unlocked and drawn wide open, so that vast portions of this recently intact, remote and challenging forest are today entirely no longer intact, remote, or even challenging. Loggers’ roads throughout the Congo Basin today allow hunters in and meat out, and they have made bushmeat cheap and readily available to a huge market of urban consumers” (Peterson, 2003).

They have opened the door, but turned off the alarm, allowing free access by thieves (Peterson, 2003) (see Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade).

Robinson and Redford (1991 *In:* Ngandjui, 1998) estimate a maximum sustained yield of duiker/*cephalophe* as:

- 60% of the annual population for species with short lives; less than five years;
- 40% for species with average lives; five to ten years; and
- 20% for species with long lives; more than ten years.

The blue duiker (*Cephalophus monticola*) and “red duiker”⁴²⁵ making up the majority of the bushmeat harvest in Southeastern Cameroon, fall into the 40% category. The average density was 2.78 blue duiker/km² and 7.35 “red duiker”/km². Meat is sold either fresh or smoked “boucané”.⁴²⁶

Peterson (2003) estimates that hunters can sustainably harvest the following percentage of the annual populations:

- Rodents, 13-80%;
- Ungulates, 4-25%, one species up to 50%;
- Primates, 1-4%;
- Chimpanzee and bonobos (the latter found in the Democratic Republic of Congo only, not in Cameroon or Congo Brazzaville), 2%; and
- Gorillas, 4%.

⁴²⁵ “Red” duiker “*Cephalophus rouges*”: Peters (*Cephalophus callipygus*), Bay (*C. dorsalis*), Gabon (*C. leucogaster*) and Black-Fronted (*C. nigrifrons*).

⁴²⁶ The smoking of the meat is very crude compared to Western methods of preparing a brine marinade to help flavor and desiccate the meat prior to smoking. In the forest, grided platforms about one meter off the ground are constructed and the meat is placed on top and in turn, covered in green leaves. A fire is made with green wood underneath the platform and the meat is smoked for about 24 hours. The outer layer of meat becomes covered in a black carbonized layer, which keeps out oxygen and bacteria to some degree. Inside this carbonized mass is “cooked”, not smoked, meat with a high moisture content that is still susceptible to decay by anaerobic bacteria, thus limiting the shelf life of meat processed in this manner. This shelf-life is relatively short.

Tropical forests can sustainably provide between 150-200 kg/km²/year compared to more productive savannas that can yield as much as 6-8 tons/km²/year in wildlife or 4.6 tons/km²/year in domestic livestock. Assuming a minimal daily protein requirement based on USA standards of 50 grams/average man/day, it is estimated that in Central Africa's forest areas, wildlife derived protein can support low densities of 0.3 people/km², while cultivation of staples can support 20-28 people/km² in carbohydrates (Peterson, 2003). Given a population of 84,440 people over 38,661 km², this amounts to 2.2 people/km² exceeding the ability of the area to support the local population, let alone urban centers, in protein requirements from bushmeat.

This is further substantiated by the fact that the Southeastern Cameroon Global Environment Facility (GEF) area of 3,866,100 ha (38,661 km²) could support a theoretical annual offtake of 107,477 blue duiker and 284,158 red duiker.⁴²⁷ Given a human population of 84,440 people, not considering commercial demands in places like Douala and Yaoundé, this would mean only 4.64 duiker/person/year indicating that this is unlikely to fulfill the protein needs of even the local population. Rural families consume bushmeat on the average of twice a week, whereas families associated with logging companies and buying power, consume bushmeat on the average of three times per week (BCTF, 1999). Peterson (2003) estimates that logging villages, which are artificially created, eat twice as much bushmeat as non-logging villages. This issue becomes even more serious if one looks at the fact that currently about 70% of Southeastern Cameroon has been turned into protected areas off limits to local communities, leaving local communities with only about 1,203,270 ha (12,033 km²) where they can legally undertake subsistence hunting in community hunting areas (see Table 11.19: Land use, Southeastern Cameroon). These areas risk to be “cleaned” by people, both Baka and Bantu, who depend almost entirely on bushmeat for their

⁴²⁷ 2.78 blue duiker/ km² and 7.35 “red duiker”/km² (Robinson & Redford, 1991 *In: Ngandjui, 1998*).

protein. Robinson and Redford (1991 *In: Ngandjui, 1998*) concluded that the current offtake of blue and red duiker is not sustainable in the long-term. Stopping outside commercial poachers and involving local communities in a sustainable harvest program is the only hope that species such as these, will survive.

Likewise, Peterson (2003) is concerned over the movement from traditional hunting of the great apes that was likely sustainable to uncontrolled commercial hunting, often by outsiders, associated with logging, fragmentation of the forests and increasing demands from both logging companies and urban centers. This risks to result in the extinction of these species in the next 10-50 years due to their very low fertility rate, about 25% of other mammals. On average, the female apes (chimpanzees, gorillas and bonobos) produce their first offspring at the age of 15 and continue producing once every five to eight years. A recent survey estimated that in protected areas of the Congo Basin, chimpanzees have declined by 91%, bonobos by 83% and gorillas by 100% (Peterson, 2003). A recent survey by World Wildlife Fund (WWF) in the Democratic Republic of Congo, where all bonobos are found, mostly in the Salonga National Park, estimates that the population has been reduced from 50,000 down to 10,000 from poaching (Eilperin, 2004). Tomlinson (2007) raises similar concern about over-harvesting of the forest elephant in the Congo Basin. Peterson (2003) believes the unholy alliance between loggers and hunters has turned the traditional hunting grounds of the Congo Basin into killing fields and questions, as conservation is currently being undertaken, whether the secondary partnership between conservationists and loggers, as will be discussed, can somehow magically end the killing.

In an attempt to control the bushmeat trade, an Association of Bushmeat Collectors (*Association des Collecteurs de Viande*) has been functional since about 2005 in Southeastern Cameroon. They are issued by government with

collecting permits that limit how much meat can be collected and sold; renewable every three months. They are the buyers, sellers and transporters of bushmeat, not the hunters. They are beginning to play an important role in self-policing and in stopping poaching by outsiders (Biko'o, *pers. comm.*). This a step in the right direction that needs to be linked to a management/monitoring program in the field that assures harvesting by local hunters is sustainable (e.g., development of management plans that have rotating open and closed hunting zones, using indices such as catch per unit effort and distance into each zone to assure a viable offtake, etc.).

11.11.6.5 Zones De Chasse Communautaires (community hunting areas)

These areas are also called Community Hunting Area, Cameroon/*Zone d'Interet Cynégétique a Gestion Communautaire* (ZICGC). These zones make up about 30% of the land use in Southeastern Cameroon. They tend to be along the major roads where people live and have a maximum width from any point on the road of about 25 kms.

Villages that form a ZICGC are paid 10% of all trophy fees (*taxe d'abattage*) and 10% of the concession fee (*taxe d'affermage*) from neighboring Professional Hunting Blocks/*Zone d'Intérêt Cynégétique* (ZICs) – a tax based on the size of the area, as well as 100% of the concession fee (*ammodiation*) in the ZICGC (Ngoufo & Bobo, 2005). For instance, CFA 30,000 (US\$ 46) per day is paid by Chasse Libre Hunters (Self-Guided Sport Hunters) with a minimum of ten days hunting – thus, CFA 300,000 (US\$ 460) and anything over ten days results in another CFA 300,000 regardless of whether it is one day or more. This is for rental of the Community Hunting Area, Cameroon/*Zone d'Interet Cynégétique a Gestion Communautaire* (ZICGC). The above money is paid to the *Eaux et Forêts* (Game Department), which in turn, pays the money over to the villages. In

some cases rental of a block may occur by a professional hunter. According to Ngonon and Defo (2004), the 14 ZICGCs are managed by nine Committees for Valorization of Natural Resources/*Comités de Valorization des Ressources Fauniques* (COVAREF) took in a total of US\$ 30,589/Euro 25,883 (16,824,044 CFA) in 2003 or an average of US\$ 2,184/year per community hunting area.

Cam Greig (*pers. comm.*) is a biologist with La Roche Pharmaceuticals, who is a third generation son of missionaries born and raised in Cameroon and, more importantly, a *Chasse Libre* Hunter (Self-guided hunter or better put, he hunts with traditional hunters as the Baka) who has hunted Cameroon extensively. He thinks the idea of the local community making money from guiding *Chasse Libre* Hunters, under current land uses in Southeastern Cameroon, is unrealistic, since to get to undisturbed areas where there is not so much pressure on the wildlife, that is areas that should be rich in forest elephant (*Loxodonta africana cyclotis*), bongo (*Tragelaphus eurycerus eurycerus*), forest (dwarf) buffalo (*Syncerus caffer nanus*), western forest sitatunga (*Tragelaphus spekii gratus*), giant forest hog (*Hylochoerus meinertzhageni rimator*) and yellow-backed duiker (*Cephalophus silvicultor*) among others, one must walk at least two to three days from the nearest village (e.g., 25 kilometers or more). He believes these “ZICGCs” in the Southeast are too narrow to make them ecologically and economically viable for *Chasse Libre* Hunting.

11.11.6.6 Revenue sharing from safari hunting

As noted above, revenue sharing (supposedly 10% of all trophy fees and 10% of the concession fee in Professional Hunting Blocks/*Zone d'Intérêt Cynégétique* [ZICs]) with the communities of Southeastern Cameroon is supposed to take place from profits associated with both safari hunting (99% white safari operators) and logging. Below is how revenue was supposedly shared from the 2000, 2001 and 2002 safari hunting seasons based upon concession fees only (Table 11.20).

Table 11.20: Income from safari hunting concessions, Forest areas (Southeastern Cameroon)			
	1999-2000	2000-2001	2001-2002
	Million CFA (\$US)/% Total	Million CFA (\$US)/% Total	Million CFA (\$US)/% Total
Village	9,809,811 (15,092)/9.5%	15,090,411 (23,216)/9.3%	15,737,556 (24,212)/10%
Communes (Local Government)	15,003,244 (23,082)/15%	31,363,136 (48,251)/19.4	27 (41,539)/17%
State	78,747,654 (121,150)/76%	115,095,908 (177,071)/71%	113,115,763 (174,024)/73%
TOTAL	103,560,709 (159,324)	161,549,455 (248,538)	155,853,319 (239,775)
Note: Includes trophy fee and concession fees. Extracted from: Mboh (2000, 2001& 2002), CFA 650/\$US Source: Prepared by Principal Author			

If there is a population of 84,440 people and we assume six people/household, between 1999 and 2002, money destined for the villages would amount to a high of \$US 0.29/person/year or \$US 1.72/household/year to a low of \$US 0.18/person/year or \$US 1.07/household/year. Once again, benefits from this “*Stage 3 CBNRM*” program (see Chapter 9, Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa) would best be spent on common property benefits. It is understood that this money and populations are not distributed

equally so that some villages might benefit more than others. However, this does provide a global view of what it implies for the economy of the area.

When asked about transparency and accountability in how this money and revenue from logging is used back in 2001, the then Director of Wildlife, Denis Koulagna (*pers. comm.*), explained there was no mechanism in place to account for this. Introduction of such systems is critical to the long-term success of this program and is a major shortcoming in most CBNRM programs to date, resulting in corruption and misuse of the money at a local level. It appears that in 2003, a program called *Program de Securisation de Resources Fauniques* was being developed. At the level of the Commune (Local Government), the State had planned to appoint a *President de Commission Marché, Receveur Municipal* and a *Controler Financier* linked to a national *Agence de Regulations de Marché Publics* to assure transparency in how money is expended. Each village has a development committee with a president and treasurer, which would send three of its members to a Commune Commission that would consist of the elected mayor, development NGOs/organs such as WWF, GTZ, MINEF, SNV (*Service National des Vocations*, France) and Wildlife Conservation Society (WCS), and the *Prefet/Sous Prefet* representing the State along with the *Receveur Municipal*. This group would approve village projects to assure that there is no overlap with planned Commune level development. In the Southeastern Cameroon once the projects are approved, the Departmental Delegate of MINEF based in Yokadouma, would release money to the village for the project. According to Mouncharou (*pers. comm.*), ministerial changes and politics prevented this process from taking place, but plans still existed in 2005 to move in this direction. Currently, decisions to fund projects by the commune are made up of the mayor, a representative of the game department, the *Receveur Municipal*, the *Conciliator Municipal*, a technical person from the government (e.g., agriculture) and a representative from the village making the demand (Mouncharou, *pers. comm.*).

Ngoufo and Bobo (2005) have undertaken a detailed analysis of the strengths and weaknesses of community hunting blocks in Cameroon. A large number of proposed projects were never approved, implying high levels of corruption at all levels of government. Corruption and mismanagement is also a problem, including within individual COVAREFs (Ngoufo & Bobo, 2005). When money does get to the village level, currently there is no auditing (*Mouncharou, pers. comm.*; Ngoufo & Bobo, 2005). Lack of accountability, transparency and misuse of funds is a major problem, especially by game department officials who collect community funds from professional hunters. Women and the Baka are poorly represented in decision making. Communities are not able to adequately monitor offtake in their areas by professional hunters or in the Professional Hunting Blocks/*Zone d'Intérêt Cynégétique* (ZICs), so as to have an idea of how much money they should make or potentially to assure sustainability. To date, most funds have been used for common property benefits linked to schools, wells and construction of a pirogue. Since this process is only four to five years old, moving towards establishing transparent decision making processes will help overcome the above issues. Similar to CBNRM programs, money destined for the community COVAREFs must pass through government. The procedures are so complicated and the money must pass through so many levels of government from national through local, that most of it is siphoned off, little or none reaching the communities. The feeling is that the only hope for the COVAREF concept to work is to rewrite the basic legal statutes, giving these bodies more independence (*Messabiem, pers. comm.*). In recent times, the community hunting block rental concession fee (*ammodiation*) and the percentage of the trophy fee destined for the community is paid directly to the COVAREF by the hunter. The COVAREF can even issue a certificate of origin for the trophy (*Biko'o, pers. comm.*). One can only hope this is a dynamic process that evolves.

11.11.6.7 Income from commercial forest exploitation

A key question, which must be asked, is what percentage of the net profits after they are divided between stakeholders (e.g., logging companies, safari operators, national and local government, rural communities) really get down to the local level? Similar to safari hunting, commercial logging and forestry development tends to result in redistribution of wealth from local people to national elite (e.g., government, businessmen) and foreign companies, resulting in further impoverishment of local people (Witte, 1992; DFID, 2000 both *In: Forest Monitor*, 2001) (see Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders). There are just too many middlemen between these rural people and their resources. Until local communities establish their own safari, tourism and logging companies, they will be on the losing end of the deal. Some will laugh and say how is this possible? Many of the timber fallers are Pygmies. With proper education and training, there is no reason they cannot run their own companies, initially joint venturing if necessary to gain certain technologies. As with wildlife, this comes back to land and resource tenure for Sub-Saharan Africa's rural communities (see Chapter 9, Section 9.9.2, Land and Resource Ownership, Key to Success).

According to Forest Monitor (2001),

“Forestry taxes in Cameroon are generally low. The cutting tax (*taxe d'abattage*) is 2.5% of the value of production while the concession tax (*redevance de superficie*) is approximately 5-10% of the value of production. When logging an area of forest for the first time, a company may falsify its tax declarations to conceal illegal logging”.

An estimate in 2003 of the “*Taxe de Superficie*” (*redevance de superficie*) (tax passed on hectares of logging concession) of each forest concession (UFA) brings in approximately (Mouncharou, *pers. comm.*):⁴²⁸

- Commune (Local Government) of Yokadouma: CFA 1,250,000,000/year (US\$ 1,923,076);
- Commune of Moloundu: CFA 600,000,000/year (US\$ 923,076); and
- Commune of Salapombe: CFA 200,000,000/year (US\$ 307,692).

It is unclear how much this is of the gross/net from logging, though it is assumed to be very minor. In theory, income to government from these forest concessions is divided with 10% going to the villages, 40% to the communes and 50% to the State. In 2003, this amounted to US\$ 315,384/year going directly to the villages or about US\$ 3.74/person/year or US\$ 22.44/household/year.

Peterson (2003) and Biko'o (*pers. comm.*) argue that little of this money gets to the local communities, most of this, as with money from hunting, being kept by the communes or other government officials.

In the school year 2000/2001, 15 students from the Yokadouma and Gari-Gombo commune approached the human resources officer (*chef de personnel*) of the logging company for financial aid, since they had heard from elders that benefits should be available from the logging company for this purpose. The company explained that they were already paying money to the government and to speak with the commune. The commune refused to acknowledge that it had money for students generated from logging. The students then went to the *prefet* who sent the commune a letter asking what had happened to the money given to the commune for the students. It was at that point in time that 10 of 15 students

⁴²⁸ CFA 650/US\$ in 2003.

received CFA 25,000 (US\$ 39)/student. Since then, CFA 50,000/student (Euro 77/US\$ 91 in 2005) is provided for ten students, but to obtain this funding is a major struggle. In 2004, the number of needy students has increased three-fold, but they struggle to increase the amount of financial assistance (Biko'o, *pers. comm.*). As with revenue from hunting, it will be necessary to put in place transparent and accountable systems to assure the proper use of income.

11.11.6.8 Community forests

According to Messer (2001),

“Cameroon is possibly the region’s most advanced country in terms of transferring usufruct rights over forests to rural communities, through the legal registration of ‘community forests,’ although a number of moot points and perplexities remain in terms of what is supposed to happen after registration”.

“Cameroon has introduced legislation for community forests, but the process is complex (Pénélon, 1996 *In: Roe, Mayers, Greig-Gran, Kothari, Fabricius & Hughes, 2000*) and corruption among those responsible for allocation of timber concessions has resulted in areas being allocated twice or even more (Phil Burnham, *pers. comm. In: Roe, et al., 2000*).⁴²⁹ It takes at least a year to register a community forest, whereas a timber concession may be allocated within a few weeks (Pénélon, 1996 *In: Roe, et al., 2000*)” (Roe, *et al.*, 2000).

According to Vande weghe (2004), the maximum area a community association can be allocated to manage is 5,000 ha compared to commercial logging concessions that can be as much as 200,000 ha in Cameroon.

Biko'o (*pers. comm.*), an Mpemu from Southeastern Cameroon explains that as of 2000, communities were able to form a committee and produce a management

⁴²⁹ No reference to this individual in Roe, *et al.* 2000.

plan (*Plan simple de gestion*) in order to be allocated 5,000 ha of forest. However, since the communities lacked technical skills, MINEF personnel produced all documentation including plans, selected committee members, who then were beholden to MINEF staff, and arranged so that the flow of any income from the forests requires signatures of the *Delegué* of MINEF at the provincial level, of the *prefet* and *sous prefet* and the *maire* (mayor) so that by the time the money reaches the local community, little or nothing is left (Biko'o, *pers. comm.*). As with money from safari and *chasse libre* hunting, there is no accountability as to what happens to the money. Peterson (2003) notes, not only Cameroon, but across the Congo Basin, while state rhetoric often appears to support community tenurial claims for restricted use purposes, in practice, communities remain marginalized by forest estate zoning as in the colonial era and one can add from zoning of parks and hunting blocks that exclude and impoverish rural communities, economically, nutritionally and culturally.

11.11.6.9 Adverse impacts of exposing Baka culture to a modern economy

One must ask - is the amount of money brought into Southeastern Cameroon, versus the disruption of traditional lifestyles worth it? This is something the people living in Southeastern Cameroon should be allowed to determine themselves as opposed to having it determined for them. Certainly, this amount is insignificant in their daily lives and in their nutrition, which is likely worse off because of compression into smaller and smaller areas and thus, decreased availability of natural resources necessary to survive. These resources are further reduced with the fragmentation of these forests by logging roads, opening access to outsiders who are mining the Pygmies' and local Bantu's resources for short-term gain, even encouraging them to join in the fracas.

Forest Monitor (2001) raises concern about adverse impacts on creating social conflicts, loss of cultural identity, corruption and under-/malnutrition linked to commercial logging that endures well after the forests are cleaned of their value and the logging companies have move on. Only a small fraction of the Baka and Bantu obtain jobs from the forestry, safari or NGO community. Schmidt (1998) noted that access to money is depersonalizing traditional relations within the Baka community, especially among the young, who often hide their money from their wives, and which liberate individual wage owners from past social obligations that assured survival, both physically and culturally of this small-scale society.

Traditionally, there was no social stratification within the Baka. Like in many hunting and gathering societies, there was a high level of equality, even women having a say in important decisions. Today, wage earning Baka often mock and belittle non-wage earners. In addition, wage earners often give up hunting, making their families dependent on others for bushmeat. Only those few working for safari hunting companies still get bushmeat. Meat is rarely bought with money from their salary. Alcohol abuse by the Baka male in a moneyed economy is also an issue. Smoking marijuana is part of their culture. Often the support of the family is left in the hands of the wife since the male is away working or drinking his salary. Since he is working, the male spends less time imparting traditional knowledge to his children. Often, the Baka women must work for very little for Bantu women to “win” back some of the money lost by her husband in buying locally made wine. Prostitution by the Baka female also becomes an issue (Schmidt, 1998). Like the San “Bushmen” (see Chapter 9 Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa, LIFE Namibia Nyae Nyae Conservancy) and the American Indian, they appear to be caught between two worlds, one they cannot go back to and the other for educational and other reasons they are not ready to join. Thus, they drown their confusion by escaping into alcohol and possibly to some degree marijuana.

11.11.6.10 Sustainability of logging in Southeastern Cameroon/the Congo basin

Forest exploitation in the Sangha River Basin⁴³⁰ dates back to colonial times, accelerating in the 1920s when forest concessions were provided to private European concerns. Forests were cleared for coffee, oil-palm and cacao plantations and exploited for wild rubber, skins, meat and diamonds. Logging began taking off sometime in the 1970s, accelerating in recent times (Giles-Vernick, 2002). In 1995, four timber species represent over 60% of total timber exports from Cameroon: Ayous (*Triplochiton scleroxylon*) 30%, Sapelli (*Entandrophragma cylindricum*) 16.4%, Azobé (*Lophira alata*) 8.1% and Tali (*Erythrophleum spp.*) 6.2% (Verbelen, 2000). Vande weghe (2004) estimates that 17.2 million ha of Cameroon's forest were being exploited in 2002. In Cameroon and nearby Gabon, logging is moving into the interior of the country, the last old forests being under attack. In Cameroon, the cherished reserve Lake Lobéké has already been logged. Although Cameroon had 479 logging companies registered between 1998 and 1999, there were no more than 84 valid exploitation holders, of which 25 companies held 75% of the allocated areas with 15 year renewable leases (Vande weghe, 2004).

The Sapelli is of great importance to indigenous people. Medically, its bark and outer trunk have analgesic and anti-inflammatory effects used to treat head-aches associated with malaria, swollen eye infections and possibly as a bactericide. Large Sapelli are the unique host of the *Imbrasia (Nudaurelia) oyemensis*

⁴³⁰ The Sangha River Basin contains tracts of Southeastern Cameroon, southwestern Central African Republic (CAR/RCA) and northwestern Congo Brazzaville. Within this area, one finds the Lake Lobéké - Chute de Niki - Boumba-Bek/Dzanga-Sangha/Nouabale Ndoki *Tri-National De La Sangha* National Park created in December 2000, large protected areas in which Western donors and NGOs, along with political elites, have disposed rural communities from key resources they need for survival.

caterpillar, providing 75% of the protein eaten by Pygmies in the period when they fall from the trees locally called the “caterpillar season”. It is one of the best woods for pirogues and central supports for roofing in local homes (Forest Monitor, 2001).

Industrial exploitation of timber, often promoted under structural adjustment (SAP) and trade liberalization imposed by multilateral and bilateral creditors as a means of increasing government revenue (Ndoye & Kaimowitz, 1998; Forest Monitor, 2001), erodes the rights of local people in the Congo Basin who depend on forests. Forest tenure and traditional access rights are usually non-existent, which is exacerbated by the allocation of large areas of forest as timber concessions. The World Bank provided technical assistance helping to draft the current forestry law in Cameroon. There is concern that while the competitive tendering process introduced into Cameroon may reduce corruption, the bidding process is weighted 70/30 in favor of financial rather than technical merit that

“does not encourage the promotion of sustainable forestry management, and may indeed foster short-term profit-seeking over long-term sustainable forest management” (Forest Monitor, 2001).

Forest Monitor (2001) and Peterson (2003) do not believe that logging is sustainable, as being claimed by NGOs such as WCS and WWF, as well as donors such as the World Bank. Official government estimates suggest that sustainable log production levels are around 3.5 million m³/year in Cameroon, while actual log production is estimated to be between 4.5-5.1 m³/year (Forest Monitor, 2001). While forestry can lead to significant economic growth in areas with no history of forest exploitation, particularly since other indigenous economic activities are usually undervalued, the long-term ecological effects of this activity have not been properly assessed [Nouabalé-Ndoki Project (WCS), 1998]. Two of the most valued species in the region, Sapelli (*Entandrophragma*

cylindricum) and Sipo (*Entandrophragma utile*), have long growing cycles (e.g., age of harvested Sapelli using radiocarbon methods indicate 400-800 years old) and are being high graded, with second passes for less valuable species (Peterson, 2003) such as *bois blanc* from species such as Ayous (*Triplochiton scleroxylon*), used to make plywood, and Iroko (*Milicia excelsa*) (Barrado & DeGeorges, 1995) or Fraké/Limba (*Terminalia superba*), also used for plywood. In practice, long-term exploitation is based on alternate, less valuable species, as infrastructure develops, not on rotations of primary species. This may lead to economic growth, but the costs to sustainable development have yet to be evaluated [Nouabalé-Ndoki Project (WCS), 1998]. According to DeMadron and Forni (1997), on average one tree is logged/ha, a form of selective logging. According to Ford (2005),

“ ‘selective’ logging, in a silvicultural sense, is usually poor management, involving ‘high-grading’ that is, removing the most valuable species and individuals without concern for the species composition and growing conditions for the future forest. ‘Selection’ silviculture is the process in which individual trees are selected for removal from a stand, taking in consideration regeneration of those species (in other words, seedlings, saplings, and sub-commercial-sized individuals of that species are present and can be managed to grow to commercial size). Under selection management, the process of removing trees also contributes to creation of conditions, such as a seed bed, promoting desirable conditions for regeneration and growth of the future forest. Foresters categorize timber management into two principal strategies: even-aged management and uneven-aged management. Even-aged management deals largely with stands in which all trees are the same age. This is much more common in temperate and boreal zones than the tropics. Clear cutting and a few other techniques are examples of even-aged management. Thinning of even-aged stands can take out a commercial product but also leave a residual stand to continue growing. Usually, the best-formed trees are left, to concentrate the growing space on the most valuable product. Selection harvest is an example of uneven-aged management. Heterogeneous tropical forests are almost never clear-cut for their timber, because usually the majority of tree

species lack commercial value and many species have wood characteristics that make them very difficult to process into usable products”.

Vande weghe (2004) explains that “selective extraction changes species composition and the removal of giant trees 300-400 years, even 800 years old or more constitutes a skimming process that leaves no hope of reconstituting the heritage removed”.

Peterson (2003) points to evidence by evaluators regarding insufficient regeneration of Sapelli and Sipo. Likewise, Meder (1995) explains that preliminary carbon dating, aged wood cores of Sapelli and Sipo at 400-900 years, with no evidence that logging based on these two species is sustainable. Meder (1995) is concerned that with selective logging, “7% of the forest is cleared and approximately 20% of the stand is destroyed or damaged in the process”.

Many of the timber species fall into various threatened categories in the IUCN Red List of Threatened Species (Table 11.21) (see Chapter 10, Figure 10.6: IUCN species threat categorization.

Logging concessions tend to be broken into 40 units with 40 year rotation cycles, when the trees being harvested need rotational cycles of hundreds of years (Peterson, 2003). Research by DeMadron and Forni (1997) in Cameroon on Sapelli, Tali, Ayous and Fraké/Limba recommended an average rotation cycle for logging of 30 years, based on number of diameter classes lower than the Minimal Logging Diameter/*Diamètre Minimum d'Exploitabilité* (MLD/DME) for each species after deducting damage caused by logging on growth and on mortality. DeMadron and Forni (1997) recognize that this is a compromise on rotational period versus economics (loggers needing wood and government money). Growth rate estimates per species are based on forest surveys and growth rings by species.

Table 11.21: IUCN Red List classification of key tropical hardwood species from Cameroon/Congo Brazzaville

[Scientific Name]	Common Name(s)	Red List	USE
<u><i>Lophira alata</i></u>	Azobé/Azobe	VU A1cd ver 2.3 (1994)	Heavy durable construction work, harbor work, heavy-duty flooring, parquet flooring, railroad crossties
<u><i>Entandrophragma cylindricum</i></u>	Sapele/Sapelle/ Sapelli	VU A1cd ver 2.3 (1994)	Furniture and cabinetwork, decorative veneers, plywood, joinery, flooring, paneling.
<u><i>Entandrophragma utile</i></u>	Sipo	VU A1cd ver 2.3 (1994)	Furniture and cabinetwork, joinery, decorative veneers and plywood, boat construction.
<u><i>Milicia excelsa</i></u>	Iroko	LR/nt ver 2.3 (1994)	Suggested as a teak substitute. Joinery, boatbuilding, piling and marine work, domestic flooring, furniture, veneer, railroad crossties, cabinetwork, shop fittings.

VU = Vulnerable, EN = Endangered, LR = Lower Risk, (see Chapter 10, Figure 10.6:

IUCN species threat categorization,

http://www.redlist.org/info/categories_criteria1994.html (IUCN, 1994).

Source: IUCN (2004) for classification and WWF (2004b) for uses.

DeMadron and Forni (1997) also admit that it is difficult to predict future harvests - that is how well such trees will regenerate. ICRAF (2005) gives 50 years as the time when an Iroko can be harvested.

None of these estimates indicate how old these trees are at their maximum diameter/height. According to forester Reyes (2005),

"I forwarded your request to Dr. Frank Wadsworth, a retired forester here. He explained that unfortunately, there are no easy answers for your harvesting questions regarding the species below. Part of his reply follows: 'If the trees are produced

scientifically, harvesting is well deserved after they get to a size that is marketable. How much after is a matter of increasing value with stem size. The highest returns per year tend to be well after the trees reach the lower threshold of utilization. Harvesting trees at a minimum diameter is unwise, because much sapwood reduces the diameter of the more valuable heartwood. If this were to occur at 40 years, the volume of the tree at 80 years might be four times as great with wood value rising as the square of volume. It then resolves itself into a question of how long one is willing to wait.’ ”

Vande weghe (2002) raises concern that many question whether a second or third cut 30-40 years after the first is even profitable, “wood mining”. Forests are not clear-cut as in South America or Asia (e.g., for livestock, agriculture and logging) (see Chapter 5, Section 5.9.4.3, Deforestation in Sub-Saharan Africa’s dense humid forests today compared to the Amazon of South America). Since one to two trees are harvested/ha for a given species, the forest still appears structurally intact to a visitor. Economically, this is a form of mining rural Sub-Saharan Africa’s wealth for short-term gain. As discussed, equally devastating is the fragmentation of formerly impenetrable forests with logging roads, opening forests up to outsiders who are also mining rural peoples’ wildlife and other resources (e.g., ignames, honey and medicines) for short-term gain.

11.11.6.11 Certification for sustainable logging

No timber coming out of Central Africa has ever been certified by the Forest Stewardship Council (FSC) as being sustainable (Peterson, 2003), nor has certification been given to forest management operations, forest owners, manufacturers or timber traders in the Congo Basin (FSC, 2005).

In 2006, Transparency International ranked Cameroon 138 out of 163 countries, a number having the same score and thus ranking as one of the most corrupt countries in the world (see Section 11.6.3.2, Corruption). Key political and

military figures' involvement in commercial logging, from the President Paul Biya's son to generals, bodes ill for implementation of the forestry law, along with a transparent and accountable system of allocating concessions, transforming and exporting timber. Many of these political and military figures have been handed non-competitive access to logging concessions and then are known to have subleased to companies with a bad track record for playing by the rules. Linked to the neo-patrimonial client patron relationships described in Section 11.6.3 (Neo-Patrimonial Clientelism, The Big Man and "Cosmetic Democracy"), second only to oil in driving Cameroon's economy, the timber sector is characterized by the dialectic "‘Searching for power is to search for wealth, and searching for wealth is to search for power, because one leads to the other and vice versa,’" with a blurred line between public/private sector characteristic of such relationships (Forest Monitor, 2001).

In Cameroon, over 50% of the concessions not yet allocated for logging have been logged. Although the transformation of logs in-country provides added value, too many factories can result in over-harvesting to meet demands. The transformation capacity of factories in Cameroon soared from 1.2 million m³ in 1993 to 2.67 m³ in 1998 setting off a "race for timber" in which every means was permitted. Many of these factories are old European factories yielding mediocre products for valorization. Not just in Cameroon, but also throughout the region, management plans are falsified (Forest Monitor, 2001; Vande weghe, 2004), timber is transported illegally, including protected and under-dimensioned trees, and there is erroneous labeling of logs and felling of trees in prohibited areas. Globally, illegal timber is from 20-30% to 50% of total production (Vande weghe, 2004). The steady flow of reports of corruption in Cameroon's logging industry led the World Bank and Britain's Department for International Development (DFID) to confirm that in Cameroon "British and other international companies felled areas as large as 80,000 ha (200,000 acres) without permits; inspections

carried out by government-appointed observers in late 2001 and early 2002 show that almost every major logging company in Cameroon had acted wholly or partly illegally” (Transparency International, 2003). Many environmental groups are concerned that illegal logging could destroy as much as 67% of the Congo Basin’s forest in 50 years (Menezes, 2005). Searching the 2004 FCS website,⁴³¹ only Namibia, South Africa, Uganda, Zambia and Zimbabwe appear to have certified logging companies, but there are none from the Central Africa/Congo Basin area. Verbelen (2000) notes that the 1994 Cameroonian forestry law and its implementation has often been openly violated by concessionaires enjoying protection from high ranking authorities in Cameroon:

- “Less than 20 % of Cameroon’s unprotected forests remain free from logging development. Almost all logging in Cameroon is carried out in a very destructive way and illegal logging is a major issue...
- The log export ban (e.g., transformation of timber required in Cameroon) has not been implemented, ITTO (International Tropical Timber Organization) export figures for 1998 indicate that logs still made up more than 70 % of exports as opposed to transformed logs....
- The log export ban was lifted for two dominant species: Ayous and Sapelli. These exceptions allowed for much of Cameroon’s current logging trade to continue because these two species represented more than a third (>33%) of all logs exported in 1997. However, in August 1999, the government issued another set of guidelines that banned Sapelli exports while allowing for continued exports of Ayous and opening possibilities for the promotion of other currently ‘under-utilized’ species.
- Three subsidiary companies, all French owned hold more than 200,000 ha of concessions - in violation of the law. The companies are Sibaf-Bolloré, CFC-Thanry and Coron.
- 7 concessions (Thanry and Coron subsidiaries) were allocated through a discretionary process in 1996, violating the new legislation that called for a competitive and public allocation process.

⁴³¹ <http://www.fsc-info.org/>

- At least 21 of the 31 allocated concessions, *unités forestières d'aménagement* (UFA) did not go to the highest bidder. The Cameroonian government lost millions of dollars by not allocating concessions to the highest bidder.
- According to government records, during 1997-1998, 29 of 52 active licenses (56%) continued to operate even though the duration of their logging rights had expired”.

France is one of the largest bilateral lenders and aid donors to the region, French companies playing a significant role in regional forest exploitation (Forest Monitor, 2001). Does this imply that foreign aid is used as a political tool to buy influence for the donor country’s private sector?

Peterson (2003) provides additional support, referencing the name and official reports on illegal logging, possibly the majority of the timber coming out of Cameroon, believing this to be a form of neo-colonialism taking place in which African elites, especially governments, are in cahoots with European urbanites (consumers of wood) through intermediates, mostly French and German, but also Lebanese and Malaysian logging companies in the non-sustainable extraction of Central Africa’s most valuable resource, timber. Peterson (2003) calls this a “Reverse Robin Hood Scheme” in which the poor (rural communities) are robbed of both their timber and wildlife resources by outsiders, while NGOs more interested in fundraising and donor handouts, along with dysfunctional, corrupt, non-representative governments, promote misinformation that things are progressing. In essence, biodiversity, rural livelihoods and cultures are being destroyed under the guise of sustainable development, but development for whom? Biodiversity for rural subsistence economies represents wealth, empty forests being as serious a disaster for forest dwellers as a failed bank. Peterson (2003) argues that what we have is a clash of cultures, Western capitalized exploitation colliding with traditional hunter-gatherer cultures as the Western system expropriates biodiversity wealth from traditional societies, leaving them with little or nothing, while converting biodiversity wealth to cash that remains

with the urban/foreign elite. WWF in the name of forest conservation in Cameroon was given US\$ 2 million by the EU and another US\$ 3 million by European taxpayers after its 2001 conference on “Sustainable Management in the Congo Basin”. Peterson (2003) considers this a way of Europeans buying their own discount coupons for Central African hardwood that is cheaper than homegrown hardwood. Forest Monitor (2001) estimates that 45% of Cameroon’s timber is illegally harvested.

“The Centre for Environment and Development, a Cameroonian NGO, estimates that illegal timber accounted for about 45% of the country’s total timber production in 2000...Since May 2001, the British NGO Global Witness has been serving as independent forestry control observer in Cameroon, the only such post in the entire forestry sector of the Congo Basin. The impact of the mission, however, is still to be determined...Of the 25 forestry concessions Global Witness visited during its observer mission, almost all displayed serious legal discrepancies...The Société Forestière Hazim (SFH), a company owned by the Lebanese consul to Cameroon, was found to have illegally exploited 33% of its concession. The observer mission found that more than 20,000 ha of forest in the concession had been exploited in 2001, with a 25 billion CFA francs (US \$38 million) loss in earnings to the government and local communities...But the group also concedes that companies find it difficult to operate legally in Cameroon since permission to log invariably requires the payment of bribes...most of the companies known to engage in illegal logging have not been subject to sanctions sufficiently punitive to deter them. In other cases, legal sanctions, such as the revoking of logging licenses, have simply not been enforced” (Transparency International, 2003).

The Cameroonian government has “created a new unit to fight corruption in the sector. However, the fact that the unit was created within the under resourced forestry ministry – the very site of many of the alleged corrupt acts – has dented expectations that the new team will be effective” (Transparency International, 2005b).

Transparency International (2005a) indicates that illegal logging continues unabated in Cameroon. Studies by Greenpeace and Forests Monitor, by the British Department for International Development (DFID) and the IMF

“indicate the scale of corruption in forestry in Cameroon, as well as extensive tax losses for the state...two major groups of offence: illegal exploitation of the forest, in cases where there is no authorization; and anarchic exploitation, which refers to operations that are authorized, but where there are serious violations, such as uncontrolled logging, the exploitation of trees outside concessions, or inaccurate tax returns. The studies indicated that 41 out of 92 concessions are exploited illegally. One of the studies, which looked at 21 concessions, found that a tax loss of CFA 59.7 billion (US \$115 million) plus CFA 432 billion (US \$834 million) in damages over five years, amounting to around 25% of the government’s budget for 2004”.

11.11.6.12 Volume and value of timber from Cameroon/Congo Basin

The following offtake of timber are estimated, primarily by expatriate firms from the Congo Basin/Central Africa:

- Cameroon, ten European companies and one Lebanese parent company have 50% of the logging concessions in Cameroon. About 17.2 million ha logged. About 4.5-5 million m³/year exported (Peterson, 2003) [Vande weghe (2004) estimates 17.2 million ha exploited in 2002];
- Gabon, 327 separate concessions totaling 86,000 km² (8.6 million ha), the largest being 30,000 km² (3,000,000 ha) employing 2,000 workers. About 1,000 km² (100,000 ha) of forests degraded/year including in ecologically important “protected” areas such as Wonga-Wongue Reserve, the Gamba Reserve Complex and the Lopé Reserve. About 2.5 billion m³/year exported (Peterson, 2003) [Vande weghe (2004) estimates 12 million ha or 75% exploited in 2002];

- Congo Brazzaville licensing companies to log more than 50% of the 127,000 km² (12.7 million ha) of exploitable forests. About 1 million m³/year exported (Peterson, 2003). Tropical forests cover nearly 65% of Congo's territory. In the north of the country, the forest area has been divided into 21 logging concessions *unités forestières d'aménagement* (UFA) covering 8,984,749 hectares, of which eight have been awarded to logging companies, yet less than 10% of the total exploitable forest area has been exploited. Forestry is the second most important sector in the economy [Nouabalé-Ndoki Project (WCS), 1998];
- Equatorial Guinea licensing 30 companies, the larger foreign owned, to log 66% of the country's 22,000 km² of forests (Peterson, 2003);
- The Central African Republic licensing 9 companies to log 80-90% of the nation's 37,000 km² of forest in the southwest (Peterson, 2003); and
- The Democratic Republic of Congo licensing mainly German and Malaysian companies to log 10% or 118,000 km² (11.8 million ha) of its forests. About 1.5 billion m³/year exported combined from Equatorial Guinea, the Central African Republic and the Democratic Republic of Congo (Peterson, 2003).

About 10 million m³ from Sub-Saharan Africa's tropical lowland forests of the Congo Basin are exported annually, mainly to Europe and Asia, generating US\$ 100/m³ of exported wood or US\$ 1 billion/year in gross profits (Peterson, 2003). While the EU is the largest trading block (France number one, followed by Spain, Italy and Portugal) accounting for 64% of the round wood equivalents exported in 1999, China is the largest individual importer of timber from the Congo Basin (Forest Monitor, 2001). Similarly, FAOSTAT 2004 shows forest product exports from Central Africa/Congo Basin in 2003 valued at US\$ 1.1 billion (Table 11.22):

Table 11.22: Value of forest products exported from Central Africa/Congo Basin in 2003

Forest Products Exports	Value US\$
Cameroon	313,646,000
Central African Republic	47,877,000
Congo, Democratic Republic of	2,253,000
Congo (Brazzaville), Republic of	249,241,000
Equatorial Guinea	96,583,000
Gabon	367,021,000
Pulp & Paper (Mainly from DRC) Exports – Val	19,000
Total	1,076,640,000

Source: FAOSTAT (2004) with permission, UN & FAO.

Similarly, in 1999, the value of timber imported to Europe from the Congo Basin amounted to US\$ 600 million, Europe accounting for 64% of the world's import of tropical timber (Peterson, 2003). The only country in which logging has declined is in the Democratic Republic of Congo, due to the war, declining from 21 million ha in 1988 to 8 million around 2001, though talks were underway in 2002 to rapidly bring this back up to 33 million ha, in concessions given to Zimbabwe alone for its military aid (Vande weghe, 2004).

11.11.6.13 Let the Pygmies be the guardians of the forest

Although certain critical areas may need to be off limits, the Baka should be allowed to hunt and gather in the parks and protected areas, using traditional and or specified hunting techniques. The key is that they be allowed to carry out traditional subsistence hunting like the Eskimos in Canada and Alaska and that they be allowed to make a citizen's arrest of all outsiders they find in the forest so they can be turned over to MINEF.

The parks are for the most part completely undeveloped and parks in name only. Neither Cameroon nor the NGOs have the resources to police these areas. Meanwhile, fragmentation of the forests is opening them up to unsustainable exploitation for bushmeat and resources (Figure 11.3). Peterson (2003) provides some examples (see Chapter 10, Section, CITES Cannot Stop the Bushmeat Trade) specific to Cameroon:

- In 1990, 250 million kg/year of bushmeat were taken out of the 1,250 km² Korup National Park in southwestern Cameroon; and
- Tons of bushmeat/week are taken out of the Dja Biosphere Reserve and World Heritage Site in Southeastern Cameroon, helped by logging roads funded by the EU right up to the edge of Dja. Up to 150 elephants and 50 gorillas are killed each year within the boundaries of this reserve.

The Dja Biosphere Reserve is funded by the EU through Conservation and Rational Utilization of the Forest Ecosystems of Central Africa/*Conservation et utilisation rationnelle des Ecosystèmes Forestières en Afrique Centrale* (ECOFAC) operating in six protected areas in the region, including Congo Brazzaville and Gabon among others. The project was established in 1992 and has received US\$ 33 million to date (Forest Monitor, 2001).

In many cases, there is more game in the hunting areas protected by a safari operator than in the “Open Access” parks with little and/or inadequate protection (Barrado, *pers. comm.*). An option is to open up the undeveloped zones of the parks, allowing access to the people who have historically used them. Measures must be put in place to stop all outsiders. The past Director of Wildlife, Denis Koulagna (*pers. comm.*) believes that few tourists will ever visit these parks, most revenue from wildlife being derived from safari hunting. Even tourism in the more accessible savanna areas is quite limited. For instance, Bénoué National

Park, just south of Garoua with a beautiful camp and restaurant, receives only about 1,000 tourists per year (Mayaka, 2002). Thus, uneconomical “paper tiger” national park preservation areas make little sense in these isolated forests and many savannas, as opposed to dedicated natural areas co-managed with the local communities to meet the diverse array of wild products from these areas on which they depend for survival, while maintaining biodiversity and generating some income.

“If you allowed the Baka to continue to harvest and hunt the undeveloped parts of the parks they will not over use the zones (This can easily be determined and would become ‘their forests’ to protect and sustainably manage in collaboration with MINEF). The very nature of their travels requires a lot of walking and so they do not have the ability to bring back a lot of meat to sell (though this offtake should be monitored). Elephant hunting should be strictly limited, but is truly a historical heritage of the Baka (psychologically to be a Baka, he must be able to periodically participate in an elephant hunt linked to Djengi, the key forest god) (see Chapter 2, Section 2.1.8, Taboos as an Aid in Wildlife Management). I would even go so far as to propose that they be allowed to shoot elephants only when they are licensed and committed to bring out all of the meat. As a wild idea, a system could be set up to buy the ivory at the black market rates so you cut the middlemen out of the equation. When Cameroon finally gets its ability to sell excess ivory, like South Africa, the country will be able to capitalize on the stock of ivory from this regulated trade. Those hunters wishing to do this would be licensed and given strict quotas” (Greig, 2003).

With an estimated 30,000 elephants +/- 5,000 in Southeastern Cameroon (see Chapter 10, Section 10.7.2.1, “Enhancement” under the ESA linked to CITES, condemning more wildlife to die?, Enhancement Under the ESA as an Impediment to Conservation of Cameroon’s Elephant), there is no reason why annual meat quotas of elephants could not be provided to the Pygmies on a sustainable basis. Some additional concepts for consideration are (Greig, 2003):

- Do not allow any non-selective snare setting,⁴³² especially with steel cable, in these parks, but hunting only with true traditional means, nets, spears and crossbows (while allowing selective harvesting with shotguns could be considered). Further investigation and discussion is needed on this issue. (Vegetative snares might be considered, as this allows large animals to escape relatively unharmed. According to Wilcox & Nambu (2007) vegetative snares are legal in Cameroon but bushmeat cannot be sold commercially.);
- Allow the Baka to guide *chasse libre* hunters to “their forests” in return for wages (personal) and the daily fees (community) and ideally the trophy fee, which would be paid to an audited community account and strictly limited in what it could be spent on. Initially, put the Catholic Church or another involved non-profit organization on as a co-signatory for dispersal of funds to be spent on schools, teacher salaries and low cost pharmacies. Sooner or later, the local people must learn fiscal responsibility and this will come as more people from the community are sent off on scholarships to high school, university and technical schools with money raised by these funds;
- MINEF should deputize the Baka to confiscate the gun/bolt from any big game rifle found in their forest and confiscate any shotguns. They will do this if backed up by the *chasse libre* hunters. The guns would be turned over to the authorities in Yaoundé when the *chasse libre* hunter pays his trophy fees. (Note: This is happening with Dozo hunters on a World Bank funded program on the Comoé-Leraba Game Reserve in southern Burkina Faso; see Chapter 9, Section 9.8.9.1, Management of Comé-Leraba Game Reserve, Southern Burkina Faso);
- Officially deputize the Baka to destroy all wire snares;

⁴³² Studies around the Dja Biosphere Reserve suggest that there was a 25% loss of snared game from the meat rotting prior to being recovered (Vande weghe, 2004).

- License the Baka who wish to hunt elephants with a strict quota and means to sell the ivory for a fair price in a legal means;
- Shut down the forests to all outsiders not accompanied by the Baka. This could even be a licensed system run through the chief of the nearest village, allowing the village to get some profit out of the new system; and
- No roads would be allowed to be cut, so the safaris would be of low impact and the offtake sustainable. It would use a portion of the forest not being currently utilized by anyone legally and provide funds to drive advancement of the Baka into the 21st century while assuring its conservation and protection by the Baka. As they become more sophisticated in the services provided, they could up the fees charged to hunters and tourists (see Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders).

Additional ideas include:

- Help Baka to create indigenous organizations to lobby for their rights, including land and resource tenure;
- Assess acceptable hunting methods, traditional and modern as discussed above, for the Baka/local community to employ;
- MINEF erect mobile barriers on major roads in Southeastern Cameroon to control and regulate a licensed commercial bushmeat trade linked to a monitoring system at community level to assure sustainability;
- Control Logging Companies transporting bushmeat and poachers;
- Intensive management of Community Hunting Area, Cameroon/*Zone d'Interet Cynégétique a Gestion Communautaire* (ZICGC)s for legal and controlled commercial bushmeat trade by “rotational hunting”. Vegetative snares might be used for the commercial bushmeat trade, the offtake being

monitored, and a rotational system – like fallow, established to allow zones to recover;

- Work with *chasse libre* hunting community to devise ecologically and economically viable areas. This may mean readjusting boundaries between current land uses; parks, hunting blocks and ZICGCs to make them more realistic as to what they can provide economically and ecologically – no use having unused and currently unprotected areas that will likely be mined for short-term gains; and
- Small game farming. There has been some experimentation in Francophone Africa with raising small game such as the cane rat/agouti or grasscutter, a rodent *Thryonomys swinderianus*. Peterson (2003) suggests investigating this species and also giant Gambian rats (*Cricetomys* spp.) as the two best candidates, along with giant snails (*Achatina* spp. and *Archachatina* spp.). However, as noted in Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade, there are limited species available for such game farming and besides, as with fish farming, this will never negate the need to manage wild stocks of game in the forests or elsewhere (Bowen-Jones, Brown & Robinson, 2001 *In:* LWAG/DFID, 2002).

Vande weghe (2004) indicates that traditional territories occurred throughout the Congo Basin, extending 20-30 km beyond the farming lands (see Section 11.11.6.14, History repeats itself in new Mbam and Djerem National Park, Cameroon). With the relocation of communities along roads during the colonial and post-colonial eras, many of these traditional areas have been lost or disappeared into new landscapes (e.g., logging concessions, parks and hunting blocks), while “professional” bushmeat hunters are emptying areas formerly protected by communities – the notion of territory having become abstract. He believes that rather than eliminate these traditional hunting-gathering territories,

they should be resurrected and reinforced, using the community hunters to keep outside commercial hunters from abusing their resources. He also is a proponent of rotational hunting as practiced traditionally, in which monitoring would indicate when hunting success declines to the point that an area would be rested, while another zone within the community's territory would be hunted. The limiting factor will be population pressure.

These measures would provide a cash flow for the Baka and other groups, as well as a means to continue their traditional ways of hunting and gathering. The hunting licenses and other fees from *chasse libre* would benefit MINEF, and Cameroon would have more tourist money in terms of hotels, restaurants and travel.

Monitoring of the offtake would be a/the key to assuring that this traditional hunting is sustainable. Zouya-Mimbang (1998) believed in what she called auto-control by the local communities, which is similar to the pilot program of the World Bank in Burkina Faso *Gestion des Terroirs* (see Chapter 9, Section 9.8.9.1, Management of Comé-Leraba Game Reserve, Southern Burkina Faso) in which the goal is to have the local population manage, benefit from and protect "their" natural resources.

Giving the Baka/local community the feeling of pride and ownership over what they perceive as "their forests" is probably as important, if not more important, than just meat and money. Schmidt (1998) felt traditional user rights for the Baka to be critical, which is written into Loi N° 94/01, Article 29, (1). Zouya-Mimbang (1998) also supported this concept.

Being considered "second class citizens" and with few, if any, Baka with a university, let alone a secondary education, the future of the Baka and the many

Pygmy cultures across the tropical lowland forests of Central Africa looks bleak. Abilogo, *et al.* (2002) conclude that the “Baka must first establish greater economic independence from their Bantu ‘patrons’”. Almost all attempts to do so have relied on accelerating the process of sedentarization and engaging the Baka in permanent agriculture. Baka have no formal rights to the lands that they either presently utilize as hunter-gatherers or that could be used for agriculture. This needs to change. The notion of economic independence also assumes that new forms of social organisation can be developed that runs strongly counter to cultural norms (see Chapter 9, Section 9.7.4.2, Ignoring cultural constraints in institution building, LIFE, Namibia Nyae Nyae Conservancy and Section 9.7.6.4, CBNRM will not create a “middleclass” in rural Africa, LIFE, Namibia Nyae Nyae Conservancy). Moreover, the strength of Baka cultural values of “immediacy” might militate against development approaches relying heavily on benefits to be accrued in the distant future.

11.11.6.14 History repeats itself in new Mbam and Djerem National Park, Cameroon

As a sequel to this case study, in December 2003, two Cameroonian students from Tshwane University of Technology,⁴³³ both recent diploma graduates in nature conservation, were sent to an area north of the capital Yaoundé, around old German colonial capital of Yoko, to survey a hunting block buffer zone of the new Mbam and Djerem National Park (the old Pangar Djerem Game Reserve). This area is being developed, most likely with support from foreign donors, as though it was a primeval area on which humans had never trodden. This particular hunting block had been awarded to a banker⁴³⁴ in Yaoundé, who knew nothing

⁴³³ Armand Biko'o and Maliki Birosse Wardjomto – both master degree candidates in 2007.

⁴³⁴ On the positive side, Cameroonian students from Tshwane University in 2006/2007, in collaboration with the government and the village of Kong (Tikar ethnic group) on the western border of Mbam and Djerem Park, are establishing a *Zone d'Interet Cynégétique a Gestion Communautaire* (Community Hunting Area, Cameroon [ZICGC]) as a pilot program in which the

about wildlife, sustainable use, hunting or the local people. He wanted to make money. He also talked of opening the area to logging, with all of the potential consequences, as noted above, associated with fragmentation of the forest.

This area is inhabited by the Baveuk, Babouté and Bouté ethnic groups. These groups had been forgotten about by the French during the colonial times and for the last 40 years by the Cameroonian government. The area is a transition zone (ecotone) between forest and savanna, where both wildlife and plant species types are found from both biomes.

As the students were exploring, they came to a point where the local traditional hunting guide refused to go any further, even though it was well within the government designated safari hunting block. When asked why, the local guide said that he could go no further, since they were now entering into the hunting and gathering zone of another village. As with the Baka Pygmies (see Chapter 2, Section 2.1.4.2, Territory and wildlife management among the Baka Pygmies and other ethnic groups of Cameroon and Congo), the villages in the area had developed their own territories that they had managed for hundreds of years. The area was rich in game. When told that the people could no longer hunt or gather in the area other than 4-6 km into the forest from the village - an area already over-exploited - the people were visibly upset and saddened (Biko'o, pers. comm.).

There appears to have been no anthropological studies and no consultation with local people. With history repeating itself, common property systems are being

trophy fee and *ammodiation* (area rental) would go directly to the community (still to be negotiated) that would register as an enterprise and pay annual taxes. The community already recognizes the forest as belonging to them, has a land use plan (areas community hunts, versus non-hunting areas) and forbids bongo hunting or snare hunting. Details must be negotiated with government. In addition, the main river in the park is being zoned and various fishing communities empowered to manage and protect fishing stocks with their zone. As of 2008, the government retains the trophy fee, a major obstacle in assuring a buy-in by providing a significant profit to local communities; earning 17% of gross profit without trophy fee versus 32% with trophy fee.

replaced by centralized control that will create Open Access Resources to be mined by all comers. WCS is running this program (Gomse, *pers. comm.*) As Mayaka (2002) explains, “where state protection is faulty, wildlife is harvested under a *de facto* open access”. This will be exacerbated by the opening of the area for logging roads that will ease access by outsiders. Most likely, an expatriate safari operator/professional hunter will have come in with his territorial imperative given by a government acknowledged sub-contract from the banker. He will use repression against the local people. They will learn to hate white people, the game department and the government. At best, they will be poorer and marginalized from being cut off from a natural system that provided them with critical resources necessary to survive. At worst, they, like the Baka Pygmies, will be victims of eco-genocide.

The Garoua Wildlife College is training eco-guards recruited from the local community (Tarla, *pers. comm.*). The problem is that the laws are wrong. Will these eco-guards arrest their uncles, brothers, fathers and cousins? Vande weghe (2004) believes that anyone in such a community who would report another would be banned from the community, this only being feasible if acting against strangers, implying that for conservation to work, local community hunters-gatherers must be integrated into the management of such areas, as has been advocated throughout this book, to undertake legal harvesting of natural resources. Then the role of the eco-guards would be primarily to arrest outside interlopers and occasionally a local who breaks the laws. Modern conservation is alienating Sub-Saharan Africans from the concept of conservation, - something they have practiced for hundreds of years - but now government's can do it better. CBNRM mistakes are continually repeating themselves and no one seems to be learning from the historical past. Plans for co-management agreements between park authorities and local communities in Cameroon that allow access to various resources (e.g., land, pastures, water, straw, fish and various plant products)

(Tarla & Bachirou, 2004) could possibly begin changing relationships between these stakeholders, if based upon true negotiations and not mandates from MINEF.

All of this is happening even though, as noted, law n°94/01 of January 1994 on forests, wildlife and fisheries, Article 26, states that the social environment of local communities must be respected when creating new protected areas. They maintain the right to normal use if this does not compromise the objectives of the area. If they are stopped from accessing the area or moved, they must be compensated (Bauer, 2003). Murphree (1998) sums up the problems presented in this case study very eloquently,

“The institutional requirements of a local natural resource management regime...include social cohesion, locally sanctioned authority and co-operation and compliance reliant primarily on peer pressure. This implies a tightly knit interactive social unit spatially located to permit this. However, while social topography suggests ‘small-scale’ regimes, ecological considerations tend to mandate ‘large-scale’ regimes...Dissonance arises when larger ecosystem regimes are imposed rather than endogenous (coming from within the community). Such impositions in the form of ecologically-determined project domains often force together social units which have not negotiated between each other or worse still cut through existing social units. In so doing they concentrate on ecological sustainability at the cost of ignoring the institutional sustainability on which it depends”.

The feelings of local people towards Cameroon’s current approach to Western-driven conservation is well expressed by the extract from a motivational letter by a Jean Antono⁴³⁵ from Southeastern Cameroon to the Head of Department of

⁴³⁵ Jean Antono, C/O Kourai N. Bernard, *Ministre de la Fonction Publique et de La Reforme Administrative*, Yaounde, Cameroon, Tel: 237-950-88-51 To: Attie Botha Department Of Nature Conservation, Tshwane University Of Technology, B/Bag X680, Pretoria 0001 South Africa. Translation, words in parenthesis added.

Nature Conservation at Tshwane University of Technology in requesting a “Shikar Scholarship” to study nature conservation:

“I am a young Baka Pygmy, native to Southeastern Cameroon. The Baka are the people of the forest – we depend on it exclusively for our survival. It was given to us by ‘our God.’ However, today this forest is impoverished and divided into zones (hunting blocks, parks and logging concessions) that do not respect our way of life. As a consequence, we have been compressed to the edge of the roads next to Bantu villages living in indescribable misery with no ability to be heard by government.

I would like to be enrolled in the department of nature conservation, with a goal of learning what you ‘Whites’ mean by nature conservation and then return and sensitize my people about the dangers of destroying the forests and on the other hand regroup the Baka so that we ourselves can save ‘Our Forests’.

11.11.7 Case Study Bongo in the Congo (Brazzaville)

“The unrestrained corporate lust for energy, hardwood, medicines, and strategic metals is still a considerable threat to indigenous communities, arguably a larger threat than conservation. But the lines between the two are being blurred. Particularly problematic is the fact that international conservation organizations remain comfortable working in close quarters with some of the most aggressive global resource prospectors, such as Boise Cascade, Chevron-Texaco, Mitsubishi, Conoco-Phillips, International Paper, Rio Tinto Mining, Shell, and Weyerhauser,...to renounce their corporate partners, they would forfeit millions of dollars in revenue and access to global power...” (Dowie, 2005).

The non-Bantu in the northern forested region of the country are the Baka and Aka Pygmy ethnic groups, estimated at 30,000 inhabitants [Nouabalé-Ndoki Project (WCS), 1998].

The economy of Congo is based almost solely on the exploitation of its natural resource base. The petroleum sector dominates the economy. Tropical forests cover nearly 65% of Congo's territory [Nouabalé-Ndoki Project (WCS), 1998]. Of the 21.5 million ha of forests, approximately 50% of (12.7 million ha) are classified as productive forest suitable for timber exploitation, the remainder being flooded or semi-flooded forests or located in irregular terrain not amenable to commercial exploitation. In 1995, 37% of the total forest area of Congo was held in logging concessions, *unités forestières d'aménagement* (UFA), rapidly increasing since 1996. In the north, forests cover 17.3 million ha of which 8.9 million ha are exploitable (Forest Monitor, 2001). In the north of the country, the forest area has been divided into eight logging UFAs awarded to logging companies [Nouabalé-Ndoki Project (WCS), 1998].

“In northern Congo none of the active forestry units have a management plan, although some companies are now developing them” (Forest Monitor, 2001).

As noted in the Cameroon case study, many question the sustainability of mechanized logging in the Congo Basin, including Congo Brazzaville, along with consequential adverse social and environmental impacts.

One way to reduce the risks of relying on economic growth, based on single resource economies, is to diversify into other economic activities, such as tourist safari hunting (TSH), which depend on sustainable yields of forest resources. The positive aspects of forest exploitation *vis à vis* tourist safari hunting is that it takes advantage of the “edge effect” of secondary forest along logging roads. Certain game species, especially bongo (*Tragelaphus euryceros*), dwarf buffalo (*Syncerus caffer nanus*), giant forest hog (*Hylochoerus meinertzhageni*) and yellow-backed duiker (*Cephalaphus sylviculator*) appear to congregate along these edges, feeding on the lush vegetation that grows there [Nouabalé-Ndoki Project (WCS), 1998].

Vande weghe (2004) mentions elephant, buffalo, gorillas and forest duiker being attracted to secondary forests, but not chimpanzees and most other arboreal monkeys.

This “edge effect” along logging roads also simplifies the hunting method to be used and increases the success rate of the tourist safari hunter. Logging roads are used extensively by big game hunters to access and locate trophy individuals of many game species, game being taken within a few kilometers of these roads. The ease of this hunting, including the possibility of returning each day to a permanent base camp, is important since many of the clients able to pay for such activities are elderly and are likely incapable of enduring the rigors of the harsh forest environment [Nouabalé-Ndoki Project (WCS), 1998].

On recommendation of a 1995 field planning mission, consisting of the Wildlife Conservation Society (WCS) of Nouabalé-Ndoki, GTZ (German aid agency), Safari Club International (SCI) – represented by the principal author, and the Ministry of Environment and Forests, the Government of Congo granted Congo Safaris permission to undertake a pilot season in 1995-96 with a special quota of eight bongo antelope (MEF/NNP, 1995). Following the relatively successful 1995-96 pilot season, Congo Safaris signed a ten year contract with the Ministry for exclusive TSH rights to the Kabo UFA. Congo Safaris was responsible for:

- Education (public relations);
- Revenue sharing;
- Wildlife population monitoring and management; and
- Anti-poaching.

plus development of a land use plan agreed on by stakeholders delimiting tourist safari hunting zones, village hunting zones and protected areas, a community

sensitization program to eliminate indiscriminant snare hunting in favor of shotgun hunting and cessation of commercial bushmeat hunting for species of value to safari hunting (e.g., bongo, buffalo, yellow-backed duiker, giant forest hog and sitatunga). Giles-Vernick (2002) describes similar measures taken around the Dzanga-Sangha reserve and Dzanga-Ndoki national park in the nearby Central African Republic (CAR). Peterson (2003) discusses such attempts by WCS/CIB logging company (*Congolaise Industrielle des Bois*) in addition to hauling in beef from Cameroon, but questions the success of stopping everything from snaring to the circulation of large calibre rifles lent out by powerful men in the region. Tomlinson (2007) also raises the issue of government officials being behind most poaching in the nearby CAR, hiring Pygmies and providing them with rifles to kill elephants. Tourist safari hunting quotas were as follows (Stockenstroom, *pers. comm.*; SCI African Advisory Board, 1997) (Table 11.23):

Table 11.23: Trophy hunting quotas, Congo Safaris, KABO UFA

Species	1996 Kabo	1997	1998 Quota - 2
		Kabo/Pokola	Camps
Buffalo	4	6	10
Bongo	8	10	15
Sitatunga	4	6	10
Giant Forest Hog	4	5	8
Bushpig	8	8	12
Leopard	0	4	6
Blue Duiker	8	8	10
Bay Duiker	8	8	10
Peters Duiker	8	8	12
Gabon Duiker	5	4	6
Black-fronted Duiker	5	5	7
Yellow-backed Duiker	8	8	10

Source: Stockenstroom, *pers. comm.*; DeGeorges In: SCI African Advisory Board (1997).

11.11.7.1 Logging around Nouabalé-Ndoki National Park

In June 1999, a formal contract was signed between WCS, the logging company CIB, the Congo Ministry of Environment and Forests (MEF) and Congo Safaris called “Project for Ecosystem Management of the Periphery of the Nouabalé-

Ndoki National Park” (Peterson, 2003). According to Peterson (2003), this allowed CIB to more than double its concession area from 480,000 ha to 1.2 million ha, while the workforce increased to 1,200 workers (80% coming from outside the region), earning from US\$ 1.50-2.0/person/day. This resulted in an artificial community of from 10-16,000 residents in total, counting family, merchants and hangers-on, with bushmeat as their main source of protein.

Desiring quotas/limits as to the number of outsiders that could be employed in logging, in the mid to late 1990s violent demonstrations took place by the *Front National de la Sangha*, representing the forest community (Forest Monitor, 2001).

Prior to this doubling of the logging concession, CIB was paying US\$ 2.5 million (CFA 1.5 billion)⁴³⁶/year in taxes or 6.5% of the gross and US\$ 1.7 million (CFA 1 billion)/year in salaries or 4.5% of the gross (likely half of it going to a few highly paid expatriates) while making gross annual profits of US\$ 38 million (CFA 22.5 billion). Other reports estimate salaries in the logging concession at US\$ 30-40/month/employee with maximum annual salary outlays of US\$ 27,800 when the workforce was 695. Net profits to the company are difficult to obtain since other costs, such as transport and equipment depreciation, are not provided (Peterson, 2003). This compares to safari hunting with about 35% being paid over in the form of taxes and community support.⁴³⁷

⁴³⁶ CFA 589.95/US\$ in 1998 (Peterson, 2003).

⁴³⁷ In Chapter 9, Section 9.5.1, CAMPFIRE, Zimbabwe; 10% of the gross profits go to CAMPFIRE. In Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders; the community would get about 9.5% of the gross profits from hunting in direct benefits and salaries and the government 25.6% of the gross profits – a total of 35% of the gross.

11.11.7.2 Closure of bongo hunting

While a draft national safari hunting management plan for Congo [Nouabalé-Ndoki Project (WCS), 1998] was put together in collaboration with WCS, Congo Safaris and the government, in September 1999, the government, for no apparent reason, closed bongo hunting. Evidence strongly points to a WCS bongo researcher (Paul Elkan), who opposed hunting of this animal, especially expansion of hunting being proposed by Congo Safaris, by bringing in the well known and highly respected Haute Chinko Safaris from the Central African Republic (CAR/RCA). In June 2000, a meeting of stakeholders took place in Brazzaville to discuss the issue.

- Wildlife Conservation Society (WCS) represented by Paul Elkan;
- Congo Ministry of Water and Forests/MEF represented by Director of Wildlife, Marcellin Agnagna, Dominique Nsosso (Licensing) and Jean Pierre Ondaye (Congolese counterpart to Paul Elkan);
- Congo Safaris represented by Eric Stockenstroom; and
- Safari Club International/SCI represented by the principal author.

Mr. Elkan estimated that conservatively, there are 400-500 bongos in the area. Based on his presentation and the 1999 report, *Rapport Preliminaire Sur La Population De L'Antelope Bongo Dans 'UFA De Kabo, Nord Cong* (Elkan, 1999), he believed that the artificial salines in the hunting zone permanently attracted bongo from the nearby study area of Mombongo (Note: Congo Safaris believes there are other factors – see below – for the concentration of bongo and other wildlife in their area). There was concern that concentrating bongo by artificial salines risked to increase disease transmission, impact local vegetation and affect the bongo social system. It was recommended that bongo concentrate

around natural salines/bais and that no hunting should be allowed within a 3 km radius of a natural saline/*bai* (DeGeorges, 2000).

During April and May 1997, 18 bongos, five yellow-backed duikers and two sitatungas were found dead or dieing in the region of Nouabalé-Ndoki National Park and the Kabo UFA. Due to the difficulty of observing wildlife in the forest environment, it is believed that the mortality was much higher. Cameroon also reported at least five dead bongos. At the same time, in the peripheral areas south and west of Lake Lobéké National Park, Cameroon, the success rate for trophy bongo significantly declined. However, many of the safari operators found no dead bongo, leading some to conclude that possibly the bongo migrated to other areas where the food supply or other environmental conditions were more amicable (Wengert & de Gentile, *pers. comm.* both *In:* DeGeorges, 2000). Elkan (2000) found bongo to displace as much as 75 km.

The death and/or migration of bongo is believed to be due to a prolonged drought which weakened the bongo and was followed by an outbreak of biting flies, *Stomoxys* sp., which were able to reproduce through two to three lifecycles more than in wetter years, increasing their numbers. It is believed that this fly may have caused stress on wildlife contributing to general fatigue, malnutrition and susceptibility to a lung parasite identified by a visiting veterinary from South Africa (Huchzermeyer, 1997; Huchzermeyer, Penrith & Elkan, 2001). The South African vet believes that Congo Safari's artificial salines could have provided the vital minerals needed to survive these unusual conditions (Stockenstroom *pers. comm.* with Huchzermeyer),⁴³⁸ one of the reasons there were minimal observed mortalities in the hunting area.

⁴³⁸ F. W. Huchzermeyer, Pathology Section, Onderstepoort, Veterinary Institute (OVI), South Africa – who visited Congo to investigate dieoff.

Some people believe that the disappearance of bongo in Southeastern Cameroon was caused by Baka going on a “bongo poaching rampage” determining that if there were no bongo for the white man to hunt, he would leave and their forest would be returned to them (e.g., “revenge killing” as one sees among the Maasai in East Africa – see Chapter 9, Section 9.7.8.2, “Politics of despair”, Southern Maasailand “Tarangire Ecosystem”) (Mouncharou, *pers. comm.*). If this is even a minor contributing factor, it can show how desperate people, who had conserved the bongo and other wildlife for hundreds and thousands of years, can be turned against nature into exterminators through imposition of Western conservation models. Thus insensitive interventions by the West without the inclusion of the Baka and similar hunting-gathering groups, dependent on wildlife and other resources for survival, can actually turn them against conservation and result in destruction of the very resources on which they have traditionally been dependent. However, this allegation has never been proven.

Mr. Elkan, based upon the bongo dieoff of 1997, wanted only six bongos taken in the area (DeGeorges, 2000):

- Two Bongos in the West side of the Ndoki River, Kabo UFA;
- Two Bongos East Side of Ndoki River, Kabo UFA; and
- Two Bongos Pokola UFA;

Mr. Elkan also wished Congo Safaris to stop the use of artificial salines.

Mr. Stockenstroom explained that safari hunting in the Kabo UFA (480,000 ha) was sustainable, but that the Congo legislation of having the bongo on Annex I (Integrally Protected) was the problem. He also saw that one of the reasons hunting was closed is that certain groups were afraid of other safari operators coming in, resulting in an expansion of hunting. He felt Mr. Elkan’s estimate of

400-500 bongos to be extremely low. Within a 16 km radius of his hunting camp, he knew of at least 250 bongos based on known herds and solitary males (DeGeorges, 2000).

Mr. Stockenstroom explained that bongo is the flagship species for Congo. Hunting clients will not come to Congo unless this species can be hunted, nor will they pay top dollar (e.g., US\$ 25,000/2 weeks of hunting). All other species (dwarf buffalo, giant forest hog, sitatunga, yellow-backed duiker) are secondary and cannot be marketed without this “Flagship Species”. That is to say, the marketing of hunting will only succeed if a sufficient quota of this species exists to allow an economically viable safari industry to operate (DeGeorges, 2000).

Mr. Stockenstroom explained that eight bongos were the minimum to make his safari operation economically viable. He explained that with an annual quota of eight bongos, hunter success and trophy quality of the 28 bongos, which he had taken over the past five years, were excellent and thus, there was no justification to diminish the quota to six. Mr. Stockenstroom said that he would be the first to request a quota reduction, if he saw the quality of trophies declining, and/or felt that hunting was detrimentally impacting the bongo or other game populations (see Chapter 9, Section 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability). Furthermore, trophy quality, averaging between 29-30 inches, had been maintained, as well as hunter success – unlike in the area south of Lake Lobéké National Park across the border in Cameroon, where both trophy quality and hunter success significantly diminished from what appears to be a combination of over-harvesting (quotas not based on any scientific data, uncontrolled-poaching and over-shooting quotas in attempts to obtain good trophies for clients at all costs – shoot three bongo to get one good trophy), as well as the ecological factors described above (DeGeorges, 2000).

Trophy hunting is based on harvesting older males of the species (exception - gemsbok where females are also harvested as trophies), who have had the opportunity to pass on their genetic qualities. Based on a 2% offtake of the annual population for trophies, and a very conservative estimate of 400-500 bongos in the Kabo/Pokola UFA Complex, eight mature male bongos per year could easily be harvested on a sustainable basis, maintaining the economic value of the species through ensuring acceptable trophy quality by conservatively harvesting mature males. Nowhere in Africa has the harvesting of 2% of a population been shown to have an adverse impact on the biology of an antelope species (DeGeorges, 2000).

According to Mr. Elkan, the dieoff of the bongo was primarily males. In herding populations, one male may breed with many females. The success of a population usually depends on having a viable population of females, which appear to exist within the Kabo/Pokola UFA (DeGeorges, 2000).

Elkan of WCS could show no proof that safari hunting had been harmful to the bongo/game populations around the Nouabalé-Ndoki Kabo complex. In fact, the greatest population of game in the area was within Congo Safari's hunting area. WCS wished to place the cause for this as the use of artificial salines (salt licks), rather than the other factors mentioned above, such as revenue sharing, anti-poaching, land use plan developed by stakeholders establishing safari, traditional and logging company hunting areas, discouraging non-selective wire snaring in favor of selective shotgun hunting, village sensitization of hunting low value species and wildlife monitoring. WCS had no justification for recommending six over eight bongos, other than erring on the side of the Precautionary Principle (see Chapter 9 Section 9.2, THE CRITICAL LINK, CBNRM AND ADAPTIVE MANAGEMENT IN AFRICA, for definition). It was felt that two key issues that needed addressing were (DeGeorges, 2000):

- A Joint Monitoring Program between WCS/Congo Safaris/MEF, which would be used to help set annual quotas; and
- Addressing Transparency and Accountability in benefits to communities.

It was recommended that as part of the joint monitoring program, trophy quality be recorded for bongo and other trophy hunted species. A statistically significant decline in trophy quality over a three to five year period should raise a “Red Flag” of concern – “Threshold of Potential Concern”, or TPC, which could indicate anthropomorphic or environmental changes impacting the viability of the species.

Mr. Stockenstroom agreed to stop using artificial salines, for the right to have eight bongos on quota, but suggested that an experiment be established, where another area, outside his hunting area, would be established with artificial salines. Bongo would be monitored to see if they are drawn from his hunting area, where they are now concentrated. This would help determine which is most important, the establishment of artificial salines and/or the other factors in the integrated program established by Congo Safaris, such as the hunting block serving as a safe haven for bongo and other wildlife (DeGeorges, 2000). On June 21, 2000, a final meeting of stakeholders was held between (DeGeorges, 2000):

- Marcellin Agnagna, Director of Wildlife, (Ministry of Environment and Forests (MEF));
- Jean-Marcel Apesse, MEF;
- Paul Elkan, MEF/Wildlife Conservation Society (WCS);
- Eric Stockenstroom, Congo Safaris; and
- Principal author, Safari Club International (SCI).

Based on basic agreements from the previous meeting, an “*Arrette*” that is an official document, legalizing the hunting of bongo in the Kabo/Pokola UFA, would be produced for the Minister’s signature. This would then be published in an official government gazette, *Journal Officiale*. This would result in the bongo being moved from Congo’s Annex I (Integrally Protected) to Annex II (Partially Protected). This could take a few months. This would be preceded by an authorization to resume bongo hunting in the next week to allow safari activities to start soon. Draft copies would be emailed to Congo Safaris and the SCI Africa Office for their input (DeGeorges, 2000). Mr. Elkan asked Mr. DeGeorges why he did not come over and join the other side. Mr. DeGeorges can only suppose that this refers to the anti-hunting animal rights movement.

Bongo hunting never reopened. The key reasons appeared to be:

- The local WCS researcher being against the sustainable use of bongo;
- The safari operator believes that the logging company needed a “Green Label” showing sustainable timber management in order to market timber in European Union (EU) countries and cut an agreement with WCS to help provide this in return for their opposing hunting within their logging concession (Stockenstroom, *pers. comm.*). Similarly, Peterson (2003) believes that WCS was in cahoots with the German logging company CIB (*Congolaise Industrielle des Bois*). CIB used WCS as a front to push the idea of obtaining a “green label”, such as through FSC (Forest Stewardship Council), while WCS used CIB to support its publicity campaign that would help in fund raising and donor support. CIB could be pressured to push for the expulsion of Congo Safaris, as well as keep investigative journalists and other NGOs out of the area. CIB also gave up a mostly swampy, difficult to access 260 km² (of which only 160 km² was exploitable) Goualogo Triangle directly abutting Nouabalé-Ndoki

National Park, as a gesture towards conservation. However, Peterson (2003) explains it was the local people and not CIB, who really sacrificed, giving up their renewable resources, as all over the subcontinent, to neo-colonial Western conservation NGOs, in this case WCS. Attempts by CIB to obtain green label certification from the Dutch Keurhout Foundation⁴³⁹ were stopped when Green Peace challenged the award before a Keurhout Board of Appeal and the award was withdrawn (Peterson, 2003);

- Western donor funding [e.g., World Bank's/UNEP's/UNDP's Global Environment Facility (GEF), USAID's Central African Regional Program for the Environment (CARPE) in the Congo Basin, GTZ, etc.], which, though not sustainable, allowed WCS to create its own anti-poaching forces and development activities with little need for the private sector to help generate sustainable income to drive the program – or so they thought. Peterson (2003) contends that CIB contributes US\$ 150,000-200,000/year in kind to WCS, while donor/tax payer contributions from the West to WCS for this program amount to just under US\$ 1 million/year; and
- Convincing the Minister through trips to the USA and other politicking to close bongo hunting.

This is based on personal communications with the safari operator and personal observations of the principal author from 1995-2002 in dealing with this conservation program and the key stakeholders.

⁴³⁹ Kerhout Foundation ceased activities on December 31, 2003, the Netherlands Timber Trade Association (NTTA) taking over validation for sustainable forestry (Malaysian Timber Council, 2004).

11.11.7.3 Collusion between WCS, CIB and unsustainable logging/conservation

Western donors such as USAID, the World Bank and the Global Environment Facility (GEF) are diplomatic agencies working closely with national governments, making it difficult for conservationist NGOs taking their money to openly

“oppose government corruption or inaction, which is often the primary cause of environmental degradation in countries of the Third World; government backing of extractive industries in fragile forest areas is one of the most common outcomes...This has given rise to the ironic observation that the large international NGOs are allying themselves with forces that are destroying the world’s remaining ecosystems, while ignoring or even opposing those forces that are attempting to save them from destruction...Reluctance to oppose harmful practices (e.g., oil companies, miners, loggers, and pharmaceutical companies on indigenous lands) in foreign countries is even greater where the NGOs are largely out of sight of First World eyes (e.g., Congo Basin) and under the protection of governments that are unconcerned with protection of the environment” (Chapin, 2004).

Conservationist NGOs who had helped strengthen indigenous institutions to fight for their rights in the 1990s, have tended to join the other side, turning away from these indigenous groups when they begin fighting for land and resource tenure. These NGOs are afraid to stand up to the multi-nationals, governments, and Western bilateral and multi-lateral donors who are often in cahoots with each other (Chapin, 2004).

Peterson (2003) sees the relationship between WCS and the logging company CIB as coming up short,

“a conservation organization had formally disrobed and slipped into bed with a logging company:”

- Lacking transparency (no standardized independent assessments);
- Inappropriate funding (loggers and tropical wood consumers helping to pay for conservation); and
- Greenwash effect in which loggers exploit conservation groups for public relations purposes, without necessarily changing their ways.

There is no FSC green label to date, regardless of the public relations campaign, CIB lacking proof of both sustainable logging and wildlife management even though it is considered a key pilot program for the World Bank financed African Forest Law Enforcement and Governance (AFLEG) process (Peterson, 2003). Of grave concern is the rate of road construction around Nouabalé-Ndoki National Park. LaPorte and Lin (2003) found,

“using remote sensing imagery estimated that the total length of logging roads established...in the last 30 years was estimated to be more than 6,000 km (mostly from CIB, south of the park)—two times the total length of primary roads in the entire country”.

Logging roads can also be seen on the Cameroonian side (west) of the Sangha River in this imagery.

“Between February 2001 and April 2002, primary and secondary roads increased by more than 500 km in active concessions surrounding the Nouabalé-Ndoki National Park (south and north/northeast of park). In the Mokabi UFA (operated by Rougier) and in the Lopala UFA (BLP-BITAR) (north of park), 166 km and 176 km of roads were built during this time period, respectively. This translates into an annual rate of 0.05 to 0.09 km of logging road constructed per km² of forest” (Laporte & Lin, 2003).

In the north, a dense network of parallel secondary roads can be observed averaging only 850 meters apart (Laporte & Lin, 2003). This extensive road network has major implications, as discussed under the Cameroon case study above, not only for sustainable logging, but also for sustainable bushmeat harvests, providing easy and uncontrolled access for outsiders to mine the region's natural resources. The question that must be asked is at what point are the logging roads and secondary vegetation preferred by certain species excessive to the point of being detrimental versus beneficial to wildlife?

Peterson (2003) alleges that in 2002, CIB logging trucks were still transporting unlicensed hunters and making steel bullets in their workshops that could be placed in shotguns shells to shoot large animals, including elephant. During the mid 1990s, as many as 200-300 elephant were being killed each year by villagers living in the CIB concession land (Peterson, 2003). Reminiscent of the colonial past,

“eco-guards armed with automatic rifles patrol the buffer zone around the national parks, an activity many local people regard as a gross violation of their traditional rights. In some cases, elephant poachers have been hired as eco-guards in an attempt to stop them poaching. It has been reported in the past that these guards often intimidated local people, and allowed their former poaching colleagues to pass freely through checkpoints but confiscated local people’s small amounts of game. The system has created distrust and antagonism between some conservation workers and local people and, in certain places, has strengthened the position of some of the best-connected poachers who are commissioned to hunt trophy animals” (Forest Monitor, 2001).

Basically, CIB and WCS have taken over from the state; having created a fiefdom in which they control what information comes out of the area and who is allowed in (Peterson, 2003). Transnational companies operating as surrogate states, forcing local people to rely on them for basic services such as health and education, do not foster sustainable development that is equitable and lasting, the

standards for infrastructure and quality of services varying considerably (Forest Monitor, 2001). This is reminiscent of the colonial period when large concessions were given over to private companies.

This may be considered a form of neo-colonialism in which non-representative dysfunctional states give *de facto* rule to the private sector and NGOs, deferring their responsibilities from building roads, schools and clinics to policing and anti-poaching. It follows a trend in the region dating back to colonial times. Beginning in the 1890s, German and French colonial powers delegated administration of the Sangha River Basin, in which this case study and Southeastern Cameroon fall, to European concession companies for the purpose of extracting timber, game meat and skins, wild rubber, diamonds and establishing cocoa and coffee plantations (Giles-Vernick, 2002) (see Chapter 3, Section 3.1.4.1, Francophone colonial Africa, Central Africa). In fact, Vandeweghe (2004) is concerned that large forestry companies, and for that matter NGOs substituting for the state, is a relapse back into the paternalism so decried in the Belgium Congo and elsewhere in colonial Africa. It seems that little has changed.

11.11.8 Dzanga-Sangha and Empire Building, Central African Republic

The 1,220 km² Dzanga-Ndoki National Park and the 3,359 km² Dzanga-Sangha Special Reserve that serves as a buffer zone to the park, were both established in 1990. These protected areas, literally just across the border from Nouabalé-Ndoki, Congo, were started by the same person, Mike Fay, who helped secure donor funding⁴⁴⁰ and support for both the Central African Republic and Congo protected areas. The World Bank and IMF encouraged both forest exploitation to generate

⁴⁴⁰ Donors included USAID, U.S. Fish and Wildlife Service, GTZ (Giles-Vernick, 2002).

FOREX, as well as the creation of protected areas, local stakeholders losing in both cases, to foreign logging companies and Western NGOs. Similar to WCS and the logging company, CIB, in the Congo and reminiscent of the colonial period, WWF is the *de facto* manager of these areas supposedly in collaboration with government. WWF imposes rules on local people, limiting their access to the resources of the region, limiting where they can fish, what, how and where they can hunt, collection of other wild foods and farming. This forces people to poach, resulting in a lost opportunity to assure sustainable harvests (Giles-Vernick, 2002). Giles-Vernick (2002) argues, as during colonial times, WWF preaches a degradation narrative and the inability of local people to sustainably manage their resources, as the reason that foreign intervention is needed to save virgin forests which have been exploited and sustained livelihoods for hundreds of years. This is also useful for fundraising, such as from the IMF/World Bank who, as in Cameroon, pressured the Central African Republic government into creating these protected areas.

“Conservation efforts in the Sangha not only disrupted livelihood practices but also transgressed Mpiemu (dominant tribe in area) historical, cultural, and social knowledge, values, and practices concerning relations between people and environment embedded in doli⁴⁴¹” (Giles-Vernick, 2002).

Heavy-handed anti-poaching by military-uniformed guards, evoking the coercion and brutality of the colonial military past and concessionary companies’ guards, has failed, as one can argue, due to a conflict of cultures; the donor funded international conservation community’s vision of nature being worthy of protection for its intrinsic value and aesthetic pleasure, versus rural people who see these natural systems as storehouses of resources critical to their survival and economic livelihoods. Similar to the Baka of Cameroon, the Mpiemu believe that

⁴⁴¹ Among the Mpiemu ethnic group, “a category of historical and environmental knowledge and a way of perceiving and characterizing environments and the past”.

the government sold their forests to WWF, who is more interested in the future of wildlife than people. Local people have learned to hate whites, even wishing that someone kills them (Giles-Vernick, 2002).

Giles-Vernick (2002) describes conflicts between what U.S. Peace Corps and WWF Central African counterparts taught children - preserve the forest resources versus what they learn at home, to live off the forest in and around the Dzanga-Sangha National Park (see Section 11.11.11, Andohahela Lemur Reserve, Madagascar). She goes on to say, and this will be true in Madagascar and throughout rural areas of Sub-Saharan Africa, where people live subsistence lifestyles,

“it remains unlikely that Mpiemu (tribe) would ever adopt conservationist discourse of depletion and loss in the forest wholeheartedly and unequivocally. The forest was still a place of past and potential exploitation, as well as a source of materials (game, palm wine, building materials, and foods) that not only were crucial to their livelihood but also help them leave behind gendered, ethnic and generational persons and to transact social relations”.

Although this historian confuses “conservation” with the “preservationist policies” that most Western NGOs and donors impose on Africa’s rural communities, what she concludes is critical. Rural, subsistence-living Africans will likely not buy into “preservationist policies” that currently dominate. What these last two case studies have demonstrated is that if “conservation” in the Congo Basin’s forests and elsewhere is to be successful and thus, Sub-Saharan Africa’s natural areas are to survive current and future human population pressures, communities must be helped to sustainably manage and harvest the myriad of natural resources from these systems enriching livelihoods, as opposed to current policies that impoverish them and disregard entrepreneurialism.

The creation of local empires by conservation NGOs, at the expense of local cultures and sustainable natural resource management, is common across the subcontinent in the 21st century. As things currently stand, the way logging and conservation is being undertaken in the Congo Basin is not only not sustainable, but is destroying cultures, and is a major socio-ecological accident awaiting, if it has not already happened.

11.11.9 Kenya Wildlife Service (KWS) – Living on Donor Handouts, Negative Impact on Kenya's Wildlife Outside Parks

In East Africa,

“a general reluctance on behalf of most conservation authorities to implement community conservation policies fully reflects continued concern over loss of power, equated with loss of control” (Roe, *et al.*, 2000).

11.11.9.1 Donor driven conservation

The following case study shows how Western donor aid, along with influence by Western animal rights groups (Powys, 2003), is resulting in major habitat loss and the extermination of wildlife. As a result of the publicity gained from burning the 12 tons of ivory in 1989, as described in Chapter 10 on CITES, Kenya was the recipient hub of US\$ 150 – 250 million in foreign aid (see Chapter 10, Section 10.4.4, Leakey and Ivory Burning, Good for Kenya but No One Else). This large infusion of foreign aid allowed the Kenya Wildlife Service (KWS) to live independently of wealth generated from the sustainable use of its wildlife. This is reflective of donor- and fund-driven conservation budgets, in which expenditures were not related to obtaining added value from the resource, resulting in failure to reach financial sustainability in addition to alienating landowners from conservation. Costs to run the Kenya Wildlife Service (KWS) grew from US\$

11.5 million/year to US\$ 30.3 million/year in seven years, while income increased respectively over the same time frame from US\$ 5.9 million to US\$ 18.3 million, well below expectations, with 10-30% not collected (leaked), implying corruption. KWS is the most extreme example of a budget-funded agency responding to political imperative at the expense of conservation and operational effectiveness, with some 80% of the expenditure on non-park activities. KWS was given too much money too fast without the legal institutional or managerial capacity to absorb it, while landowners were given too few user rights and the most valuable use (safari hunting) was banned (Child, *et al.*, 2004a *In:* Child, B., 2004).

11.11.9.2 Impact of donor driven conservation on private lands

Wildlife populations plummeted outside parks owing to poaching and habitat loss as landowners, in trying to survive, were opting out of wildlife as a land use, an example of the negative power of state agencies (Child, *et al.*, 2004a *In:* Child, B., 2004), just the opposite of southern Africa.

The majority of Kenya's wildlife resources are found on private, group and cooperative lands and on Samburu/Turkana trust lands, outside protected areas. Though disputed by Richard Leakey (Leakey & Morill, 2002) as misinformation put forth by David Western (eventually Leakey's replacement in the Kenya Wildlife Service (KWS), it is commonly known that in the late 1980s/early 1990s, 80% of Kenya's wildlife lived on the 80% of the land lying outside its parks and reserves (DeGeorges, 1992a). Ouko and Marekia (1996 *In:* Juma & Ojwang, 1996 *In:* Emerton, 1998) estimate between 65% and 80% of Kenya's wildlife is outside National Parks and Reserves. Due to the antiquated preservationist policies of KWS, wildlife on private, group and cooperative ranches has been, and is still, seen as an Open Access Resource competing with livestock and of no

long-term economic value (DeGeorges, 1992a). While individuals and/or groups have title deeds to the land, they lack ownership over the land's most valuable commodity, wildlife. The drastic decline of wildlife and wildlife habitat since the early 1990s can be attributed to the pathetic protectionist policies of KWS, giving no incentive to ever-increasing rural people to maintain these ranches in natural systems. In April 2000, at CITES COP 11 in Nairobi, the principal author was shocked as he drove along the rift valley escarpment road from Nairobi to Naivasha. Down in the valley, what had been bush was now a neat quilt of squares, small farms expanding into what had been wildlife habitat less than ten years ago. If current preservationist policies of the Kenya Wildlife Service (KWS) continue in parallel with population growth and land hunger, one day soon only wildlife will be found in parks and protected areas (see Chapter 5, Figure 5.6: Movement of small farmers, mainly Kikuyu into former Maasai grazing areas in Kenya resulting in major conflicts in the 20/21st centuries).

Privately-owned Laikipia ranches, many owned by independently wealthy, often expatriate, landowners, continue to serve as strongholds for wildlife, including elephant and rhino populations. Laikipia is the only district where wildlife recorded an increase in numbers, up 12% between 1977 and 1994, with many of the other range lands seeing wildlife decreases ranging from negative 40-80%, and even important areas such as Amboseli/Kajiado District with a decrease of negative 15% and Maasai Mara/Narok District wildlife populations down by – negative 32% (Grunblatt, Said, *et al.*, 1995; Rainy & Worden, 1997 both *In:* Barrow, *et al.*, 2000) (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya).

Clive Aggate, Kifluku, Laikipia, Kenya

In the 1980s, Clive (*pers. comm.*) and George Aggate of Kifluku Farm, Laikipia Kenya, built a stone wall around their 3,644 ha (9,000 acre) farm and shot out all wildlife. They then approached the Kenya Wildlife Service (KWS) and explained that they had the right to control problem animals and since wildlife had no direct value to them, they were all problem animals bringing in tick borne diseases, and competing with livestock for pasture. Until they could obtain reasonable value from wildlife, they didn't want wildlife on our land, being no different than any smallholder, and one wonders why Sub-Saharan Africa's wildlife and its habitat is disappearing (DeGeorges & Pellek, 1991; DeGeorges, 1992a).

It may be a surprise to some that Clive and George are white Kenyans, but as they explained, they were behaving as would any smallholder, regardless of race, taking the necessary steps to survive. Eliminating wildlife resulted in decreased livestock dipping (in pesticides against tick borne diseases, etc.) from twice a week to once a month and significantly increased range carrying capacity (DeGeorges & Pellek, 1991; DeGeorges, 1992a). It is estimated that wildlife transmitted diseases cost ranchers US\$ 37/km² in Laikipia (Grootenhuis, 1996 *In:* Emerton, 1998).

Clive challenged the Kenya Wildlife Service (KWS) to take him to court. They refused, fearing that legally he would win the case and set a precedent for other smallholders in Kenya (DeGeorges, 1992a).

"I like elephant as much as the next man and I do what I can to protect them. But not when the bastards turn my fencing to spaghetti and eat up my entire corn crop", (British farmer in Kenya *In:* Rosenblum & Williamson, 1990).

Many Laikipia ranchers (e.g., Jasper Evans) recount with fervor how they might shoot lions as vermin preying on their livestock. They explain that if permitted to sell their lions as sport hunting trophies, they would be willing to allow some losses of livestock without taking extreme actions. This is not unique to Kenya, but typical of ranch country all over Sub-Saharan Africa (DeGeorges, 1992a). A male lion can bring as much as US\$ 12,000 or more in trophy fees alone, costing as much as US\$ 75,000 (Beukes, *pers. comm.*) to over US\$ 100,000 (Goldenberg, 2005)⁴⁴² for the total hunt.

In the mid-1990s, the principal author flew up to Laikipia with Lance Norris, the then Safari Club International (SCI) president, on a visit to Gilfrid Powys and Kuki Gallmann of Laikipia to discuss conservation issues in Kenya. The stone wall was still standing as a monument to the archaic centralized control of wildlife that is failing as critical wildlife habitat all over Kenya goes under the plow, being sold off by pastoralists who see no value in wildlife nor a future in pastoralism, to be engulfed by a wave of small farmers and commercial farmers who also see no value in wildlife. The policies of the Kenyan government are linked to its colonial past and to Western animal rights groups who wish to save Africa from the Africans. Allowing private land ownership on group, cooperative and private ranches, while failing to give full ownership of wildlife, allowing free-market forces within reason (e.g., ethical hunting, no canned hunting) to determine economic use, may be one of the biggest reasons why wildlife, but more importantly wildlife habitat, is disappearing in Kenya and Sub-Saharan Africa in general. As a result, landowners are either selling off the habitat to

⁴⁴² Charles Goldenberg, Premier Safaris (Booking Agent), premiersafaris@earthlink.net :Includes: 1) US\$ 54,000 daily rate for 24 day hunt, 2) US\$ 22,000 government trophy fees assuming two cats, three buffalo, 17 antelope, crocodile and hippo, 3) US\$ 2,000-6,000 community development surcharge on trophy fees, 4) US\$ 4,000 other government fees, daily conservation fees included (\$100 per day) US\$ 2,100 to US\$ 3,000; Hunting License US\$ 600; firearm/ammo import fees US\$ 600; trophy export -documentation fees \$300, 5) US\$ 8,400 observer fees, daily fee is from \$250 to \$450 and should average + US\$ 50/day government conservation fee, 6) US\$ 1,800 trophy preparations, 7) US\$ 6,000 plane charter to hunting camp, 8) US\$ 3,000 Hotels, etc. before and after hunt, 9) US\$ 3,000 International plane flights.

small farmers and wheat schemes and/or opting themselves for other land use (see Chapter 5, Section, 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya).

11.11.9.3 Secretive culling by Kenya Wildlife Service (KWS) living on foreign aid/donor handouts

Meanwhile, “there are more paradoxes to be found in Kenya. Whereas the Government opposes the culling (and hunting) of elephants, which is necessary in Southern Africa to avoid the grand scale destruction of forests and vegetation, Kenya Wildlife Service is engaged itself in culling operations. For example, 30 lions have been culled in the Aberdare National Park within the last 2 years in order to reduce predation on the rare Bongo antelope and the giant forest hog. This is done in great secrecy, because it is obviously not in line with the official position. As the scouts of the Kenya Wildlife Service (KWS) were unable to do the job, they had to call in a former cattle ranch manager to shoot the lions” (Anderson, 2000).⁴⁴³

Additional statistics from Laikipia rancher Gilfrid Powys are provided in Chapter 10, Section 10.8, THERE'S AN AFRICAN LION JUST AROUND THE CORNER). Until Kenya stops allowing Western animal rights groups, such as International Fund for Animal Welfare (IFAW) and Western donors, to control their wildlife policies, wasteful acts such as this lion slaughter and “revenge killings” by Maasai will continue along with a rapid loss of habitat as Kenyans opt for other land uses such as small and commercial farms.

11.11.9.4 Human/wildlife conflicts

Post independence in the 1960s saw many of the large scale ranches change hands with settled smallholders and cooperative or community ownership, in order to

⁴⁴³ Clive Anderson is pseudo-name of Rolf Baldus of GTZ's Tanzania's Selous Program. Article written for *Safari Time Africa* just before CITES COP 11, in 2000, Nairobi, Kenya. Now back in Germany at baldus@intafrica.com.

accommodate political pressure for land. The Laikipia Highlands have become a patchwork of marginalized small-scale indigenous farmers interspersed with sophisticated European ranchers. An estimated 30% of the Laikipia area has been lost to smallholders. It is estimated that there are 600-700 smallholders on the edge of Laikipia with 2 ha (5 acres)/smallholder managed as marginal agricultural lands which give significant crop yields one in every three to five years. People living under these management systems rely on remittances from family emigrating to urban environments in order to survive. Small farmers bordering cattle/wildlife farms experience major wildlife/human conflicts. Zebra and buffalo spend their days on the ranches and their evenings eating maize and other crops grown by the small farmers. Racial conflicts began to develop over this issue between the rich White rancher and the poor Black farmer (Powys, *pers comm.*). Other hidden costs to small-scale Sub-Saharan African farmers living next to wildlife are livestock/wildlife diseases and predation (e.g., lion, leopard, mongoose, hyena, cheetah, jackal, baboons), competition for grazing land, the cost of damage to boreholes by elephants, the emotive impacts of human death from wildlife (e.g., by elephant, hippo, buffalo and lion) and loss of food production (e.g., by raiding buffalo, elephant, baboons/monkeys, bushpigs and warthogs).

In the early 1990s, antagonism between the ranchers and small farmers became serious. To overcome this problem, the Laikipia Wildlife Forum was initiated in 1991 after Guilford Powys and Kuki Gallmann visited Zimbabwe to observe how benefits from wildlife accrued to local people living in rural Africa, “CAMPFIRE” (Powys, *pers. comm.*). This is a registered not-for-profit body made up of small farmers and large ranchers who have joined hands to resolve conflicts and to develop this region of Kenya (Powys, *pers. comm.*). A similar forum exists in the Machakos area south of Nairobi.

11.11.9.5 Potential value of sustainable use in Kenya

A Presidential Decree in 1977, with urging from the World Bank, banned hunting and effectively stopped consumptive utilization of wildlife in Kenya.⁴⁴⁴ Until 1990, only a handful of ranches were permitted to crop wildlife. In 1990, the Kenya Wildlife Service (KWS) introduced a limited pilot wildlife utilization program across six districts. In Laikipia, game cropping is licensed on 30 individual ranches and 11 community landholdings.

Game cropping generates very low returns to landowners estimated at US\$ 0.20 – 0.40/ha/year or US\$ 20-40/km²/year or just enough to cover the cost of disease transmission from wildlife to livestock, as noted above (Table 11.24).

Table 11.24: Return/hectare from alternative land uses in Laikipia, Kenya

Activity	US\$/Ha/Year 1995-1996	Return on capital % per annum
Wildlife Tourism	4.40 – 4.70	2.20
Game Cropping	0.20 – 0.40	0.30
Livestock	0.20 – 1.40	0.70
Agriculture (High potential lands only)	132.50 – 166.20	4.70

Source: Elliott and Mwangi (1997, *In: Barrow, et al., 2000*). Reproduced with permission of IIED, www.iied.org.

DeGeorges and Pellek (1991) found that most Laikipia ranches struggled to generate significant revenue from eco-tourism in the early 1990s, lacking the scenic beauty and game concentrations of parks like Amboseli and Maasai Mara.

⁴⁴⁴ Tanzania did not need any help from the World Bank to close hunting. Its first President, Julius Nyerere, took care of that. Hunting was closed in Tanzania from 1973-1984 (Bonner, 1993) or 1985 (Kibonde, *pers. comm.*) the reason being given because of corruption (Bonner, 1993), but also because Nyerere pursued a socialist agenda nationalizing the economy and discouraging the private sector of foreign investment (Lamb, 1982 & Bonner, 1993), as well as foreigner visitors (e.g., tourists) who might have negatively influenced what would become a failed experiment (Bonner, 1993). When hunting reopened, it was nationalized with TAWICO, the Tanzania Wildlife Corporation.

At the time, the London Rhodesia Company (LONHRO) had two ranches in Laikipia with inadequate returns from both livestock and eco-tourism to make them economically viable. As noted earlier, attempts to use the abundant Laikipia wildlife to feed refugee camps was rejected by USAID officials (see Section 11.8.3.1, “Food for Peace” or “food for poverty”, Western donor impacts on food production and wildlife management in Laikipia, Kenya). Thus, multiple use of wildlife, both consumptive and non-consumptive, seems to make sense on most of these ranches, likely combined with some livestock.

Laikipia landowners obtain less than 5% of the final value of wildlife products (Averbeck, 2001). No wildlife products are allowed to be sold as souvenirs in Kenya. Skins can only be tanned with hair off. Thus, many zebra skins have been shipped to South Africa, Botswana, Zimbabwe and Namibia and the added value of transformation from tanning and then retailing is obtained outside of Kenya. In 2004, the landowner was paid US\$ 100-200/Grade one zebra skins, which when sold on the tourist market, can sell for US\$ 1,000 dollars (Averbeck, 2001). In 2004, Grade 1 zebra skins in South Africa sold for R 9000/US\$ 1,450 when they could be found (Lewis, *pers. comm.*).

The biggest return to the landowner would be from trophy hunting, which is still closed. Elliott and Mwangi (1997 *In:* Averbeck, 2001) concluded that without significant change in economic incentives, wildlife will gradually be removed from all land in Laikipia, except where it supports tourism ventures or where the landowner has non-economic reasons (cultural, aesthetic) for conserving wildlife.

In 2003, some tourism in Kenya existed, but suffered after the embassy (1998) and resort (2002) bombings in Kenya and because of local political violence over the last few years. This violence peaked in early 2008, sparked by a disputed presidential election, but ultimately over populations growing at 3.9%/year, land

scarcity, high unemployment and rising ethnic tensions (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya). Landowners are struggling to get their rights back to own wildlife. It is believed that trophy hunting is where the biggest money can be made over the widest areas, many of which have little or no tourism value.

Comparison to South Africa and Zimbabwe

In comparison, Limpopo Province, which in 2000 contained 49.0% of all the exempted wildlife ranches in South Africa, depending on annual rainfall and thus offtake, the gross income from wildlife of extensively railed game averaged US\$ 6.73/ha/year (R32.32/ha/year)⁴⁴⁵ from 1995 to 1999, as opposed to farmed ostrich and crocodile. This was primarily from overseas and local hunting, venison and live sales, since only 7.9% of the game ranches cater to tourists [e.g., in the year 2000, for all of South Africa a total gross income of about US\$ 124 million (R 843 million)⁴⁴⁶ was generated on exempted game ranches⁴⁴⁷ of which only 4.7% of the revenue was ecotourism] (Bothma, 2005). The African Advisory Board (2000) valued South Africa's game industry in 1999 at US\$ 140,062,252, that included the overseas hunter (US\$ 38.4 million including taxidermy), the biltong hunter (US\$ 75 million), live capture and sales (US\$ 25 million), the venison market (US\$ 1.7 million) (see Chapter 10, Section 10.3.4, CITES Cannot Stop the Bushmeat Trade) and taxidermy. Similarly, Van der Merwe and Saayman (2002 *In:* Ebedes, Reilly, Van Hoven & Penzhorn, 2002 *In:* Bothma, 2005) estimated that overseas hunting has a gross value of US\$ 39 million (R238, 158, 000) in 1999.⁴⁴⁸ Allowing complete utilization of wildlife could generate large amounts of income for landowners and government (Table 11.25).

⁴⁴⁵ Between 1995-1999, averaged Rand 4.8/US\$.

⁴⁴⁶ Using annual average of about Rand 6.8/US\$ in 2000.

⁴⁴⁷ Exempted game ranches are high fenced and so designated by government so that game can be utilized year round at the discretion of the land owner

⁴⁴⁸ Use Rand 6.1/US\$ average for 1999.

Table 11.25: Actual and potential value of wildlife utilization in Kenya

	Actual (US\$ Millions)	Value (US\$ Millions)	Potential Value (US\$ Millions)
Game Cropping	0.34		1.00 – 2.00
Farming			0.75-1.50
• Crocodile/Ostrich	0.27		
• Butterfly	0.02		
• Bird Shooting	0.03		
Sport Hunting			5.00 – 15.00
TOTAL	0.66		6.75 – 18.50

Source: Tack (1996 In: Barrow, et al., 2000). Reproduced with permission of IIED, www.iied.org.

Similarly, Child (1995) found that the gross value of wildlife on game ranches in Zimbabwe where hunting takes place was US\$ 10.70-11.83/ha/yr compared to US\$ 4.24/ha/yr for cattle, while the net value was US\$ 3.53-4.48/ha/yr for wildlife and a negative US\$ -1.42/ha/yr for cattle on game ranches (see chapter 5, Section 5.12.7, Attaining Food Security through More Appropriate Land Use Options - Wildlife as a Land Use Option on Marginal Lands).

11.11.9.6 Kenyan conservation at a crossroads

Joel Ole Nyika, a Maasai from one of the group ranches (*Elang'ata Wuas*) near Amboseli National Park and a 2001 graduate in nature conservation from Tshwane University of Technology in South Africa, obtained a USAID consultancy to collect and collate views from communal and private landowners, which could be incorporated into the national wildlife policy. In this process, he helped in the formation of the Kenya Wildlife Working Group (KWWG). They had hoped to form a National Wildlife Forum of landowners, but were prevented through lobbying by the animal rights movement. His idea is that the kind of organizational structure needed to drive wildlife conservation on private lands is registered landowner wildlife forums at the local level (e.g., Laikipia, Machakos,

Narok, Samburu, Taita-Taveta and Kajiado). These regional wildlife forums would come together under an unregistered umbrella body, pooling their resources to lobby for policy change and to market their wildlife. His approach is that this can be done without registering the umbrella body to avoid over-regulation by government and the creation of a top-heavy NGO that is donor-dependent, as opposed to a policy-market oriented coordinating body controlled by the membership of the regional forums. His observation is that this umbrella body should be designed along the lines of the previous Kenya Pastoralist Forum (KPF), which was very effective in influencing government's pastoral policies (Nyika, 2003a.).

Nyika (2003a) compares the success of a decentralized structure to terrorist cells, while not advocating their tactics:

"Now you can reflect at what has been the success of similar decentralized bodies be it poachers networks, the mafia or terrorist groups. The only way to beat or destroy them is 1) Infiltrate them, 2) Go for the networks and destroy them - jailing them if they are the mafia, or a political movement, 3) Freeze their financial operations or assets, and 4) Legalize them as a means of regulating them".

In the case of Kenya, history demonstrates that banning wildlife use and fighting the poachers in the long-term, is doomed to failure. Legalization of wildlife utilization to the landowner is the only sure way to get a buy-in from the citizens and enforce law and order based on laws that are in the interest of the people. Currently the rule of law is forcing landowners to move outside the law in order to benefit from wildlife and/or to eliminate it in favor of other land uses.

Consistent with this, while the large landowners, mostly elites, have attempted unsuccessfully to use the law to open up the use of wildlife, the Maasai use another more effective tactic. As Nyika (2003a) puts it,

“the common Maasai way is different and more effective. If they have a disagreement with the government over revenues, they will spear one elephant or lion and increase the number if the government does not listen. Wildlife is the prime asset. Since the local communities are removed from an area to create a national park and the parks revenues are not shared with them, they kill the wildlife, make the park uneconomical and insecure for tourists, therefore pushing the government out of the tourism business, as a means of hopefully getting back their land; a logic sequence”.

Many people would call this “revenge killing” from the perspective of a Westerner or other outsiders, but to local people this is a just and appropriate reaction to an unjust imposition of inappropriate conservation policies.

When the Maasai were ejected out of Amboseli (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya), from the late 1950s until 1977, the rhino population dropped from 150 to 15, many found dead from Maasai spear wounds with the horns still in place. The Maasai were making a point (Rosenblum & William, 1987). Similarly, 75% of the lions in Nairobi National Park were speared in 2003 (see Chapter 10, Section 10.8, THERE’S AN AFRICAN LION JUST AROUND THE CORNER). It would be regrettable in the enlightened 21st century if they still have to make a point.

Unfortunately, such a grassroots movement/response by rural tribal people may well be required to push the government to reopen hunting so landowners can maximize benefits from wildlife on their property, “more so than some old white guys who outsmart each other to please any wildlife director who comes along” (Nyika, 2003a). While this may seem cruel and inhumane by Western standards, at this point in time in Sub-Saharan Africa’s development, the African way may bring about quicker results than diplomacy with non-representative governments,

especially when the “diplomats” at KWS appear to be in the fold of the animal rights groups and Western donors, who prefer welfare over private sector resource driven development. Until the ear of government listens to its citizens instead of those who control the purse strings, it is likely that such reactions by the rural communities will be more common than not.

The NGO which purported to help, but which in actual fact swallowed the KWWG (Kenya Wildlife Working Group), is the East Africa Wildlife Society (EAWLS) that is receiving funds through the Conservation Of Resources Through Enterprise (CORE, sequel to COBRA⁴⁴⁹) program from USAID. EAWLS tends to be more “green” (protectionist) than pro-sustainable use. Ali Kaka, the CEO of EAWLS, is a long time friend of Richard Leakey. Kaka is the person who led a campaign to make sure that the landowners’ national agency (National Wildlife Forum) would not be called “national wildlife forum”, but a mere wildlife working group under EAWLS - so that he could either kill it or make it irrelevant (Nyika, 2003a). Ultimately, the KWWG never became a national wildlife form, but just one of the many working groups [e.g., The Kenya Wildlife Coalition Group (KWCG) and the Kenya Forest Working Group] all housed in EAWLS. The KWCG is a coalition of animal rights preservationist groups made up of ten “green groups” with IFAW⁴⁵⁰ and the Born Free Foundation⁴⁵¹ being the most active (Powys, 2003). Norton-Griffiths (2007) also mentions active involvement in Kenya by the anti-hunting animal rights NGO, the Humane Society of the United States (HSUS)⁴⁵². Marginalization of a potentially effective landowner NGO in Kenya, supporting sustainable use by subsuming it under a larger body

⁴⁴⁹ Conservation of Biosphere Reserve Areas (COBRA), Kenya Wildlife Service, USAID Funded

⁴⁵⁰ International Fund for Animal Welfare (IFAW), PO Box 193 • 411 Main Street Yarmouth Port, MA, 02675, USA. <http://www.ifaw.org/ifaw/general/default.aspx>.

⁴⁵¹ Born Free Foundation, FREEPOST RCC1862, Horsham RH13 5BR; 3, Grove House, Foundry Lane, Horsham, West Sussex, RH13 5PL, United Kingdom.
<http://www.bornfree.org.uk/index.shtml>

⁴⁵² The Humane Society of the United States (HSUS), 2100 L Street, NW, Washington, D.C. 20037, USA Tel: 202-452-1100. <http://www.hsus.org/>.

controlled by animal rights groups, has been a common tactic to compromise their effectiveness and stymie the development of such movements (Nyika, *pers. comm.*).⁴⁵³

Sustainable use groups and animal rights groups are philosophically on the opposite ends of the spectrum. The current situation is akin to housing a church and a house of ill repute under the same roof. The weak will be absorbed by the strong; in the case of Kenya, the KWWG risks to be absorbed or neutered by the well financed KWCG animal rights coalition.

“The head of community wildlife service with instructions from the Director of KWS wrote a one sentence email letter to the USAID–CORE program director that he had instructed ALL his staff not to deal with Joel Ole Nyika in anyway - Reason nil. The only logical reason we can think of is that when the director Michael Wamiithi was appointed to head KWS from IFAW, I was on record saying his appointment is not healthy to country conservation efforts due his background as an extreme and radical lobbyist.

When the minister of wildlife called us to his office to seek our stand on bushmeat, we discovered that the director had already wrongly advised him to ban all game cropping exercises - as he alleged that this is the main cause of the (illegal)⁴⁵⁴ bushmeat trade. I strongly opposed that in front of the minister, permanent secretary-in-charge of ministry and the director. The minister backed us and asked us to write a petition paper to him on that, which we did. Two weeks later I was on BBC radio interviewed by Julian Pettifer on community position on wildlife conservation in Kenya, on which I said that local people would continue to remain poor unless they are allowed to utilize their wildlife especially through recreational (overseas trophy hunting) hunting. That the forces against hunting in Kenya are more of myth than real.

⁴⁵³ Email of November 17, 2003 from Nyika to DeGeorges, nyikajoel@hotmail.com

⁴⁵⁴ Formalized game cropping is part of the legal bushmeat trade.

The director was left with no option but to network with his animal right friends including USAID guys to 'isolate' me, but it was too late my - position is now the official position - even at higher levels - that there is need for 'a new responsible leadership in KWS' one that is not driven by international animal right NGO(s) and personality bigotry. Leakey came out of his cave and started his usual 'I -will- ask- the- whole- world- to -stop -funding- Kenya' if the minister will not stop interfering with the running of KWS...our friends outside Kenya should join us in putting more pressure to the Government to clear up the mess and restore integrity to our wildlife estates" (Nyika, 2003b).

Nyika (2003b) goes on to say, "bring economics (hunting) not Aid, Science not irrational emotions about suspending aid. Talk to your leaders in congress to urge USAID to abolish animal right positions and sponsorship".

In 2003 the Minister of Tourism sacked the entire Board of Trustees, Chairman Njonjo and Vice Chairman Richard Leakey (Powys, 2003), and has distanced itself from the endowment fund being pushed by Leakey in Kenya and Robby Robinson [former head of South African National Parks (SANparks)] in Uganda, both allied with the animal rights movement. This trust fund, similar to the bail out of Kenya with money after the ivory burn, would allow the Kenya Wildlife Service (KWS) and Uganda Wildlife Authority (UWA) to live off the interest of the trust, as opposed to living off their wildlife/natural resources. This would be a disincentive to valorize these resources, both for the government and the local communities, and would result in a continued and accelerated conversion of habitat to farms and over-grazed pasture. Everybody and everything that is associated with Leakey is being removed (Nyika, 2003c)

Certainly, there is concern that this endowment fund and continual propping up of KWS by the Western donors is a disincentive to stand on their own two feet, maximizing profits from wildlife resources through both ecotourism and safari hunting. As currently managed,

"the net agricultural opportunity cost of alternative land uses and earnings foregone to the Kenyan economy from maintaining nearly 61,000 km² of land under protected areas is \$US 203 million, some 2.8% of GDP and equivalent to support to 4.2 million Kenyans. The combined net returns from wildlife and forestry of \$US 42 million is inadequate to offset these costs, at the national or household level" (Norton-Griffiths & Southey, 1995 *In: Emerton, 1998*).

With no incentive for the landowner to conserve wildlife and its habitat - private, cooperative and group ranches where 80% of Kenya's wildlife are found - are rapidly going under the plow, often in areas marginal for agriculture (see Chapters three and Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small farmers, Amboseli and Maasai Mara, Kenya) to the detriment of the people and wildlife. This has to be one of the best examples world-wide of how foreign aid is a disincentive for good conservation by local people, while propping up dysfunctional government wildlife bodies and allowing animal rights groups [e.g., in Kenya, International Fund for Animal Welfare (IFAW) and the Born Free Foundation], who have already infiltrated Western donor agencies to infiltrate and impose Western urban values on a people who must still be allowed to live directly off their resources if they and their natural resources are to have a future.

Unless the wildlife coming out of these protected areas onto group ranches, along with resident game, can generate significant income for peripheral residents, not only does the carrying capacity of these protected areas risk to be significantly reduced, but Kenya's parks and protected areas will have a difficult time justifying their existence to a land hungry public. Innovative solutions such as natural areas being managed as "living factories", deriving as much economic revenue out of them as possible from all available resources through sustainable use and non-consumptive use, sharing this wealth with local communities, maybe even building community run enterprises that provide direct employment to

individuals from the community. Kenya must also strongly consider allowing the free-market on private lands, as in southern Africa, to determine how wildlife can be used as an economic resource. If Kenya's wildlife is mainly for expatriate "elites" such as tourists, researchers and NGOs, ultimately this wildlife and its habitat will be lost as a local, national and international heritage in favor of other land uses. There are just too many people and too much poverty. Also, by maximizing economic returns on wildlife from parks and protected areas, Kenya Wildlife Service (KWS) may ultimately break its bondage of living off international welfare from the donors and NGOs with concomitant obligations to adopt Western value systems, as opposed to African values when it comes to wildlife and conservation.

As Ole Nyika has said, we don't want donor handouts; we want to live off of our resources, including wildlife (Nyika, 2003b). The ideological battle goes on, as the Western animal rights groups appear to currently dominate Kenya and Uganda's eco-politics.

The Kenya Wildlife (Management and Conservation) Bill, developed by landowners in collaboration with members of parliament, passed the Kenyan Parliament in 2004, but was rejected by the Office of the President, based on one phrase in the bill which would have automatically lifted the 1977 presidential hunting ban. In essence, this bill would have returned wildlife to the landowners, allowing free-market forces to drive conservation on private lands in Kenya. Speculation has it that the animal rights paid people off to have this bill squashed.

The ideological battle continued into 2007, when the Draft Wildlife Policy of April 17th 2007 that would have permitted sustainable use and wildlife conservation as a land use was sidelined as the National Steering Committee turned to a single IFAW consultant to produce a final "Wildlife (Conservation and

Management) Bill, 2007" (dated May 10th). This bill undermines the Draft Wildlife Policy banning outright sport hunting, bird shooting and game fishing. IFAW cares little for the impacts on wildlife or rural poverty as long as consumptive use, especially hunting, is not reintroduced to Kenya. The underlying purpose is fundraising in America based upon its "Kenyan success story". Meanwhile, with offices in Nairobi, Western NGO groups such as WWF and AWF, as well as the IUCN that supposedly support sustainable use failed to react, fearing that they would be labeled as supporting "killing for fun" (Norton-Griffiths, 2007). What's new, as this might adversely impact their Western based fundraising efforts that sustain them, putting them in the same boat as the animal rights groups!

It is a known fact that Patricia Awori, daughter of Vice President Moody Awori, is head of the Kenya Wildlife Coalition Group (KWCG) (Croze, Sayialel & Sitnonik, 2006) that includes the IFAW and Born Free Foundation. The battle of Kenyans to control their wildlife from dominance by outside forces goes on. What is at stake is the habitat that houses more than 80% of Kenya's mega-fauna, private land, often - as with Maasai Mara - serving as rainy season dispersal and nursery areas. Let us hope that the rural landholders of Kenya finally get ownership of their wildlife back.

As Parker (2004) puts it, he is not sure if Western involvement in Sub-Saharan Africa's affairs is for the better, concerned that it may impede the evolution of the subcontinent evolving its own system of order out of chaos brought about by the abrupt change from colonialism to independence. Conservation policy is laid down by white people from America and Europe, coming across as crudely arrogant when animal loving organizations from the United States threaten Kenya with an anti-American tourist campaign if hunting is reopened (Parker, 2004).

11.11.10 Ranamafona Lemur Reserve, Madagascar

When interviewed the spokesman of the community explained,

“We realize that our forests are disappearing from unsustainable slash and burn agriculture, but we are torn between feeding our children today and having forests tomorrow. We were one of the last groups to resist the French. We are willing to collaborate with you, but anyone who tries to cut us off from feeding our families should be prepared for war” (DeGeorges, 1990b; DeGeorges, 1992a).

When the head of the USAID funded project, lemur researcher Patricia Wright was asked what development is, she responded,

“Development is taking USAID’s money and building school, roads and clinics in return for the people not cutting down the forest” (Wright, *pers. comm.*).

When she was asked what she would do when USAID’s project ended and there was no money to repair roads or buy medical supplies, notebooks and pencils, there was no response.

Due to international conservation politics, especially pressure from American conservationists not necessarily the desires of the local people, this area has been declared a park. About 72,000 people live in villages surrounding the park. Many of them cut wood in the park and graze cattle in the park, among other resources that are extracted. Now they cannot legally enter the park (Bonner, 1993). Time will tell whether the future will be collegial or confrontational,

whether they will be integrated into the management of the park or, as we have seen in so many Western funded programs, cut out of the park.

11.11.11 Andohahela Lemur Reserve, Madagascar

While a group of young girls sang for a USAID/government evaluation team a beautiful song which the project formal environmental education program taught them “Don't touch the forest, plant trees on the farm”, a simultaneous interview with another group of school children demonstrated that through non-formal education their parents were teaching them how to live in a harsh and unforgiving environment using the vegetation of the forest for food, medicine, shelter material and handicrafts, the children able to give local names for each key species. One young girl asked, “We're confused, why don't you want us to hunt and gather in the forest”! When a group of adults were asked how they viewed forests, their reaction was, “Forests are banks of farmland” waiting to be cultivated (DeGeorges, 1992a; 1992b).

Are we not prejudging, based on a Western urban bias by people who purchase their food in a grocery store, what is best for these communities and what it means for the long-term success of such a project? (see Section 11.11.8, Dzanga-Sangha and Empire Building, Central African Republic). Fairhead and Leach (2003) describe how mass media and environmental education in developing countries have tended to promote colonial and post-colonial state agendas, reinforcing culturally-imperial northern agendas. Today, NGOs and donor agencies are producing media and educational materials linked to Western research and policy values, often in conflict with traditional values and management systems in rural Sub-Saharan Africa. In some cases, where fallow periods are disappearing, they

may make sense, but in many cases preservation biases of international and urban-based elites, once removed from nature, placing their preservationist values on rural resource dependent people, will not be accepted (see Section 11.11.8, Dzanga-Sangha and Empire Building, Central African Republic).

Attempts were made to improve paddy rice culture around many of the national parks, yet rice cannot compare in nutrition to many of the crops, which people grow on the hillsides, in yield/hectare in energy and in protein (DeGeorges, 1993) (Table 11.26):

Table 11.26: Nutritional value, hillside versus paddy crops, Madagascar

CROP	ENERGY kcal/ha x 10 ^{6th}	CARBOHYDRATE g/100 g	PROTEIN g/100 g	PROTEIN kg/ha
HILLSIDE				
Manioc	8.2	38.06	1.36	37
Yam	5.7	27.88	1.53	107
Sweet Potato	7.4	17.61	1.57	96
Maize	3.2	79.60	8.80	82
PADDY				
Rice	3.2	79.34	6.61	72

Note: USDA (2004) data for carbohydrate and protein g/100g, U.S. Department of Agriculture, Food and Nutrition Information Center, www.nal.usda.gov/fnic.

Extracted from: DeGeorges (1993)

Improved fallow agriculture and other appropriate technologies must be considered to improve yields and soil conservation in rainfed areas (see Chapter 5, Section 5.12.1, Technological Solutions to Africa Food Crisis and Land Degradation). Rice is not the “save all”, even if it is an important part of the Malagasy diet. Similarly, nutrition was worse under a rice dominated diet, compared to the diverse array of resources obtained on the Senegal River's floodplains before the construction of dams (see Chapter 7, Section 7.10.8.1, Senegal River).

Speaking of diverse portfolios from the natural resource base, great potential exists to preserve the forests by helping local communities market resources from the forests for the aquarium trade. The exploitation of these minor forest resources is the responsibility of the *Direction des Eaux et Forêts* (DEF). Madagascar is a signatory to the Convention for the Trade in Endangered Species (CITES), which regulates trade in endangered species. Trade in wildlife and plants from Madagascar generates substantial income, which, unfortunately, remains in the hands of only a few major operators, many expatriate. These middlemen make the majority of the profits, no different from safari and tour operators in Sub-Saharan Africa.

As in trophy hunting in Sub-Saharan Africa, if local communities at the household level perceive substantial benefits from these products, they may be convinced to conserve Madagascar's remaining forests. Animals are generally collected by local villages, often children, and sold to agents acting on behalf of the operator (exporter). The price structure varies considerably from the collector through the middleman, to the exporter and final retailer. When compared to the overseas retail prices, it is clear that the percentage return to the local population collecting the specimens is in need of review. For instance, a *Mantella* spp. frog on average is worth FMg (*Franc Malagasy*) 75-200 = maximum of US\$ 0.42/frog, and for chameleon FMg 250-1,000 = maximum US\$ 0.56/chameleon paid by the collector to the rural community. They retail overseas for as much as US\$ 60 for a frog and up to US\$ 220 for a chameleon (BIODEV Consultants, 1993 *In: Development Assistance Corporation, 1993*).

In addition, from 1979-1988, 8,433.9 tons of medicinal plants were exported bringing close to US\$ 900,000 to Madagascar. There were nine exporters, two exporting *Centella asiatica* and seven who export *Catharanthus roseus*. *Centella asiatica* is a cicatrisant aiding in healing of wounds (Rakotobe, Razafindrabeaza,

Randrianasolo & Andriantsiferana, 1988 *In:* DeGeorges, 1993). *Catharanthus roseus*, “Rosy Periwinkle”, is used in cancer treatment. A problem, as with most products from Sub-Saharan Africa marketed raw, is the producer receives only a very small percentage of the value of the end product (Tables 11.27 and 11.28). As discussed in Chapter nine (Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders), there is a crying need for rural communities to develop overseas direct market links, cutting out the middleman, if they ever hope to receive a reasonable percentage of the value from these rural resources.

Table 11.27: Value of key medicinal plant, *Centella asiatica*, to peasant, middleman and end users

<i>Centella asiatica</i>	Price/Kg
To peasant	50 FMG fresh, 100 FMG dry = US\$ 0.06
Local Market	1000 FMG = US\$ 0.56
Price FOB	3,000 FMG = US\$ 1.67
Price of Extract in Medicine	15,088,044 FMG = US\$ 8,382
Price of Extract in Powder	20,839,000 FMG = US\$ 11,577

Source: Rakotobe, Razafindrabeaza, Randrianasolo and Andriantsiferana (1988 *In:* DeGeorges, 1993)

Table 11.28: Value of key medicinal plant, rosy periwinkle, *Catharanthus roseus*, to peasant, middleman and end users

<i>Catharanthus roseus</i>	Price/Kg
To peasant	300 FMG = US\$ 0.17
Local Market	500 FMG = US\$ 0.28
FOB	840.55 FMG = US\$ 0.47
Extract in Medicine as Powder	1,627,070,000 FMG = US\$ 903,928

Source: Rakotobe, Razafindrabeaza, Randrianasolo and Andriantsiferana (1988 *In:* DeGeorges, 1993)

Other key medicinal plants include *Pygeum africanum* whose bark is sent to Europe for treatment of prostate problems, *Rauvolfia confertiflora* whose bark is sent to Europe for treatment of low blood pressure, and *Voacanga thouarsii* marketed in Europe and used as an oxygenator, cerebral irrigator and as a

vasodilator. With the correct pricing structure, potential exists to significantly improve the livelihoods of local people in Madagascar, by living from the forests instead of eliminating them (DeGeorges, 1993). One can only hope this is where the world's conservation community wants to go. Olivier Behra (*pers. comm.*) of BIODEV, a local NGO, believed that helping the rural Malagasy market and receive added value for the riches of their forests was the only way in the long-term to save the forests, making them more valuable than farmland. This argument holds true across Sub-Saharan Africa for its natural systems.

11.12 TRADE NOT AID

In the long run, government-to-government foreign aid cannot bring about development. Foreign aid and policies must go into encouraging Foreign Direct Investment (FDI) and trade (see Chapter 13, Section 13.13, TRADE NOT AID).

11.13 AREAS WHERE FOREIGN AID CAN MAKE A DIFFERENCE – EDUCATION AND HEALTH

Few link health and education to conservation. In fact, many argue that improved health is linked to population increases in Sub-Saharan Africa, further degrading habitat. The authors argue that in fact improved health and education are the only hope for the survival of wildlife by offering insight, hope and most importantly, alternative lifestyles for rural populations looking to escape the over-crowded rural areas that can no longer sustain them. David Western, former director of the Kenya Wildlife Service (KWS) and long-term researcher of human conservation issues around Amboseli National Park, bests sums up his evolution in thinking over this issue:

“I began hunting as a kid. I was driven by a passion so deep that nothing else mattered, only the kill. Books and music held no

interest. I was hell-bent on becoming a great hunter, in the mold of George Rushby and others I met in southern Tanzania. Life was as cut-and-dried as firewood, all raw emotions with no thought of animal suffering. I didn't understand or care for wildlife laws either, except inasmuch as they granted hunters like my father license to kill a couple of elephants and rhinos a year, and antelope for the pot. We got on well with traditional African hunters—they directed us to elephants and we left them meat in return. Ivory poachers were another matter. They slaughtered elephants and robbed licensed hunters like us of big tuskers. I was far too callow to see the contradiction: they were following customary rights granted by God for their survival. We were interlopers, stealing their animals for our gratification...My father was deeply troubled by looming independence, the spread of meat poaching, and the thinning herds. The only hope he saw was to set aside National Parks and evict people. Before long, I was caught up in his fervor for protecting animals and fighting poachers. I swore to become a game warden...Wildlife had become a rallying point against colonialism that had denied Africans the rights to hunt. To the villager, the poacher was no thief. He saved the farmer's crops from elephants and gave him meat. I was still for parks, but saw the wrong being done to people in the name of what was right for animals. To my passion for animals was added a social conscience about human suffering too...The answers for now lay not in science or a passion for wildlife, but in securing the rights, opportunities, and skills that local communities needed for their development. This was the only hope of stemming population growth, diminishing pasture, poor health, and lack of education. Without addressing these problems, pastoralists living in prime wildlife areas were trapped in poverty and ill-prepared for alternative livelihoods elsewhere. If there was no hope for pastoralists, there certainly wasn't for wildlife" (Western, 2005 In: Lyman & Child, 2005).

To date, "by and large, relations between donors and governments still place much more emphasis on transfers of finance and technical assistance than on development and use of African institutional and human capacity" (Lele, 1990 In: Eicher & Staatz, 1990).

This may be slowly changing. In the World Bank funded Partner for Improvement of Management of Natural Ecosystems /*Projet de Partenariat Pour la Amelioration de la Gestion des Ecosystems Naturels* (PAGEN) in Burkina

Faso, only national expertise is employed and money exists for tertiary education, though it is currently being used to educate bureaucrats rather than youth from rural communities being empowered to manage wildlife (Pavy, *pers. comm.*) (see Chapter 9, Section 9.8.9.1, Management of Comé-Leraba Game Reserve, Southern Burkina Faso and 9.8.9.3, Community based natural forest management, *Gestion des Terroirs*, Burkina Faso).

Currently, more than 250 million Sub-Saharan Africans lack access to safe water, more than 200 million have no access to health services, nutrition is not improving, more than two million children a year die before their first birthday, more than 140 million youth are illiterate and less than 25% of poor, rural females attend primary school (World Bank, 2000).

Education and health (e.g., HIV/AIDS and potable water supplies) are two priority areas where an increase in aid is desperately needed and could make an enormous difference to the lives of millions of people in Sub-Saharan Africa and to conservation by the people. Sub-Saharan Africa's education crisis is stunting its development. Education has the potential to be a "stealth weapon" in the war against poverty. It can open doors to better health, increased income and independence. For the cost of just one of the Cruise missiles fired on Baghdad, around 100 schools could be built in Sub-Saharan Africa. The total amount of Western aid needed each year to put every child in the world into school is \$5.6 billion – a fraction of what was spent on the war against Iraq and equivalent to around three days' global military spending (Palmer & Kline, 2003). Between September 2001 and January 31, 2007, the war in Iraq, Afghanistan and other operations in the war on terrorism cost the U.S. Government US\$ 503 billion or about US\$ 1.9 billion/week (CBO, 2007). Investment in education and health will result in a decline in birth rates and HIV/AIDS. It will produce productive adults able to fit into a global economy as envisioned by the New Partnership for Africa's Development (NEPAD). It will help bring about democracy as a result

of awareness through education, the greater society demanding accountability from their leaders. Finally, it will produce people capable of finding “African Solutions to African Problems” that fit within the socio-cultural context of their societies, helping Africa catch up in development with the rest of the World. The only other real need is food relief, until middleclass societies can be created capable of commercially producing and purchasing their own food. Minor areas might include conservation and research in sustainable agricultural production – but much of this will happen on its own with an educated society.

If not squandered, the June 2005 cancellation of US\$ 40 billion in debt by the G-8 countries, impacting 18 of the poorest countries, 14 in Sub-Saharan Africa, could contribute in a small way in achieving Millennium 2000 goals of universal education and health care (McLaughin, 2005) (see Section 11.13.2, Health in Sub-Saharan Africa at the Beginning of the New Millennium; Chapter 12, Section 12.5, DEBT AND STRUCTURAL ADJUSTMENT POLICIES and Chapter 13, Section 13.12.3, Role of private sector versus foreign aid in economic development). In order to assure the best use of such money, Sachs (2005) believes in “aid harmonization” in which donors pool their money into common programs.

11.13.1 Education

Lester Brown (2003) of the Earth Policy Institute states, “It is difficult to have a functioning democracy with a largely illiterate population. Without literacy and a modicum of education, societies are often governed by superstition, making rational democracy difficult. For those who are illiterate, educational horizons and job opportunities are limited”.

“Environmentally responsible behavior also depends to a great extent on a capacity to understand basic scientific issues, such as the greenhouse effect or the ecological role of forests. Lacking this, it is harder to grasp the link between fossil fuel burning and

climate change or between tree cutting and the incidence of flooding or the loss of biological diversity. The deteriorating relationship between the global economy and the earth's ecosystem requires an all out effort to bring literacy to all adults in order to break the poverty cycle and to stabilize population.

Those who never attend school are also often outside the loop in acquiring basic information on nutrition and hygiene. They may have little exposure to HIV education and no understanding of how the disease is spread. Since vaccinations are often administered through schools, those who do not attend classes may not receive these basic shots. If schools provide free lunches, those who are not there will also miss out nutritionally. For the poorer segments of society, this is not a trivial deprivation.

For those worldwide, some 60% of illiterate adults are female. Where there is illiteracy, there is poverty. They tend to reinforce each other simply because illiterate women have much larger families than literate women do and because each year of schooling raises earning power by 10–20%. Illiterate women are trapped by large families and minimal earning power" (Brown, 2003).

Leistner (2004) notes that because the majority of people are uneducated in the Western sense, the political elite are the only ones in a given country who can relate to the outside Western world, in essence cutting off the masses from expressing their concerns and aspirations.

"A chasm exists between those whose mastery of a European language gives them access to the modern world's wealth of knowledge and opportunities",

this becoming even more important with the development of the information age and the internet. Education will be the equalizing force.

"One way of narrowing the gap between rich and poor is universal education. Under the World Bank's 'Education for All' program, any country with a well-designed plan to achieve universal primary education should receive financial support. The three principal requirements are that a country submits a sensible plan to reach universal basic education, commit a meaningful share of its own

resources to the plan, and have transparent budgeting and accounting practices. Monitoring 10 fast-track countries, singled out because they quickly submit solid plans for achieving the ‘Education for All’ goals, could provide useful information on what works and what does not work in various social situations. No child would be deprived of education because his or her parents cannot afford books and school fees.

The World Bank estimates that external funding of \$2.5–5 billion a year would be needed if the 47 poorest countries are to achieve universal primary education by 2015 (see Chapter 13, Section 13.12.3, Role of private sector versus foreign aid in economic development). Doing this in the 88 countries that are unlikely to reach universal primary education by 2015 would cost perhaps three times as much. Even if it were to cost \$15 billion per year, it would still be a bargain. At a time when personal computers give many schoolchildren access not only to books but also to the vast information resources of the Internet, having other children who never go to school is no longer acceptable” (Brown, 2003).

Guest (2004) argues that Sub-Saharan Africa must place an emphasis on improving standards of primary and secondary education before worrying about the quality of tertiary education, otherwise only the children of elite will be able to compete in universities. This is the case with South Africa, scoring last in the world out of 40 countries in basic literacy, with 80% of the primary schools failing to reach a benchmark that averages 6% globally, and last in the world out of 46 participating countries in math and science (Blaine, 2007). Yet if this testing separated out test scores of children from middle- and upper-class suburban schools from township/rural schools – no longer racial, but a socio-economic issue, South Africa would likely test in the top 10.

11.13.1.1 Educational situation in Sub-Saharan Africa at the beginning of the new millennium

The absolute number of illiterates in Sub-Saharan Africa was expected to increase from 132 million in 1980 to 147 million by 2000 (Alemayehu, 2000).

“Universal primary education is one of the Millennium Development Goals that is furthest away from attainment...When children remain sufficiently long in school, and in particular when girls receive adequate schooling, this increases economic growth rates, lowers fertility rates, leads to a reduction in child mortality and improves the educational attainments of the next generation. Adequate primary and secondary education is more than the empowerment of the individual, it is the empowerment of the society” (ILO, 2004).

Similarly, Sachs (2005) concludes fertility rates will decrease with increased education of girls and lower child mortality linked to improved economic conditions. Yet in Sub-Saharan Africa, fewer than six of ten primary-school aged children were enrolled in 2000, the lowest rate of any region and far below the 84% world average (see Chapter 12, Section, 12.6.2, Education and Structural Adjustment).

“Overall primary enrolment in Sub-Saharan Africa increased from 62 million in 1990 to 92 million in 2001; with the growth in the school age population over this period, the impact on net enrolment rates has been less dramatic, from 55% to 63%” (Commission for Africa, 2005).

It is estimated in Sub-Saharan Africa US\$ 6-8 billion/year is needed to assure universal primary education (Commission for Africa, 2005), about 1 months spending by the U.S. on the war in Iraq, Afghanistan and other operations in the war on terrorism (CBO, 2007). Therefore, although contributing, it is unlikely that the once off US\$ debt relief of June 2005 on its own will assure the attainment of SSA’s educational and health goals (see Section 12.5.2, 2005 Debt Cancellation).

Some 44 million children are out of school in Sub-Saharan Africa. School-based surveys for many countries show that household and domestic work and the family farm are major reasons for not attending, more so for girls than for boys.

Half of Sub-Saharan African countries show gross enrolment rates of no more than 26% for secondary education and 2.5% for higher education of school aged youth (World Economic Forum, 2004).

“Gender disparities and inequalities are wide: 11 (Sub-Saharan African) countries have gender parity indices of less than 0.76 (1 = parity) in primary school—Benin, Burkina Faso, the Central African Republic, Chad, Côte d’Ivoire, Ethiopia, Guinea-Conakry, Guinea-Bissau, Liberia, Mali and Mozambique. Gender issues are still treated as marginal in some of the poorer states where discrimination against schooling girls remains strong. Without sustained policy changes and resource commitments, it is highly unlikely that these countries will achieve gender parity and universal primary enrolment by 2015” (World Economic Forum, 2004) (see Chapter 13, Section 13.12.3, Role of private sector versus foreign aid in economic development).

“Half (50%) the SSA countries with data were spending less than 3.4% of national income on education in 2000—lower than the 4.1% average for developing countries. None of this is easy. The total costs to government continue to rise” (World Economic Forum, 2004).

“Several countries have enacted legislation for introducing or strengthening the provision of free and compulsory education, including Guinea-Conakry, Madagascar, Niger, Nigeria Uganda, Kenya and Zambia. South Africa’s constitution, adopted in final form in 1996, specifies 9 years of compulsory schooling making education for black South Africans compulsory for the first time...Primary school fees are still charged in 14 Sub-Saharan African countries unlikely to achieve gender parity in primary schooling in 2005 or even in 2015. Removing them would probably be the single most effective means of raising primary enrolments and reducing gender disparities in the short term” (World Economic Forum, 2004).

“Corporate support to education is still young, mostly from the oil community, not all of it voluntary...Africa receives the highest proportion of bilateral education aid of any region (approximately 27%), and more than the global average of education aid per capita, per school age child and per illiterate person. But it receives

less than the global average of aid per child out of school" (World Economic Forum, 2004).

"The 'Fast-Track Initiative' designed primarily by the World Bank is the world's new effort to match donor resources to effective national policies. Of the 18 countries accepted so far, 10 are from Sub-Saharan Africa—Burkina Faso, Ethiopia, Gambia, Ghana, Guinea-Conakry, Mozambique, Niger, Tanzania, Uganda and Zambia. The reduction of teacher salaries to improve affordability is possibly the most controversial issue in many African countries, jeopardizing efforts to improve education systems" (World Economic Forum, 2004).

"Countries with a Poverty Reduction Strategy Papers (PRSPs) – see Chapter 12, Section 12.5.1, The HIPC initiative - Half-hearted, Inadequate, Piecemeal Cancellation "Debt Relief") and an agreed 'credible' education sector plan are eligible to develop proposals to join the Fast-Track Initiative...so far, the 'Fast-Track Initiative' has not generated enough resources to close the expected financial gaps in the 10 African countries over the next few years. After raising high expectations that significant new funding would be mobilized for achieving the goal, has yet to receive substantial and specific international support for its activities" (World Economic Forum, 2004).

"Unless more funding is secured quickly, this instrument to help secure 'Education for All' is likely to be at risk. There is also a danger in thinking of the initiative as only a funding mechanism. It needs to be integrated with national reform processes and to help tackle fundamental structural issues of institutional development and reform in education" (World Economic Forum, 2004).

11.13.1.2 What kind of education?

As far back as the 1960s, French agronomist, and then Director of Research at the Institute national Agronomique in Paris, René Dumont (1966), was concerned about the appropriateness of the European model of "abstract education" in Africa. He believed that "schools should not detach the young schoolboy from his original rural world but train him so that he is in a position to modernize it".

He saw the villages and towns filling up with “educated”, but jobless and idle youth. He was worried that they would end up in shantytowns of the capitals as social parasites.

Unfortunately, in 2003, this is more the case than not, the “*bidonvilles*” or slums of Sub-Saharan Africa’s big cities being filled with disaffected youth flocking out of the rural areas to the bright lights of the big cities, seeing no future in the over-crowded ecologically degraded rural areas. When the principal author was an advisor to the Gambia River Basin Development Organization (OMVG) in the 1980s in Dakar, Senegal, he kept his apartment opened to Peace Corps Volunteers living in isolated rural villages. He was visited by many volunteers based in rural Gambia. One key observation they all made is that the education afforded rural Africans, while fine for someone living in London, basic reading, writing and arithmetic - in no way taught these youth how to better live with their environment, improving their lives through adopting modern agricultural, soil conservation, range management and animal husbandry technologies. Ironically, even today, most African Anglophone countries rely on the standardized Oxford Exam to determine if their youth are prepared to go out into the “real world”. René Dumont (1966) explained that it is sheer stupidity to insist that a rice cultivator’s child in Betsileo (Madagascar) be educated in the same way as a worker’s child in Paris. “It was already a grave error to be teaching the French peasant in Lozere and the metallurgist in Lorraine absolute uniformly”. As the Peace Corps Volunteers explained,

“when these kids finish school, they look around and say, ‘there is nothing for me out here so I am heading for the capital of Banjul.’”

Without a vibrant private sector or industry, what awaits these youth is unemployment, drugs, crime and prostitution. What then is this appropriate education and is this what we are training Africa’s youth for? What else is

needed if modern education is to be of any value? Is it not foreign investment in industry and technology to absorb these youth, both those who choose to remain in the rural areas farming, as well as those who will work in industries that transform the products they will produce?

Africa is in a dilemma of over-populated and increasingly degraded rural areas and growing urban slums (see Chapter 5, Section 5.7.5, Food Security and Urbanization in Sub-Saharan Africa). What is the solution?

This book certainly does not have all the answers, but it will put forth ideas. Appropriate education is a key to finding the way forward, along with industrialization. Thus, appropriate education needs to train youth in rural areas to better and more intensively manage their natural systems, which are rapidly degrading through antiquated traditional extensive management systems, overwhelmed by over-population. Appropriate education needs to train youth in practical skills from accounting and marketing to electronics, surveying, engineers and information technology – skills that will prepare the bulk of Africa's youth for employment in what need to become growing urban centers of trade and industry.

Yes, reading, writing and arithmetic must be the basis of all education, regardless of one's training, but schools, as in South Africa should be more applied, teaching practical skills that can be used in managing natural resources, farming, in industry or information technology. However, standards must be maintained. Sub-Saharan Africa needs more vocational secondary schools where a child can learn about the latest agronomic and range management techniques in rural areas, or be trained in sustainable wildlife, timber and fisheries management, or in mineral exploitation and refinement – life skills that will enable them to fit into a modern

society that will more and more require the use of intensive management systems to develop rural and urban economies.

The “bright lights” from these schools can go on for advanced university training, while the high school graduates from these secondary schools should be prepared to join their father on the farm to improve agricultural production – if that is their choice, and/or to be absorbed into trade, industry and IT in the urban settings. The Commission for Africa (2005) advocates carrying this on through tertiary education, advocating, “a long-term program of investment is needed, both to revitalize African universities and to support the development of centers of excellence in science, engineering and technology, including African institutes of technology”. It is believed that South Africa’s first world tertiary training institutions have an important role to play, initially in taking the place of traditional European and American universities to provide a more relevant and cost-effective education and eventually, by partnering with institutions on the rest of the subcontinent, to raise their standards of education.

In September 2005, the Partnership for Higher Education in Africa (consisting of Carnegie Corporation of New York, as well as the Ford, MacArthur and Rockefeller Foundations and the William and Flora Hewlett and Andrew W. Mellon Foundations) pledged an additional US\$ 200 million over the US\$ 150 million already invested in 2000 to improve education in 40 universities in the seven countries of Nigeria, Ghana, Kenya, Mozambique, South Africa, Tanzania and Uganda. An investment in higher education will serve as a basis for laying the foundation for democracy and economic development (DeCapua, 2005b; Schoetzau, 2005).

Meanwhile South Africa and the rest of Sub-Saharan Africa must get their primary and secondary education up to par. Even South Africa has a major

challenge in getting its township and rural primary and secondary schools up to international standards to be able to compete in its international quality universities. However, a word of caution to South Africa - it cannot afford to turn First World universities into Third World universities by dropping standards to the level of graduates of inferior education from townships and rural areas. Not only would it be a disservice by producing university graduates whose degrees would no longer be recognized globally, it would risk creating a dysfunctional society unable to compete in the global market place.

The Commission for Africa (2005) also supports various mentoring/apprenticeship programs. For example,

“the National Open Apprenticeship Scheme (NOAS) in Nigeria attempts to link education with the workplace through practical training under master craftsmen in key industries such as docking and railways. Since its inception in 1992 over 600,000 young people have been trained in over 80 trades, 400,000 of which have started their own micro enterprises” (Commission for Africa, 2005).

The Commission also believes that entrepreneurial skills need to be part of the educational curriculum in secondary schools, since unlike the past, few graduates will have the opportunity to work for government. Such programs can link farmers, businessmen, fishermen, loggers, IT technicians and engineers to secondary and tertiary educational institutions (see Chapter 5, Section, 5.12.6.1 South Africa, an Emerging Model in Public Private Partnerships).

Part of this problem is because of Sub-Saharan Africa’s failure to develop economically, creating a demand for their skills, and part is because there are a surplus of trained youth, many who have limited practical skills – how many history majors, artists and social scientists can Africa employ? Yes it needs these

skills, as well as trained doctors and veterinarians, but it needs lots more people able to “dirty their hands”, but trained in the latest technologies to increase agricultural production and transformation (agronomists, plant scientists, soil scientists, range managers, agri-engineers), to manage Sub-Saharan Africa’s forests and wildlife (foresters, wildlife and fishery biologists), to extract and then transform its mineral wealth (geologists and engineers), to build its highways and other infrastructure (e.g., engineers, designers, architects and surveyors), to run and operate its IT centers, and to run, operate and market the businesses (e.g., MBA’s, accountants and entrepreneurs). Everyone should be exposed to the historical past so that the atrocities of history do not repeat themselves (e.g., WWI and II, the genocides of Nazi Germany, Rwanda and Darfur, segregation in the USA and Apartheid in South Africa) and the wonders of art, literature and philosophy, but the bulk of the training needs to be technical and applied in the fields of resource management and transformation, the sciences, business, engineering and geology, and agriculture/agro-industry.

As René Dumont (1966) explains

“along with its bookish emphasis totally detached from nature – itself a book one must learn to ‘read’ – French education also develops an antipathy towards manual labor...a child leaving school is contemptuous of his younger brother, still hoeing the ground”.

If that younger brother is trained in the latest agricultural and extractive mineral technologies or in sustainable timber, wildlife and fisheries management and he can earn a decent living from the sustainable use of these resources – then as in America, a plumber or electrician can make more than a white-collar worker. Not everyone in Sub-Saharan Africa wants to be a bureaucratic stuck behind a desk in some mundane boring job with limited opportunities for career advancement, where pay is so low that corruption becomes a way of survival.

Finally, in rural areas where women are the backbone of traditional food-production agriculture and men into cash crops (sometimes women move into this arena), as in rural America in the early 20th century, an equal emphasis needs to be placed on training and educating women and not just men (Dumont, 1966; Buvinic & Mehra, 1990 *In: Eicher & Staatz, 1990*).

Adult, education – yes there is likely some value in this, but the future is in Africa's youth and if education is practical, especially in the rural areas, why can't these youth serve as “agricultural extension agents” to their families and villages, where governments, given limited resources, are unable to completely fulfill this task. In less than a generation, with appropriate education, as we have in America and Europe with our vocational schools, these youth will be the adult workers already trained in appropriate technologies and not needing “adult education”. Then there is the age old adage, “you can teach an old dog new tricks” so work with the puppies.

Finally, this education must not be for just a privileged few, otherwise Sub-Saharan Africa will be back into creating an educated minority elite who risk to take advantage of a backwards majority. It must be universal and available to everyone – the majority of the populace, and of equal quality, regardless of neighborhood. This assumes that education goes concurrently with economic development and creation of an educated middleclass that will bring political stability, be ripe for evolution into multi-party democracy, see the value in family planning and be aware of how to avoid the ravages of HIV/AIDS. Currently, this is not happening and Sub-Saharan Africa is losing an estimated 70,000 Africans/year fleeing the continent for better opportunities in developed countries (Commission for Africa, 2005), a brain drain which the continent cannot afford. Today one in three (33%) African university graduates works abroad, many educated with Western donor funding (Sogge, 2002a). According to UN statistics

indicating that professionals leaving Africa to work abroad increased from (Sogge, 2002a):

- 27,000 from 1960-1975;
- 60,000 from 1985-1990; and
- 200,000 from 1990-1999.

Other estimates are higher. There are approximately 640,000 African professionals in the U.S., with over 360,000 having PhDs (Sankore, 2005). In total an estimated 30-40% of college graduates from Sub-Saharan Africa have emigrated to developed countries including the U.S., Britain and France (e.g., Gambia/63%, Ghana/46%, Kenya/38% and Angola/33%). Almost 50% of doctors migrate within five years of graduation (Mantey, 2006). “Nigeria alone has 33,000 doctors living in the USA, while the country suffers a healthcare crisis” (Sankore, 2005). Among this brain drain is a critical loss of university faculty to the First World (Schoetzau, 2005).

Many Africans with doctoral and masters degrees are driving taxis in the United States or Europe, since there is no economy to absorb them or because of the low pay relative to the cost of living in their own countries. As the veterinarian graduates from Karen Veterinarian School explained to the principal author in the early 1990s, the majority of the graduating classes over the last three years had had to leave Kenya to find work. In fact,

“at present there are more African scientists and engineers working in the USA than in Africa” (Commission for Africa, 2005).

This has “serious implications for economic growth and development” on the subcontinent and reflects the unstable political and economic environment (Mantey, 2006). While an advisor to USAID in the Caribbean, a U.S. State Department employee, believed to be the CIA operative explained,

“our goal is to identify the best and the brightest in the developing world, send them on scholarship to America and make sure they stay in the United States”.

The planned “Blue Card” of the European Union will also attempt steal the best and brightest to fill skilled labor jobs vacant because of an aging population (see Section 11.4, ECONOMIC DEVELOPMENT AT INDEPENDENCE).

Let's face it, the brain drain from the rest of the World has helped America achieve the status it has today as an economic and military power. Sub-Saharan Africa and the Developing World lose unless economic growth and job opportunities can provide these graduates with economic incentives to remain/return to their country. Otherwise, can one blame them for not coming home?

If the Western donors want to help Sub-Saharan Africa, improving the quality and access to education at all levels must be a priority concurrent with economic growth to allow absorption into the workforce. The new breed of African leaders must make education linked to economic growth priorities and call the shots on how donor money is spent, as opposed to letting expatriate experts, with their biases, determine direction (see Section 11.7.2, Foreign Aid Conditionalities Good Business For Donor Country Not Recipient/Host Country). Care must be given to tailoring education to the need, over-educated individuals often being unwilling to return to rural areas or countries when the level is too elevated (Sachs, 2005).

11.13.2 Health in Sub-Saharan Africa at the Beginning of The New Millennium

All the UN Millennium Development Goals being tracked by the Global Governance Initiative affect health (World Economic Forum, 2004):

- Peace and security—critical to maintaining health services and preventing the violence, hunger, poverty and infections accompanying conflict;
- Poverty;
- Hunger—protein-energy and micronutrient malnutrition reduce resistance to deadly infections and stunt one's ability to learn (see Chapter 5, Section 5.4, HUNGER LINKED TO POVERTY);
- Education—particularly of mothers and girls;
- Environment—water and sanitation, breeding grounds for infectious agents; and
- Human rights—especially of women.

The average life expectancy in Sub-Saharan Africa is 46 (Cobb, 2005) to 47 (Sachs, 2005) years old, compared to Center For Disease Control estimates of 77.6 years in the USA (Medical News Today, 2005). Sachs estimates that 10,000 Africans die/day from poor health care, especially from HIV/AIDS, malaria and tuberculosis. Annual per capita expenditure on health care over much of Africa is very low.

The Commission for Africa (2005) estimates that

“average spending on health per person in Africa in 2001 was between US\$ 13 and US\$ 21; in the developed world it is more than US\$ 2,000 per person per year”.

In the United States, the total health expenditure per capita in (International US\$, 2002) was US\$ 5,274 (WHO, 2006). The Commission for Africa (2005) estimates that to bring appropriate health care, clean water and sanitation to Africa will require an investment by Western Donors of an

“additional \$US 10 billion a year from 2006, rising to \$US 20 billion a year by 2015 as health systems are strengthened”.

Once again, the US\$ 40 billion debt relief of June 2005 by the G-8 will contribute in only a minor way in addressing health and educational needs on the subcontinent. Africa has the highest disease burden in the world (25% versus 75% for the rest of the world) and one of the lowest percentages of health workers in the world (1.3% of world health force). Many doctors and nurses are leaving Africa for attractive, better paying jobs in the West, costing Africa an estimated US\$ 500 million in health care investment. An estimated

“27,000 highly qualified African health workers including doctors emigrated between 1960 and 1975, an average of 1,800 per year. This annual rate had increased to 8,000/year by 1987 and to 20,000/year during the 1990s” (Commission for Africa, 2005).

11.13.2.1 Child mortality as a health indicator

The Commission for Africa (2005) estimates that

“1 in 6 children in Africa dies before reaching their 5th birthday. This is largely because health care delivery systems are at the point of collapse following years of debilitating under-investment” (Also see Chapter 5, Section 5.4, HUNGER LINKED TO POVERTY and Chapter 12, Section 12.6.1, Health and Structural Adjustment).

High infant mortality rates encourage higher fertility rates to compensate for losses, in order to assure adequate members of the family reaching adulthood to take care of their parents in old age. This, in turn, establishes a poverty cycle/trap of under-/malnourished youth with (Sachs, 2005) limited productivity and intellectual capacity.

“The most common health indicator is life expectancy (at birth), largely driven by infant and under-five mortality, since years lost at a very young age have a greater impact on total life expectancy than does extending the life of the elderly. In Sub-Saharan Africa under 5 deaths fell from 253 deaths/1,000 live births in 1960 to 173 in 2001” (World Economic Forum, 2004),

but there is still a long way to go to achieve the target of less than 70/1,000. World-wide, the rate is 80 deaths/1000 live births and the developed region rate is 6/1000 live births (Commission for Africa, 2005).

“On average, life expectancy rises dramatically as per capita GNP reaches \$2,000 and more gradually thereafter...Only in the past century did under-5 mortality in high-income countries fall below 70 deaths per 1,000 live births (Norway, 1930; the United Kingdom and the United States, 1940; Japan, 1950; the Soviet Union, 1980)” (World Economic Forum, 2004).

“In Sub-Saharan Africa the ratio of births attended by skilled health personnel has declined...Significant reduction of maternal deaths at child birth are unlikely to be met” (World Economic Forum, 2004)

unless there are drastic changes in economic development.

11.13.2.2 HIV/AIDS

The prevalence of HIV/AIDS is discussed in Chapter 5 (Section 5.8, HIV/AIDS DECLINING AGRICULTURAL PRODUCTION AND FOOD SECURITY IN SSA) as it will have a major impact on agricultural production in Sub-Saharan Africa.

“Only 1 in 7 of the world’s people live in Africa yet they account for 67% of all people living with HIV and AIDS. And despite efforts to date, prevalence rates are still rising overall. With over 3 million infections just last year, we have yet to see the pandemic peak. Tragic though the effects of the 2004 South Asian Tsunami were, last year’s AIDS death toll in Sub-Saharan Africa was equal to the fatalities of 8 South Asian tsunamis combined (2.3 million). Last year the number of children who died of AIDS in Africa topped 500,000 and the number of AIDS orphans is growing: the projections for 2010 suggest that the numbers will more than double from its 2000 levels to nearly 19 million” (Commission for Africa, 2005).

“AIDS does not just attack an individual. It attacks 3 generations – the person living with HIV and AIDS, the children left behind and the children born with the HIV virus, as well as the grandparents pressed into levels of childcare and food production for which their advancing years ill-fit them (Commission for Africa, 2005)”,

reversing development and ravaging the social fabric. In addition to conflict, HIV/AIDS is beginning to make a major contribution to the numbers of orphans in Sub-Saharan Africa (Commission for Africa, 2005) that place a costly burden on society both economically and socially, especially if they are denied nutritional and moral requirements at an early age, risking to become street urchins in the rural slums and eventually criminals, prostitutes and perpetrators of the HIV/AIDS pandemic. For example, street children in Nairobi, Kenya, have risen from 4,500 to 30,000 in three years (Commission for Africa, 2005).

“In Zambia 71% child prostitutes are orphans, 56% street children are orphans in Lusaka and 78% child domestic workers are orphans in Ethiopia” (Commission for Africa, 2005).

“Access to services for the prevention of mother-to-child transmission of HIV/AIDS was virtually universal in Western Europe, North America and Australia and New Zealand—but 1% in Sub-Saharan Africa, 3–6% in South and Southeast Asia and East Asia and the Pacific and 19% in Latin America and the Caribbean. HIV/AIDS in SSA is a major problem among child bearing women” (World Economic Forum, 2004).

About 6.2 million (62%) of the world’s youth ages 15-24 living with HIV/AIDS (over one billion) are found in Africa. It is estimated that of the youth ages 15-24 with HIV/AIDS in Sub-Saharan Africa, about 76% or 4.7 million are women (Commission for Africa, 2005).

“In Sub-Saharan Africa, for example, only 6% of people have access to HIV counseling and testing, and only 1% of pregnant women have access to treatment to prevent mother-to-child transmission....Only 50,000 of the 29.4 million people with HIV/AIDS in Africa were receiving antiretroviral therapy at the end of 2002” (World Economic Forum, 2004).

Furthermore, “the poorest of the poor are less likely to have adequate housing, nutrition, potable water or sanitation. They also have less access to preventive services (vaccines, micronutrient supplements, insecticide-treated bed nets, malarial prophylaxis and skilled birth attendants) and to treatment (antibiotics, rehydration, anti-malarial and antiretroviral therapy)” (World Economic Forum, 2004).

HIV/AIDS is also affecting the number of qualified teachers.

“In Sub-Saharan Africa, educational achievements are threatened by the HIV/AIDS pandemic, which has claimed the lives of many trained teachers – mainly female teachers in both primary and secondary schools. HIV/AIDS prevention and treatment programs

need to focus on education services to avoid the collapse of already fragile education systems and the reversal of past gains" (ILO, 2004).

Some of the more successful programs involve getting back to traditional values such as Uganda's "ABC" program (Abstinence, Be Faithful, Use A Condom) (Commission for Africa, 2005). In KwaZulu Natal Province, South Africa, with one of the highest rates of HIV/AIDS in Africa, going through traditional Zulu rituals, many young girls are taking vows of virginity until marriage. What this implies is getting back to traditional cultural values, many of which have been lost or degenerated with urbanization and Westernization of African societies, or at least blending traditional values with modern trends. The Commission for Africa (2005) believes that,

"AIDS will not be checked until those combating it take on board cultural factors about poverty and choices, traditions and beliefs, perceptions of life and death, witchcraft and ancestral punishment, power hierarchies and gender norms, social taboos and rites of passage, control of female sexuality and the demand for male virility and pressures for widows to marry close relatives of a husband recently dead from AIDS".

Current Health Initiatives, HIV/AIDS

"The U.S. Congress authorized an Emergency Plan for AIDS Relief, a 5-year, \$15 billion initiative which aims, by 2008, to prevent 7 million new HIV infections, treat 2 million HIV-infected individuals and care for 10 million HIV-infected individuals and AIDS orphans in 14 countries in Sub-Saharan Africa and the Caribbean. Only \$10 billion of these funds are new funds; the other \$5 billion are being diverted from other accounts. Targeted for these resources are 14 countries, 12 in Sub-Saharan Africa and 2 in the Caribbean" (World Economic Forum, 2004).

"Private philanthropic initiatives by foundations and wealthy individuals have also been making a major contribution to global social goals for many years. Estimated international grants by

United States foundations alone reached a yearly average of more than US\$ 3 billion over the 2000–2002 period, of which about two-thirds (67%) went to programs for health, education, international development and the environment” (ILO, 2004).

“The Bill and Melinda Gates Foundation, with assets of \$23 billion, has committed several hundred million dollars to HIV/AIDS prevention, treatment, research and policy programs domestically and internationally. The Henry J. Kaiser Family Foundation has committed \$50 million over five years to ‘Love Life,’ an initiative in South Africa to reduce HIV infection among adolescents by promoting sexual health and healthy futures through the use of high-powered media coordinated with nationwide outreach, support and clinical services. The Rockefeller Foundation has committed \$15 million over five years for medical studies of cost-effective AIDS care in Africa—and another \$15 million over five years to advance research on microbicides, topical gels and ointments that can prevent infection with HIV and other sexually transmitted diseases”. (World Economic Forum, 2004).

“In 2001 Bristol-Myers-Squibb committed \$15 million for a new program called ‘Secure the Future’ to develop ways to prevent and treat HIV/AIDS among women and children and to help communities deal with AIDS. To date, it has allocated 60% of these funds to 130 community projects in five Sub-Saharan African countries. In 2001 an additional \$15 million was committed to projects in four West African countries. GlaxoSmithKline has invested about \$50 million in Positive Action, to help people living with HIV play a more visible role in national HIV policymaking and in fighting stigma and discrimination” (World Economic Forum, 2004).

“Merck launched an initiative in 2000 with the Bill and Melinda Gates Foundation and Botswana to improve the overall status of HIV/AIDS care and treatment there. In June 2001 Pfizer announced a program to provide the resources and infrastructure to provide treatment and clinical training at Makerere University in Uganda through the Academic Alliance. Pfizer also announced that it will offer Diflucan, a drug to combat fungal infections associated with AIDS, free of charge to more than 50 of the poorest and most AIDS-affected nations. Boehringer Ingelheim has promised free nevirapine to any country in Sub-Saharan Africa that desires it for

the prevention of mother-to-child transmission" (World Economic Forum, 2004).

11.13.2.3 Malaria

Sub-Saharan Africa is the region with the highest malaria infection rate in the world.

"At the turn of the 20th century, Africa saw 223 deaths a year from malaria per 100,000 people, only slightly more than other developing regions. By 1970 the rate had fallen to 107 in Africa, compared with only 7 in other regions. But while the decline has continued elsewhere, the death rate has soared again in Africa to 165 per 100,000. Social upheaval and civil wars, a breakdown of health services in many countries, and growing resistance to anti-malarial drugs are to blame" (World Bank, 2000).

Malaria kills at least one million people each year in Sub-Saharan Africa (SSA). According to some estimates, 275 million out of a total of 530 million people in SSA have malaria parasites. Globally, the disease kills more than one million children each year (IDRC, 1996; Schlein, 2004) - 2,800 per day - in Africa alone (IDRC, 1996).

"It is responsible for one in every five deaths in young children in Africa (20%).... more than 75% of the infections and 90% of the deaths from malaria are in Sub-Saharan Africa" (World Economic Forum, 2004).

Each year in Africa, the disease takes the lives of more than 500,000 children below the age of five (Colgan, 2002), and this would be mostly in Sub-Saharan Africa since North Africa's desert climate is not very conducive to the mosquito disease vector.

The use of insecticide treated bed nets has been shown to be a major deterrent to contracting malaria, though it tends to have less than 5% coverage in SSA (World Economic Forum, 2004).

However, a recent survey showed that approximately 15% of young children in SSA slept under a net, but that only about 2% used nets that were treated with insecticide (ITNs) (WHO, 2003). Recent research shows potential for a fungus that can be put on walls and ceilings of homes that kills mosquitoes. Additional research, among others, is needed to determine how long this fungus survives in the hot humid environment where mosquitoes are prevalent (Berman, 2005).

People who become ill with the disease need prompt and effective treatment to prevent the development of severe manifestations and death. Since the 1980s, parasite resistance to chloroquine, the most commonly available anti-malarial drug, has emerged as a major challenge (WHO, 2003). The World Health Organization (WHO) recommends artemisinin-based combination therapy (ACT) (WHO, 2003; Schlein, 2004), derived from wormwood, an ancient Chinese herb (Stokes, 2006), which is highly efficacious and promises to delay the emergence of resistance. WHO recommends that artemisinin be used in combination with one other drug (e.g., often based on quinine) in order to avoid the risk that the malaria parasite will one day resist the drug, as has happened in the past with all previous malaria therapies. Artemisinin Combination Therapies (ACTs) are 95% effective in curing malaria (Stokes, 2006). So far however, its use is constrained by high costs and limited operational experience in Africa. To date, four African countries have adopted ACTs as first-line treatment (WHO, 2003; Schlein, 2004).

“It costs \$2.40 a dose for ACT, compared to the cheaper, but now ineffective Chloroquine, which costs about 10 cents a dose. For the past two years, WHO has been urging countries where there is resistance to conventional treatments to switch to ACT. Since

then, 15 African countries and 14 outside Africa have taken this advice” (Schlein, 2004).

“The impact of malaria on pregnant women and their newborns can be substantially reduced by the recently recommended use of ‘intermittent preventive treatment’ (IPT). This strategy provides at least two treatment doses of an effective antimalarial at routine antenatal clinics to all pregnant women living in areas at risk of endemic falciparum malaria in Africa (irrespective of whether they are actually infected with malaria or not). About two-thirds (67%) of pregnant women in Africa south of the Sahara attend clinics for antenatal care, and incorporating IPT for malaria into their routine care should be straightforward. Now an integral part of the ‘Making Pregnancy Safer’ strategy, IPT has been adopted as policy by six countries to replace chemoprophylaxis; most other countries in the region are reviewing their policies in the light of the new recommendation” (WHO, 2003).

The ‘Global Fund to Fight AIDS, Tuberculosis, and Malaria,’ created in 2002, finances high-quality programs to fight the three diseases worldwide (Schlein, 2004; World Economic Forum, 2004).

“Some 70% of the 14 million people worldwide who have both HIV and tuberculosis (TB) (which are often linked) are in Africa, where the TB epidemic is rising by 4% a year and is now the most common opportunistic infection of people living with HIV” (Commission for Africa, 2005).

Since it was established two years ago, the Fund has given more than \$500 million for malaria programs globally. Half of that amount has gone for malaria drugs. The WHO estimates it will cost about \$1 billion a year to provide 60% of the needy populations with ACT (Schlein, 2004), such as through the WHO conceived “Roll Back Malaria” Plan started in 1998, having the following goals set for 2010 (WHO, 2003).

11.13.2.4 Safe drinking water in Africa as a health indicator

The World Bank (2000) estimates that only 47% of the people in Sub-Saharan Africa have access to clean water and adequate sanitation facilities. Cobb (2005) estimates 82% of urban residents and only 47% of rural residents of Sub-Saharan Africa have access to improved drinking water. The Commission for Africa (2005) estimates that

“More than 300 million people – some 42% of Africa’s population still do not have access to safe water. Around 60% still do not have access to basic sanitation”.

Providing safe drinking water for Africa would make one of the largest contributors to improved health and decreased child mortality from diarrheal diseases in SSA.

11.14 CONCLUSIONS

Foreign aid has been a tool of neo-colonialism to maintain dependency on former colonial powers at independence, as a means of assuring the continued flow of raw products needed to stimulate European economies. This expanded during the Cold War, as Western donors created welfare states as a means of warding off the Eastern Bloc, Sub-Saharan Africa serving as a chessboard in a global game of ideologies. It is big business for Western consulting firms “Beltway Bandits” and NGOs. Little or nothing reaches the poorest of the poor, while political elites, often puppets of the West, are bought off and even maintained in power with these moneys. Living on welfare means that Sub-Saharan African governments have little or no need for the local private sector or to sustainably manage their natural resources, which can therefore be mined by these elite for short-term profit, and/or mined by the rural poor trying to survive on limited open access

resources, getting minimal value on black/parallel markets, while population pressures on these resources increase. It also means that these political and bureaucratic elite have more allegiance to Western donors and NGOs than to their own citizens and are unaccountable to their citizens since they do not depend on them for survival through taxation, as in much of the world. Meanwhile, sweet deals with the international private sector allows the West to use its technologies to extract Sub-Saharan Africa's natural resources, ship them out raw and obtain added value in the home country. This will be discussed in Chapter 13.

Until there is a majority middleclass and growing economies, there will be a tendency to fall back onto the "security blanket", the communal support base (e.g., extended family, village, ethnic group, religious group, region, etc.) helping nourish the clientele who keep the "Big Man" in power and that encourages corruption. Until resource and land tenure are addressed in which individuals and/or groups have legal access to and stand to benefit from the sustainable use of their resources, democracy as currently practiced on the subcontinent, will be a superficial process, a façade, in which nationalized assets will continue to keep a small politburo of elite in wealth and power.

Sub-Saharan Africa has also served as a dumping ground for cheap Western Food Aid, which keeps subsidized non-competitive European and American farm production in business, while undercutting African agricultural production. America and Europe can feed themselves. Sub-Saharan Africa cannot. This dependence on food aid is a disincentive to Sub-Saharan Africa and, as suggested in Chapter 5, there is a need to develop a continental-wide plan of food production. Why worry, as in Zimbabwe, if the World Food Program (WFP) of the United Nations will feed us; but for how much longer, especially as the global grain deficit increases, as well as human populations both in Africa and globally?

Foreign aid has also been extremely destructive to the environment; from subsidized beef in southern Africa as part of the Lomé Convention, to empowering Western NGOs, with little or no training in tropical resource management and Western urban biases, to determine conservation solutions that tie-up natural resources and compress Africans into smaller and smaller non-sustainable areas in the creation of more parks and protected areas; premonitions of the colonial era described in Chapter three.

Most of Sub-Saharan Africa is still closely tied to the natural resource base for survival. Western funded solutions are pushing to convert at least 10% or more of Africa into exclusions zones, “parks and protected areas”, which disenfranchise, alienate and impoverish rural communities. Parks and protected areas as currently managed, most often with foreign aid funding through Western NGOs, turn communities into poachers and guarantee that the natural resources will be uncontrollably mined for short-term gains – survival. Without the cooperation of the greater society, government game and park department bureaucrats will not be able to control access to these areas nor sustainably manage their resources. Foreign aid-driven conservation “talks community” but “acts neo-colonial”. In a number of instances, consideration should be given to taking Western NGOs and donors to the International Criminal Court (ICC) for eco-genocide of entire cultures.

Even if 80% or more of the benefits can go to rural communities from community-owned safari and tourism companies, as well as the sustainable harvesting of game for bushmeat, trees for timber and charcoal, fish and wild medicines, in most cases there are not enough resources or income generated to significantly impact the average head of household in rural areas and that is a fact that the conservation and agricultural communities must own up to. What does this mean?

As currently structured, foreign aid should be eliminated, as 70-90% goes back to the donor country of origin anyway, mainly to consulting firms, “experts” and NGOs, rarely reaching the poorest of the poor. Foreign aid employs expatriates who bank the majority of their income back home, and gives “Learn to Love America Trips” to politicians and bureaucrats, adding little or no value to the continent. Foreign aid is government-to-government and does not create economies. A significant portion could go to provide low interest loans and/or grants for the international private sector to joint venture and transfer technology to the subcontinent, both in the extraction of primary resources and in their transformation on the continent.

Foreign aid might have a positive role to play; in health and education, both in training rural people to better manage “their” natural resources, but also in preparing the majority for a life working in an increasingly urbanized and what must become an industrialized Sub-Saharan Africa, including IT (Information Technology). A healthy society is one that is adequately nourished and relatively free of disease so as to both learn and to be productive in the work place. Education on the African subcontinent must be a priority over the next 25 years in order to produce a middleclass able to compete in a global society and a critical mass of rural Africans who can manage “their” natural systems. In order for Africans to take advantage of First World tertiary education, as in South Africa and elsewhere, a priority must be to assure that educational standards in primary and secondary schools meet international norms, with one twist. In addition to reading, writing and arithmetic, Sub-Saharan Africa’s educational systems need to orient students towards practical life skills; in rural areas how to better manage their soils, forests, range, fish and wildlife, while in urban centers how to fit into a global economy. The sustainable management of Sub-Saharan Africa’s agricultural and natural resources and their transformation is what will drive the

economies of the subcontinent. As Alec Erwin, South African Minister of Trade and Industry, said we'll take your foreign aid if you wish to help us, but we'll use our experts to design appropriate programs and buy our manufactured goods. This must include a transparent and accountable system that plans development with the people and not for the people, along with good governance.

In reality, if Sub-Saharan Africa controlled the harvest and transformation of its resources, the resource richest continent in the world would not be the poorest continent in the world and it would not need foreign aid and all the baggage, which accompanies it.

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Chapter 12

12.0 SUBSIDIES, FREE-TRADE, STRUCTURAL ADJUSTMENT AND DEBT RELIEF IN SUB-SAHARAN AFRICA - IMPACTS ON RESOURCE EXPLOITATION

“By the 1990s, U.S. foreign policy was no longer defined primarily by the military influence of the Cold War but by its ability to mold societies through economic intervention. By influencing the patterns of resource control, legislation and monetary policy within developing countries, whether through the International Monetary Fund (IMF) and World Bank’s imposed structural adjustment (SAP) programs or through free-trade policies implemented by the World Trade Organization (WTO) and the North American Free-Trade Agreement (NAFTA) the U.S. Government has found new ways to keep developing countries safe for its brand of capitalism” (Willsea, 2003).

“To a degree unparalleled in history, outsiders have introduced, even imposed, reforms intended to change the way sovereign governments organize themselves and spend their money. Donor agencies crafted the reforms, financed them and played a big role in their implementation”, (Berg, 2000 *In: Sogge, 2002*), Elliot Berg speaking in the late 1990s on 15 years of development failure.

“The LDCs⁴⁵⁵ (including Sub-Saharan Africa) are trapped in a vicious circle of interlocking handicaps including poverty and illiteracy, civil strife, geographical disadvantages, poor governance and inflexible economies largely dependent on a single commodity. In addition, many are also burdened by high external debt and hard hit by the continuing decline in the price of primary commodities. These problems have been compounded by continuing agricultural protectionism in the industrialized countries. This restricts market access while subsidized imports undermine local agricultural producers” (ILO, 2004).

⁴⁵⁵ Least Developed Countries.

“Japan, Western Europe, and the United States have more to offer the world than restrictive trade barriers and the persistent custom of protecting the domestic farm at all costs. As a lesson from their own history, the First World nations know that an export potential is crucial to developing economies. They could foster greater investment and growth in the Third World by simply living up to their frequently espoused ideals of free-trade.

The citizens of the First World nations should be proud to be able to feed the impoverished Third World, and much of the formerly communist Second World, but they must recognize that this abundance is not due to the competitive strength of the agricultural sector as much as it is due to those businesses, workers, customers, and taxpayers who must shoulder the burden of subsidies and high prices. This represents a tremendous misallocation of resources and lost productivity for both the developed and the undeveloped nations. The poor in all nations, First and Third, suffer as a result.

It is time that the United States, Western Europe and Japan set a better, more consistent model for the Third World to emulate” (Schoolland, 2002).

This chapter will discuss Western subsidies, structural adjustment (SAP) and debt relief and how they impact on Sub-Saharan Africa’s economies, people and natural resources.

12.1 COMMODITY DEPENDENT, AFRICAN GOVERNMENTS FALL IN-DEBT – SPIDER WEB OF THE WORLD BANK AND IMF

“It consists of taking out of a country its export products and selling imported products to the native population which has received money for the exports. It is an elementary circle in which the market, so far as is possible, is in the hands of the mother country, and the colony is condemned to produce raw products without manufacturing them at home” (Dresch, 1950 *In: Dumont, 1966*).

“We think we are the donors because when I produce a kilo of coffee and sell it raw to the West, I get \$US 1 per kilo. When

someone (middleman) takes it to England he gets \$US 10. Not only do I donate money, I donate jobs. Those who roast the coffee get the jobs" (President of Uganda, Yoweri Museveni *In:* Geyer, 2005).

As will be seen below and in Chapter 13 on the private sector, a major goal of Western foreign policy towards Sub-Saharan Africa was/is to continue this flow of raw products off the continent and into the West's industrial complex. In fact, Sub-Saharan Africa is the only region in the world where the ratio of manufactured goods to exports has fallen, condemning it forever to being nothing more than a resource exporter unless drastic measures are taken. Disinvestment is occurring at the precise historical moment when the information technology revolution has transformed the infrastructure of production, management and communication elsewhere in the world. The upshot is that Sub-Saharan Africa's firms and labor are alienated from the workings of the new global economy, while Sub-Saharan Africa's elites are integrated into the global networks of wealth, power, information and communication. (*Castells, 1997 In: Hoogvelt, 2002 In: Zack-Williams, Frost & Thomson, 2002*).

12.1.1 Historical Perspective

"From the 15th into the 19th century, Africa's primary link with the world was through the export of slaves. In the 19th and 20th centuries, export of raw materials became the dominant link. This role as commodity supplier—whether of high-valued ivory, gold, diamonds, and oil or of precariously priced crops such as coffee and cocoa - largely excluded Africa from the more dynamic sectors of manufacturing, financial services, and information technology" (Minter, 2001).

"This condemned developing countries to vassalized producers of raw products, primarily agriculture and mineral, with low buying power to purchase equipment and manufactured products" (Dumont, 1966).

“Apart from in a few cases where the colonial power might actually set up wholly owned manufacturing plants in the colonized area, manufacturing or processing was forbidden. This is, of course, one reason for the extremely low level of development in many LDCs, particularly African countries, most of which only gained their independence in the last fifty years (most beginning around 1960). Since independence, the economic relations between most African countries and their former colonial powers have hardly changed at all. Coming to independence with little or no industry, the only source of foreign income for most was continued export of raw resources and borrowing, with the latter leading to the serious debt situation that cripples so many LDCs today” (Copeland, 2000).

“Today, structural adjustment policies, which continue this trend, are also believed to be a major source of environmental degradation” (Bond, 2002)

as Sub-Saharan Africa’s resources, both renewable and non-renewable, are being mined for short-term gains with little regard to developing the subcontinent or transforming its people.

“Kofi Annan of Ghana, the first United Nations Secretary-General from Sub-Saharan Africa, divides this era (post-colonial) into two ‘waves.’ the first, during the 1960s and 1970s, was characterized by post-colonial enthusiasm and economic advance; the second, running from the 1980s to the early 1990s was ‘too often marked by civil wars, the tyranny of military rule, and economic stagnation.’ Autocratic leaders, whatever their proclaimed political ideology, turned to police state repression and Cold War patrons to stay in power. The worst perpetrated enormous human rights abuses. Even the best failed to deliver on the hopes of independence regarding political liberties, social services, and economic improvement. Thus, much of the economic advance of the 1970s was rolled back in the 1980s and early 1990s as a result both of internal failure and a tougher world economic climate, including the oil crises in the 1970s, a steady fall in world prices for Africa’s leading agricultural exports, and the linking of international assistance to draconian structural adjustment policies (SAPs or ESAPs)”⁴⁵⁶ (Minter, 2001).

⁴⁵⁶ Economic Structural Adjustment Program (ESAP) ≈ Structural Adjustment Program (SAP)

Globalization replaced old dictatorships of national elites with new dictatorships of international finance. Structural adjustment took on a life of its own in the 1980s under the Reagan/Thatcher administrations, where the IMF and the World Bank moved from Keynesian economics, that looked to government policies to help overcome market failures, to “free-market” economics that wanted governments out of the way (Stiglitz, 2002), at least for developing countries. The IMF and World Bank became the “chef and sous chef” and structural adjustment became the “recipe” that was supposed to fix, but ended up “cooking the economies” of the developing world. Structural Adjustment (ESAP or SAP), neoliberalism and the Washington Consensus⁴⁵⁷, which will be discussed below, signify a philosophy that has roots in 19th century *laissez faire* political and economic theory, but which came of age in the 1970s (Bond & Manyanya, 2003).

The World Bank, the International Monetary Fund (IMF) and various Western bilateral aid agencies—including the (U.S.) Agency for International Development (USAID)—played a central role in undermining efforts by the post-independence generation of Sub-Saharan Africans to improve basic social services. Beginning in the early to mid-1980s, the World Bank, the IMF and the U.S. began preconditioning aid and loans to Sub-Saharan African countries on acceptance of structural adjustment policies, which included slashing government spending (Minter, 2001). A major goal was to de-legitimize and shrink public powers over firms and capital controls (Sogge, 2002).

“This generation’s failings were also considerable and painful—repressive, ineffective, and corrupt bureaucracies, military dictatorships, and one-party states; deep indebtedness to international institutions and banks; a stifling of grassroots initiatives, public debate, and other civil liberties. These failings were compounded by an international system that fostered ill-conceived, nonfunctional, and costly development projects, heavy

⁴⁵⁷ Free-market consensus between IMF, the World Bank and the U.S. Treasury about the “right” policies for developing countries (Stiglitz, 2002).

financial borrowing, and Cold War-linked civil wars, which left newly independent countries with little economic cushion or political leeway for policy errors” (Minter, 2001).

The net result of Western interventions in Sub-Saharan Africa has been a form of “economic Apartheid”.

“Global Apartheid, stated briefly, is an international system of minority rule whose attributes include: differential access to basic human rights; wealth and power structured by race and place; structural racism, embedded in global economic processes, political institutions and cultural assumptions; and the international practice of double standards that assume inferior rights to be appropriate for certain ‘others,’ defined by location, origin, race or gender. Global Apartheid thus defined, we believe, is more than a metaphor. The concept captures fundamental characteristics of the current world order missed by such labels as ‘neoliberalism,’ ‘globalization’ or even ‘corporate globalization’ ” (Booker & Minter, 2001).

12.1.2 Today, Raw Products Continue Flowing

Despite two decades of structural adjustment policies, Sub-Saharan Africa owed the West US\$ 219 billion in 1997, compared to US\$ 60.9 billion in 1980 when the debt crisis broke (Hoogvelt, 2002 *In: Zack-Williams, et al.*, 2002). Today, Sub-Saharan Africa’s primary exports remain unprocessed agricultural products and, for a handful of countries, minerals and oil (CIA, 2002).

“Even South Africa’s relatively developed economy is extremely vulnerable to the fluctuating price of gold. Although Ghana, one of the World Bank’s ‘success stories,’ increased its income from nontraditional commodities to 18% of total export earnings by 1996, most export revenue still came from cocoa (32%) and gold (45%). Countries that depend almost exclusively on agricultural exports, such as Rwanda and Burundi, are most vulnerable. Oil producers, such as Nigeria and Angola, may be better off in

comparison, but they endure boom and bust cycles as the world oil price shifts" (Minter, 2001).

Africa has an estimated 30% of the world's minerals. It accounts for about 15% of the world's copper production. However, an abundance of certain resources has not meant any rapid development of the continent, which remains one of the world's poorest regions (Van Wyk, 2000).

Natural resources remain an important source of foreign exchange for states in southern Africa. African exports consist of a much higher share of primary commodities, "raw products", (over 60%) than the average for the rest of the world (less than 25%) (Van Wyk, 2000). Major exports have remained essentially the same since the 1960s, with most of Africa being heavily dependent on one or two primary products; agriculture, minerals or timber accounting for 90% of Africa's foreign exchange (Martin & O'Meara, 1995), with little or no added value from transformation. Africa is heavily dependent on the export of 70% raw products versus 30% transformed products, the opposite of the rest of the developing world,

"although paradoxically its share in world commodity exports has declined in the last two decades. Second, the majority of Africa's non-fuel commodity exports have been subject both to high price volatility and a secular decline in real prices. Third, commodity exports are not generating sufficient savings for investment in diversification and in the development of human and physical infrastructure. The continent has therefore been caught in a downward spiral where such dependence and its attendant ramifications have become a structural feature of many of Africa's economies, and the 'commodity trap' in which these countries are caught has become essentially a 'poverty trap'" (Kousari, 2004).

An economy dependent on the export of primary products

“contributes to Africa’s vulnerability in world markets. Prices tend to flux. Since the 1970s, Africa’s market share for these commodities has declined. Market share losses were 40% for commodities such as copper, timber and coffee, almost 60% for iron ore and 30% for cotton and cocoa. This is reflected in the continent’s declining share of world trade. Africa’s failure to develop and expand alternatives to export products such as manufacturing is also reflected in this. As consumption of natural resources by modern industrial economies remains very high (45 to 85 metric tons per person annually) African states will continue to deliver the goods to earn foreign currency. It currently requires 300 kilograms of natural resources to generate US\$ 100 of income in the world’s most advanced economies” (Van Wyk, 2000).

“From 1980 to 2000, the price of sugar fell by 77%, cocoa by 71%, coffee by 64% and cotton by 47%. Africa’s export prices are nearly four times more volatile than those of developed countries” (Commission for Africa, 2005). This negatively impacted “between 20 and 25 million rural coffee growers in Africa, 10 million workers directly employed in cocoa production and 15 million in the cotton sector” (Commission for Africa, 2005).

While the rest of the world has seen income increase from trade in primary products, Africa as a whole and Sub-Saharan Africa have stagnated, as measured by UNCTAD⁴⁵⁸ in 1980 prices (Kousari, 2004). Declines in raw commodity prices often stem from market surpluses from domestic farm subsidies and support (e.g., cotton, groundnuts, sugar and wheat) in developed countries (Kousari, 2004), while in other cases, structural adjustment has encouraged developing countries, relying on one or two primary products to produce those products (e.g., coffee, cocoa, tea), resulting in an over supply and a concomitant drop in global prices for producers. Advances in production technology in Latin America and Asia, land expansion in Brazil and new producers, such as cocoa

⁴⁵⁸ United Nations Conference on Trade and Development (UNCTAD)

production in Malaysia in the 1970s/80s and tea/coffee in Vietnam in the 1980s/90s, resulted in overproduction of these commodities (Kousari, 2004).

In manufactured exports, Africa recorded an average annual growth rate of 6%, less than half the developing country average in the same period.

“This growth has been concentrated in a handful of African countries. In a ranking developed by UNCTAD of the 225 most dynamic products in world trade in terms of growth in export value, Sub-Saharan Africa produces and exports only two products among the first 50, i.e. undergarments (5th in ranking) and outer garments (50th in ranking) and these are concentrated in Mauritius, Lesotho, Swaziland and Botswana”,

revealing that SSA barely participates in trade in market-dynamic products (Kousari, 2004). China is quickly putting the textile industry of southern Africa out of business (see Chapter 13, Section 13.13.6.2, AGOA).

G-7⁴⁵⁹ countries have 12% of the world's population, but they use over 70% of its resources in cash terms (Booker & Minter, 2001) and appear to do whatever it takes to keep these raw resources rolling in as cheaply as possible to stimulate their economies and support their material-based lifestyles. IMF/World Bank Structural adjustment policies, subsidies, tariffs and other restrictions are the economic tools used by the West to keep the raw products flowing from Sub-Saharan Africa and other developing countries.

⁴⁵⁹ G-7countries include the U.S., Britain, Canada, France, Germany, Italy, Japan, while G-8 countries are G-7 + Russia.

12.2 SUBSIDIES AND FREE-TRADE

“Thus, status quo in world relations is maintained. Rich countries like the U.S. continue to have a financial lever to dictate what good governance means and to pry open markets of developing countries for multinational corporations. Developing countries have no such handle for Northern markets, even in sectors like agriculture and textiles, where they have an advantage but continue to face trade barriers and subsidies. The estimated annual cost of Northern trade barriers to Southern economies is over US\$ 100 billion, much more than what developing countries receive in aid” (Centre for Science and Environment, 2002 *In: Global Issues*, 2002a).

All in all, rich country protectionism is estimated to cost developing countries US\$ 100 billion/year, twice as much as they receive in foreign aid (Guest, 2004). The World Bank (2000) estimates an annual loss of trade since the 1960s of US\$ 70 billion/year to Africa, reflecting a failure to diversify into new, dynamic products, as well as a falling market share for traditional goods.

While the United States, the European Union (EU) and the Cairns Group have allied to emerge as the biggest food exporters, at stake is the very survival of over 1.5 billion small and marginal farmers of developing countries. With food poised to become the weapon of the future, the biggest threat is food sovereignty and economic independence. The U.S. and the EU together, account for 35% of the global trade in food and agriculture (Sharma, 2002). The Cairns Group, comprising 17 food-exporting countries,⁴⁶⁰ accounts for over 33% of the world’s agricultural exports (CAIRNS, 2005), with more than 67% of the food trade in the hands of these three major food-exporting blocks (see Chapter 13, Section 13.7, GLOBALIZATION AND MULTI-NATIONALS – CORPORATE

⁴⁶⁰ The Cairns Group consists of Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, the Philippines, South Africa, Thailand and Uruguay.

CAPITALISM). Trade liberalization has helped American exports double over the past 15 years to US\$ 53.5 billion estimated for the current fiscal year (2002), while the EU has increased its performance from 13.5% to 17% of global food trade, in the same period. The U.S./EU are pushing developing countries to conform with the World Trade Organization (WTO) obligations of phasing out or lifting Quantitative Restrictions (QRs), allowing easy penetration by American and European farm commodities and processed products. Once these countries become dependent on the U.S. and other developed countries for food, the battle for food supremacy, a basic human right, is won (Sharma, 2002). Sachs (2005) tends to agree that trade liberalization benefits will mainly accrue to large food exporters: The United States, Canada, Argentina, Brazil and Australia, but not necessarily greatly to Sub-Saharan African countries.

12.2.1 World Trade Organization (WTO)

The WTO, establishing the rules governing the international trading system, is a successor to the General Agreement on Tariffs and Trade (GATT) and was formerly established in January 1995. The trading system over which the WTO presides is about 50 years old, linked to GATT that was established in 1947. Within the WTO, the Quadrilateral Group of the USA, Canada, the European Commission (EC)⁴⁶¹, Japan, Luxembourg and Sweden dominate the WTO, with many decisions made behind closed doors (Boateng, 2004). In 2001, while 80% of the WTO members were developing countries, 80% of the staff were from developed countries. Of 512.5 posts, 39.5 were vacant or under recruitment, 410 were filled by people from developed countries and 94 from developing countries

⁴⁶¹ The European Union (EU) is a family of democratic European countries, committed to working together for peace and prosperity. There are five EU institutions, each playing a specific role: European Parliament (elected by the peoples of the Member States); Council of the European Union (representing the governments of the Member States); European Commission (EC) (driving force and executive body); Court of Justice (ensuring compliance with the law); Court of Auditors (controlling sound and lawful management of the EU budget) (EU, 2004).

(Jawara & Kwa, 2004a). Developing countries, as in CITES (see Chapter 10, Section 10.3.1, CITES A Western Control Mechanism Over Africa's Natural Resources and Development and Section 10.4.3, U.S. Government Threatens African Countries With Foreign Aid Cuts), are bullied and coerced into threats of withholding technical assistance, financial aid, bilateral and multilateral debt and preferential trade agreements. This forces developing countries into walking a fine line between safeguarding short-term benefits and long-term interests, locking them into political impotence, unfair-trade rules and weak trade performance, leaving many to question if the WTO can serve the developing world (Jawara & Kwa, 2004b).

12.2.2 Subsidies, Don't Do As I Do, Do As I Say

“The relative success of the American economy is a function of the global competitive rules, which suit the most advanced, and which positively disadvantage and impoverish others” (Legum 2002).

Both the USA and Europe subsidize and protect many of their markets. In fact, governments are central to the modern capitalist system (Chomsky, 1999), assuring protection for weak markets, food production, universal rights to good and free, if not inexpensive or subsidized, education (guaranteed free in the USA through secondary school and subsidized at the tertiary level through state universities) and health services for the needy, as well as food relief when necessary. Similarly, Sachs (2005) states that all successful economies are mixed economies relying on a balance between the public and private sector for economic development, with public support for financing education, medical and agricultural research and health care, all of which were denied developing countries under this model (e.g., Structural Adjustment). In fact, public spending in the United States in these areas at the local, state and federal level combined is about 30% of the GDP (Sachs, 2005).

In the United States, in one way or another, everyone is tied to the government and government services. A large segment of society works for federal, state, county or municipal governments. The majority of defense contractors and consulting firms live off of the government dole, as work is “farmed out” to the “private sector”, known around Washington, D.C. as “Beltway Bandits”. In the USA, to assure a minimal standard of living there are various forms of social support from the government including welfare, food stamps, unemployment benefits, Medicare (health care for people over 65 years of age) and Medicaid (health care for low income families). It is a complete illusion that the USA is a free wheeling *laissez faire* capitalist society, with little or no intervention by the state. America is as much a liberal social democracy state as Sweden, France, Britain or Italy. As in these countries, Americans democratically elect their leaders to provide them with this social welfare. Chua (2003) considers this the means by which Western capitalism cushions the harshness of this system to the majority, in essence creating a middleclass that closes a blind eye to the fact that an elite minority control the majority of the wealth. There is nothing wrong with assuring a country’s citizens a guaranteed minimum quality of life and equal opportunities through higher education to advance oneself. However, citizens in developing countries should not be denied the same opportunities through stifling IMF/World Bank policies, trade barriers and subsidies.

Meanwhile, in the developing world, and in particular Sub-Saharan Africa, the majority of citizens get by with no insurance of any kind; no unemployment insurance, no health insurance and no retirement insurance; this safety net seen by Western society as an essential element for a healthy economy. The protection that does exist is supplied by the family and community instead of the government (Stiglitz, 2002). Yet people ask why Africans have such large families and what the importance of the extended family/communal network is. Well this is one major reason - a safety net for the majority, especially in times of

sickness, drought or old age, necessary in SSA's declining and/or stagnating economies that are endemic to the subcontinent.

President Truman's Air Force Secretary put the matter simply: we would not use the word "subsidy", he said, we would use the word "security". He made sure the military budget would "meet the requirements of the aircraft industry". What this helped spawn was a civilian aircraft industry, now the country's leading export, and the huge travel and tourism industry, which is aircraft-based. In fact, today the world's production of aircraft is virtually a monopoly of large-scale subsidized industries, Boeing-McDonald (USA) and Airbus (France/England joint venture). The same pattern prevails in computers and electronics, automation, biotechnology, communications, in fact in just about every dynamic sector of society. Under the Reagan Administration, more relief was granted to U.S. industry than by any of his predecessors in more than half a century, presiding over the greatest swing in protectionism since the 1930s. Virtually all the world's largest core "Transnational Corporations (TNCs) or multi-nationals) are heavily subsidized and/or protected by trade barriers (e.g., tariffs and quotas) and at least 20 companies in the 1993 Fortune 100 would not have survived at all as independent companies if not saved by their respective governments. Lockheed, a U.S. - based aerospace industry, was saved from collapse by government loans. Bailouts have been seen in the aerospace, electronics, modern agriculture, materials technology, energy and transportation technology (Chomsky, 1999). So much for "free-market" systems and policies in the West. Recently, both America and Japan announced new programs for the funding of advanced technology in aircraft and semi-conductors to sustain the private sector through public subsidies.

If one looks under the rug, government subsidies can be found in much of the "private sector" research in everything from genetically modified crops to stem cells. In America, there is a large gray area over what is private versus public

sector. Farmers are subsidized to assure that America always has food, and uncompetitive industries, such as sugar and steel, are protected.

12.2.3 Free-markets?

Most of the “advanced industrial countries” (e.g., G-7) built their economies by selectively protecting some of their industries until they were strong enough to compete with foreign companies. Meanwhile, poor developing countries have been pushed to eliminate their trade barriers (Stiglitz, 2002).

By 2000, the USA had lifted only 13 of 750 restrictions to “free-trade” acknowledged in the Uruguay round of the General Agreement on Tariffs and Trade (GATT); the EU 14 of 219 and Canada 29 of 295 (Legum, 2002).

In 2003, after a challenge in the World Trade Organization (WTO) by the European Union (EU), together with Japan, Korea, China, Switzerland, Norway, New-Zealand and Brazil, the EU threatened the USA with US\$ 2.2 billion in sanctions on products from the USA plus legal proceedings through the WTO (Cox, 2003 & Lamy, 2003). Beginning with 100% tariffs on many U.S. steel products, the list moves on to include clothing, industrial machinery, farm produce, paper and even brooms, pens and juice (Santamaria, 2003), as well as citrus, fruit, rice and steel (Cox, 2003). Of the 1,866 items on the list, the majority are common consumer products. Meanwhile, on December 4, 2003, the U.S. announced the full and immediate termination of its steel safeguards that placed tariffs as high as 30% on imported steel products (Lamy, 2003).

“Thus Free-trade is not good for everyone and African countries face huge barriers in establishing an agro-export economy to trade their way out of poverty because of tariff barriers and produce dumping by European and U.S. producers. Trade rounds ostensibly benefit the whole world by enhancing competitiveness, expanding the marketplace to increase trade volume; enhancing the value of the goods we trade. These assumptions are based on fundamentally flawed principles. Trade has the potential to contribute to food security, but in practice two sets of rules have been enforced: one for those allowed to and responsible for distorting the market through tariff and non-tariff barriers, and those – the developing countries – who were not and are now legally prohibited from doing so” (Roman, 2003).

In fact, as will be seen, free-market, neo-liberal, Washington Consensus structural adjustment principles imposed on the Developing World are a hypocritical “don’t do as I do, but do as I say”, approach to economics. The sad thing is that so many developing country leaders have fallen for this model, long abandoned or never used by the West except against other countries where government steps aside and leaves everything up to the private sector, where profit is the bottom line, not people and their welfare. For instance, subsidies, quotas and protective tariffs are a “no no” in free-trade theory, which is applied to the Developing World across the board, but only when it suits the West in spite of the West-controlled World Trade Organization (WTO) that is supposed to assure that all parties abide by “free-trade” principles. However, in reality, the WTO appears to be a tool for “exporting American values”, especially deregulation, allowing foreign investors to invest without restriction in central areas of the host country’s economy. This impacts about 70 countries, which are signatories (Chomsky, 1999). Commercial interests dominate the WTO, putting trade above everything else, including the environment and the poor. Meanwhile, while “free-trade” is imposed on the developing world, the U.S. government seems capable of violating trade agreements at will, the United States ignoring WTO rulings,

behaving with others multilaterally where it can and unilaterally as it must (Chomsky 1999).

12.2.4 Agricultural Tariffs and Subsidies

As discussed in Chapter 11, Section 11.8, FOOD AID, excess subsidized food is often dumped on the developing world for a variety of reasons.

While African governments are not allowed to subsidize agriculture based on structural adjustment policies, the EU and America do the opposite (Palmer & Kline, 2003 & Roman, 2003). Developing countries have been forced to “discipline” their subsidy norms as per the WTO’s Agreement on Agriculture, allowing for a maximum limit of 10% of subsidy support under the Aggregate Measure of Support (AMS) clause. The majority of the developing countries have eliminated farm subsidies and dismantled agricultural extension systems, South Africa being a prime example. Food supremacy is being handed over to a few food-exporting countries, while developing countries are emerging as food dumps. The world is being told that “precision” farming, a term applied for high-tech agriculture, is the only environmentally sound method of farming. The entire focus is to force the developing countries to sacrifice food self-sufficiency at the altar of world trade (Mittal, 2001; Shah, 2001 & Sharma, 2002).

“It also seems a tad hypocritical of us to complain about governance in third-world countries when we allow tiny groups of farmers to hijack billions of dollars out of our taxes” (Kristof, 2002).

12.2.4.1 Agricultural tariffs

The average import duties on farm products to the EU and America are 40-50% (Legum, 2002). According to the Commission for Africa (2005)

“Average applied tariffs in agriculture in the EU are 22%, and in the U.S. 14%, some 3-4 times higher than in manufactured goods. There is also substantial use of ‘tariff peaks’, or very high duties on specific products. These affect over 40% of agriculture tariff lines in the EU and Japan”.

As an example, tariffs on peanuts coming into the U.S. are 132% (Commission for Africa, 2005). The EU, paradoxically one of the leading proponents of trade liberalization, has one of the most protected agricultural sectors in the world through its Common Agricultural Policy (CAP) (Sharma, 2002). For instance, canned fruit going to the EU from South Africa has a tariff of 15-30%, while tariffs as high as 30% are placed on apricots and other fruits going to the U.S., weakening a fruit industry valued at Rand 1.5 billion that is employing 27,000 people in South Africa (Moneyweb, 2005). September 2003 WTO discussions in Cancun, Mexico, collapsed over differences between the West and the developing world concerning agricultural subsidies and protected uncompetitive markets, especially by America and Europe, and at the beginning of 2008 show little or no progress.

12.2.4.2 Agricultural subsidies

Annual subsidies amounting to US\$ 300 billion to the Organization for Economic Cooperation and Development (OECD) agriculture are equal to Sub-Saharan Africa’s GDP (World Bank, 2000). The United Nations Economic Commission for Africa (ECA) (2003) and Hassett and Shapiro (2003) estimated in 2001, that developed countries paid their farmers subsidies amounting to US\$ 311 billion, as

much as Sub-Saharan Africa's entire economic output (Hassett & Shapiro, 2003). Similarly, it is estimated that the total value of agricultural subsidies in developed countries (OECD) is almost US\$ 1 billion/day. Annually, this is more than the GDP of Sub-Saharan Africa (Legum, 2002; Sharma, 2002; Guest, 2004; Commission for Africa, 2005) which was US\$ 303.5 billion in 2002 (UNDP, 2004) and US\$ 279 billion/year by 2005/6 – over three times the value of global aid to developing countries (Offenheiser, 2006). As subsidies continue to rise, the Commission for Africa (2005) estimates agricultural subsidies in developed countries amounted to US\$ 350 billion in 2003.

"Of this, US\$ 257 billion was support to producers and US\$ 52 billion was support to R&D,⁴⁶² training, marketing and promotion. Most support to producers is provided through market barriers that keep prices artificially high – some US\$ 160 billion – as opposed to the US\$ 97 billion paid directly to producers. The EU, U.S., and Japan account for 90% of total OECD support, and the bulk of this support is for milk, meats, grains and sugar. This support is 16 times OECD aid to Africa (US\$ 22 billion in 2002)" (Commission for Africa, 2005).

UNDP (2004) estimates Official Development Assistance (ODA) to Sub-Saharan Africa was US\$ 17.2 billion in 2002 (see Chapter 11, Table 11.4, Official 2002 development assistance (ODA = foreign aid) as a percentage of all investment inflows to Sub-Saharan).

The OECD has a method of measuring market protection in a given member state called "Producer Subsidy Equivalent/Producer Support Estimate (PSE)". PSE is

"a broadly defined Aggregate Measure of Support (AMS) to agriculture that combines into one total value aggregate, direct payments to producers financed by budgetary outlays (such as

⁴⁶² Research and Development.

deficiency payments), budgetary outlays for certain other programs assumed to provide benefits to agriculture (such as research and inspection and environmental programs), and the estimated value of revenue transfers from consumers to producers as a result of policies that distort market prices" (USDA, 2003) or "the monetary value of transfers (direct and indirect) from consumers and taxpayers to producers" (OECD, 2005).

Expressed as a percentage, the %PSE provides an indication of how much of a farmer's earnings are from government support/interference, this percentage being paid either directly or indirectly by government and/or by increased costs to the consumer (e.g., in a protected market).

"The %PSE, accounted for 32% of farm receipts, a slight increase from 2002, but down from 37% in 1986-88. The PSE in 2003 is estimated at \$US 257 billion, or EUR 229 billion...Support to producers in 2001-03 was below 5% of farm receipts in Australia and New Zealand, 20% or less in Canada, Mexico, Poland, Slovakia, Turkey and the United States, around 25% in the Czech Republic and Hungary, 35% in the European Union (EU), and 60% or more in Iceland, Japan, Korea, Norway and Switzerland" (OECD, 2004).

Similarly, "The EU is the largest protector of agriculture in the world. The EU also accounts for 90% of OECD export subsidies in agriculture. Gross support from consumers and taxpayers to farmers constitutes only 2% of farm receipts in New Zealand, but around 20% in the U.S. and Canada, 35% in the EU, and 58% in Japan. Japan spends 1.4% of GDP on agricultural support, the EU 1.3%, and the US 0.9%" (Commission for Africa, 2005),

these costs being passed on to the consumer through higher food costs and taxes. Percent PSE for key commodities in 2003 for the OECD as a whole include: wheat/37%, maize/21%, rice/74%, sugar/56%, milk/49%, beef and veal/35%, sheep/42% and all commodities/32% (OECD, 2004).

In 2004, the Total Support Estimate (TSE), an OECD indicator of the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures to agriculture in OECD countries, amounted to about US\$ 378 billion (EURO 305 billion), the United States accounting for about US\$ 109 billion (29%), the European Union (EU) for about US\$ 151 billion (40%), and Japan for a little less than US\$ 61 billion (16%). Of the US\$ 378 billion, about US\$ 280 billion was paid by OECD countries in support (Producer Support Estimate) to farmers (leaving out general services [about US\$ 65.8 billion] and consumer subsidies [about US\$ 32.6 billion]), the U.S. transferring US\$ 46.5 billion, the EU - US\$ 133.4 billion and Japan - US\$ 48.7 billion. These three were responsible for 85% of the TSE and 82% of the PSE in OECD countries. The level of producer support in the OECD as a whole, as measured by the %PSE, is estimated at 30% in 2004, the same level as in 2003 (OECD, 2005).

In general, subsidies, tariffs and quotas increase costs to OECD consumers, keep prices artificially elevated and result in flooding of world markets dropping global commodity prices. While the OECD is supposed to be helping Sub-Saharan Africa develop economically and improve its agricultural production through foreign aid and technical assistance, it is simultaneously creating commodity shocks through its policies (Commission for Africa, 2005).

Subsidies lower global prices by encouraging over-production, some of which, in the case of food, is dumped on poor developing countries (see Chapter 11, Section 11.8, FOOD AID). “These subsidies are crippling Africa's chance to export its way out of poverty,” said James Wolfensohn, the World Bank president (Kristof, 2002). These issues have to be addressed in the World Trade Organization (WTO). There is increasing concern that subsidies should be removed in developed countries (UNECA, 2003).

In July 2004, there appears to have been a breakthrough in WTO negotiations to reopen free-trade talks known as the DOHA⁴⁶³ development round, which would eliminate export subsidies and reduce domestic subsidies, improving agricultural trade. The U.S. will “fast track” cotton subsidies (Schlein, 2004). According to Bello and Kwa (2004), the African cotton producing countries failed to get the U.S. cotton subsidies fast tracked or a commitment to have them eliminated. According to SouthAfrica.info (2004), the July, 2004 WTO agreement will result in the West opening its markets to African agricultural products in return for Africa cutting duties on industrial goods.

“The EU, the United States and countries such as Japan and Switzerland set greater access to markets for industrial goods in developing countries as the price for farm subsidy cuts” (Waddington & Lannin, 2004).

Are we not back to square one; Africa continuing to export raw products and import transformed ones? It also appears that the reduction in export subsidies would not be before 2015-2017 (Global South, 2004). A specific end-date to export subsidies will only be achieved in the next round of negotiations (Bello & Kwa, 2004). In early 2008, these issues have still not been resolved.

⁴⁶³ Doha, Qatar where periodic WTO ministerial conferences have taken place.

Hiding Domestic Trade and Production Subsidies, Green, Blue and Amber Boxes

There are many games being played with domestic trade and production subsidies under the following categories:

- **Green Box** (no, or minimally trade distorting support).
- **Blue Box** (domestic support linked to limits on production and exempted from spending limit).
- **Amber Box** (all government spending in this box, unless it qualifies for Blue or Green Box) - trade distorting support. This includes market price support, direct payments and input subsidies.

The 'Green Box' covers subsidies that are expected to cause minimal or no trade distortions. Such subsidies have to be publicly funded but must not involve price support. In simple words, it includes direct income support to European, American and Japanese farmers, which is formally decoupled from production levels and prices. 'Green Box' also includes subsidies granted in the name of environment protection and preservation, and for agricultural research and development. In reality, these subsidies are termed 'non-trade distorting' because of the ability of only the rich countries to provide for such support. Knowing that the developing countries do not have the financial resources to pose any threat to the protection provided through 'Green Box' (Sharma, 2004a).

There is concern that developed countries will cut subsidies in some areas and then move them into the "Green Box".

“Developing countries need to worry about the ‘Green Box’ subsidies because it actually operates like ‘income insurance’ scheme for the farmers in the industrialized countries. They remain insulated from the volatility of the global markets. Whether the international prices slump or go on a meteoritic rise, they remain unruffled, as their life style has already been protected by the state subsidies” (Sharma, 2004a).

Even when direct export subsidies are eliminated, indirect export subsidies can be provided under the “Green Box”. The “Green Box” houses up to 70% of the U.S. subsidies and remains untouched. Some maintain that after the dust settles, the EU and USA subsidies will remain the same and/or increase (Bello & Kwa, 2004). Sharma (2004a) recommends that the G-20 nations (basically many of the developing countries, led by Brazil and India) push to have all “Green Box” subsidies eliminated.

With regards to the Blue Box, The United States and the EU proposed that the definition be amended to include direct payments based on fixed areas and yields, and in reference to past production (BNA, 2004 & USDA, 2003), a fixed number of head of livestock, or if they are made on 85% or less base level of production (USDA, 2003). At the July, 2004 WTO talks in Geneva, the U.S. scored the biggest gain in an expanded “Blue Box” in which to house a considerable portion of the subsidies to its farmers legislated under the U.S. Farm Bill of 2002 (Bello & Kwa, 2004). Sharma (2004b) suggests that developed counties will now hide Green and Amber Box subsidies under the Blue Box – smoke and mirrors. In the

“case of cotton, an enlarged Blue Box could help to maintain huge levels of U.S. subsidies, contradicting the verdict of the recent WTO panel, which called for the elimination of most U.S. domestic support for cotton because of its damaging effects on other WTO members” (OXFAM, 2004a).

South Africa may be one of the few African countries supporting its farmers. The %PSE in 1998 was only 4.18 and this is a major decline from the %PSE of 12.5 in 1995, indicating a continuous decline in government and market support to agriculture. However, certain agricultural commodities were highly subsidized; wheat with a %PSE of 19.44, sugar/39.55, mutton/49.28, wool/14.97, dairy/20.92, beef and veal/21.20 for the year 1998. Many of the %PSEs for South Africa are very negative. “Negative PSEs imply that low world prices (as a result of distortive policies of OECD countries) indirectly tax South African producers” (Kirsten, Gouse, Tregurtha, Vink & Tswai, 2000).

Special Safeguard Measures (SSG)

Many developed countries also take advantage of protecting sensitive products under a special category of Special Safeguard Measures (SSG). Crucial commodities can be declared as sensitive and thereby be denied market access, a form of quota setting. For instance, the United States, the EU, Japan and Canada maintain tariff peaks of 350 to 900% on food products such as sugar, rice, dairy products, meat, fruits, vegetables and fish. Canada reserves the right to use SSG for 150 tariff lines, the EU for 539 tariff lines, Japan for 121 tariff lines, the United States for 189 tariff lines and Switzerland for 961 (Sharma, 2004b). Bello and Kwa (2004) and Sharma (2004b) estimate that the developed countries will use the category of “sensitive products” to protect some 20-40% of their products from significant tariff cuts.

Sharma (2004b) explains why the apparent proposition over these protective measures was agreed on by the G-20. Just before the WTO meeting, the United States announced on July 23rd, 2004, a sugar quota for 40 countries to export a fixed amount to the USA, including amongst the biggest quotas: Dominican Republic (185,335 metric tons), followed by Brazil (152,691 metric tons),

Philippines (142,160), Australia (87,402), Guatemala (50,546) and Argentina (45,281). The EU withdrew the equivalent of US\$ 60.2 million in foreign aid to Kenya on July 21st under the auspices of bad governance, just before the WTO meeting. Sharma (2004b) implies that many countries were, in essence, bought off. Kenya was the most vocal of countries that staged the walkout at the September 2003 WTO meeting in Cancun. “The terror of trade does not operate on ethics or morality” (Sharma, 2004b). London acknowledged it was using its influence to persuade developing countries (Sharma, 2004b).

“Despite the World Bank repeatedly painting a rosy picture of the gains that would result from the implementation of the WTO trade agenda, the fact remains surging food imports have hit farm incomes and had severe employment effects in many developing countries. Unable to compete with cheap food imports, and in the absence of any adequate protection measures...” (Sharma, 2004b). As Sharma (2004b) puts it, “any move to significantly cut agricultural subsidies will be political suicide for rich countries”.

Since the July 2004 WTO agreement, even in relatively developed South Africa in mid-2004, sophisticated commercial wheat farmers are suffering from wheat that can be imported cheaper from the USA than they can produce in-country. Likewise, South African farmers and agro-industries are suffering from food aid (see Chapter 11, Section 11.8.8, Food Aid and Impacts on Grain Production in Southern Africa), which is, in reality, another way of food dumping from the West linked to agricultural subsidies.

The reality of how much the West will concede with regard to its protected markets will come out between August 2004 and December 2005 at the next ministerial meeting in Hong Kong (Schlein, 2004). UNECA (2004) states that

“not only do the OECD countries seem reluctant to reduce the export subsidies for their own agricultural products, but the dismantling of domestic farm support measures (e.g., the EU’s

Common Agricultural Policy (CAP), U.S. cotton subsidies) is also currently politically untenable for most of the northern countries”.

This is still the case in early 2008.

America's Agricultural Subsidies

Rosenblum & Williamson (1987) estimated that U.S. farm subsidies were US\$ 25 billion/year in the mid-1980s, while foreign aid to Africa was US\$ 600 million, with twice this amount (US\$ 1.2 billion) going to Israel and Egypt (see Chapter 11, Section 11.7.1.1, Overseas Development Assistance (ODA) versus Overseas Assistance (OA), U.S. Foreign Assistance). The Commission for Africa (2005) estimates that

“the U.S. Farm Bill in 2002 institutionalized emergency support to U.S. farmers – with a 10-year value of \$US 190 billion, an increase of \$US 83 billion over previous programs. There are also stronger links between subsidies and production decisions. This approach leads to oversupply and dumping of agricultural produce; U.S. policy on cotton is one extreme example of the harm this can cause to poor people in Africa”.

Between 1994 and 2004, subsidies to U.S. farmers totaled US\$ 140 billion, US\$ 20 billion in 2005, 93% for corn, cotton, wheat, rice and soybean (Redline & Kline, 2007). Export credits, a form of welfare, under the 2002 U.S. Farm Bill amount to US\$ 5.5 billion that according to WTO agreements, should be eliminated (Commission for Africa, 2005), but as discussed above, will likely be hidden.

The massive increase in agricultural production, especially in the American West over the last century, is due to massive government subsidies (see Chapter 7, Section 7.1, BIG DAM ERA IN THE WESTERN UNITED STATES).

“The disaster Powell⁴⁶⁴ predicted – a catastrophic return to a cycle of drought – did indeed occur, not once but twice: in the late 1800s and again in the 1930s. When that happened, Powell’s ideas – at least his insistence that a federal irrigation program was the only salvation of the arid West – were embraced....The result was a half-century rampage of dam-building and irrigation...But even as the myth of the welcoming, bountiful West was shattered, the myth of the independent yeoman farmer remained intact. With huge dams built at public expense, and irrigation canals, and the water sold for a quarter of a cent per ton – a price which guaranteed that little of the public’s investment would ever be paid back – the West’s yeoman farmer became the embodiment of the welfare state though he was the last to recognize it” (Reisner, 1986).

In America, subsidies on cotton, sugar, dairy products and corn exacerbate Africa’s problems (Hassett & Shapiro, 2003),

“Dollar for dollar, America exports more meat than steel, more corn than cosmetics, more wheat than coal, more bakery products than motorboats, and more fruits and vegetables than household appliances. Agriculture is one of the few sectors of the U.S. economy that consistently contributes a surplus to its trade balance. U.S. projections for the current year (2002) are that 53% of its wheat crop, 47% of cotton, 42% of rice, 35% of soybeans, and 21% of corn will be exported. This has only been made possible by the heavy subsidies and the removal of trade barriers or Quantitative Restrictions (QRs) in the developing countries”.

In 2002, the White House and Congress are trumpeting their determination to bring economic opportunity to the people of Africa. The Bush administration has been busy extending special trade status to African exporters. There has even been talk of a “Marshall Plan” for Africa. However, all of those initiatives added together may not be enough to offset the damage inflicted on Africa’s small farmers by the \$190-billion (over ten years) agriculture bill that President Bush signed into law. This will put millions of small farmers out of business in Africa,

⁴⁶⁴ John Wesley Powell, famous for being the first to run the mighty Colorado River.

said Mark Ritchie, president of the Institute for Agriculture and Trade Policy in Minneapolis (Vieth, 2002).

“ ‘Commodity prices will probably sink lower on a global basis. For countries that do not subsidize their farmers as well as we do, that will mean economic and financial trauma,’ said Neil Harl, director of the Center for International Agricultural Finance at Iowa State University. ‘We’re making decisions here in the U.S. that affect the entire world, yet the rest of the world doesn’t have much say in what our policy is’ ” (Vieth, 2002).

The adoption of the U.S. “Farm Security and Rural Investment Act, 2002” is a case in point. A recent review indicated that the Bill (NEPAD, 2002):

- “offers support to a declared maximum of \$US 360 000;⁴⁶⁵
- raises spending on U.S. farm subsidies by some 70% (\$US 15-20 billion/year). This is already more than Africa’s total annual agricultural exports;
- offers fixed payments each year for each eligible crop (including a number of crops currently or potentially important to Africa: cotton, rice, peanuts, other oil seeds, maize, sugar, soybean, sorghum);
- lowers loan rates and in case of low market prices, could offer direct subsidies;
- gives counter-cyclical payments when farm income falls below threshold levels (payments to offset a drop in previous prices);
- dairy farmers can receive 45% (up to a cap) of the difference from a target price specified in the bill;
- sugar continues to be heavily protected against imports;
- new supports are offered for wool, mohair, honey, chick peas and lentils;
- apples, fruit and vegetables are subsidized and their purchase and distribution is also supported”.

⁴⁶⁵ It is believed this is per farmer over a six year period based on the U.S. Farm Bill 2002 (Mitra, 2002).

Money from the agricultural bill will finance a variety of farm programs, from agricultural research to conservation programs. However, much of it, an estimated \$57 billion, will be paid directly to farmers to make up for low commodity prices. The biggest subsidies are earmarked for producers of wheat, corn, sorghum, barley, oats, rice and cotton. According to the Paris-based Organization for Economic Cooperation and Development (OECD), which monitors fiscal policies in industrialized countries, farm subsidies already are distorting the economics of agriculture in the United States. Of every US\$ 1 in U.S. farm revenue, about 25 cents comes from the government. In 2000, government support averaged \$20,800 per farmer (Vieth, 2002).

“Some of those crops are among the major agricultural products of Sub-Saharan Africa--where farm production accounts for an average of 17% of the total economic activity in 48 nations. The farm bill's negative impact on the developing world will eclipse the potential benefits of Bush's proposed Millennium Challenge Account, which would provide poor countries with \$10 billion in additional development aid over three years” (Vieth, 2002).

Impacts of U.S. Subsidies and Globalization on South African Maize Production.

For instance, the international maize market, especially the U.S. market, has a dominant influence on maize prices (Nieuwoudt & Groenewald, 2003), international soybean and grain prices being highly influenced by the Chicago Board of Trade (Areddy, 2005). This forces South African maize farmers to compete on a global market against highly subsidized American farmers. It then becomes cheaper to ship maize in from the U.S. than to grow it in South Africa under “free-market” conditions. Many are concerned that if trends continue, the decreased profitability of maize farming could put many farmers out of business and/or force them to switch to more valuable crops, jeopardizing South Africa’s ability to feed itself and much of southern Africa. Given the loss of southern

Africa's other breadbasket, Zimbabwe, this threat must be taken seriously. An estimated 9,000 commercial maize farmers employ 150,000 farm workers plus a vigorous secondary industry producing staple food for millions of households (NAMM, 2005) or about 18% of the 814,000 people employed in the agriculture/hunting/forestry/fishing sector out of an estimated South African national workforce of 9.1 million based on a 1996 census (Nieuwoudt & Groenewald, 2003).

"The maize value chain is the core business of many input suppliers (e.g. fertilizer, chemical, seed, fuel, machinery and logistic companies), service providing companies (e.g. agribusinesses, marketing and storage companies) and financial institutions (e.g. the Land and other commercial Banks)" (NAMM, 2005).

In the past year, white maize prices in South African declined by nearly 47%, at their lowest levels since August 2000. The drastic decline in domestic maize prices can be mainly attributed to (NAMM, 2005):

- A sharp decline in international maize prices. A record subsidized maize crop in the U.S. caused international maize prices to decrease from US\$ 134/ton in April 2004 to US\$ 96/ton in April 2005, a 28% decline;
- The appreciation of the Rand/USA Dollar exchange rate. The Rand strengthens from R6.76 per USA Dollar in February 2004 to R6.01 per USA Dollar in February 2005, an appreciation of 11%, which caused the producers to loose a lot of money, since the prices are dollar-based;
- An increased cost of farm inputs, since the prices of crude oil and natural gases caused international prices of fuel and chemicals to rocket (e.g., fuel, fertilizer, etc.); and
- An over supply of maize on the domestic maize market, with human demand declining over time due to HIV/AIDs.

“The situation of increasing input prices and historical low maize producer prices have started to raise question regarding the profitability of maize production since the situation affects producers’ ability to repay their loans. The value of farmland is also closely related to the value of the product. In the case of maize production the value of farmland follows the maize price. Lower farmland value severely affects the solvability of maize producers, which affect the security value of the farmers at financiers and could lead to lower facilities at financial institutions. Emerging maize producers do not have the benefit of economics of scale in the domestic maize market as commercial producers have, which make them more financial vulnerable, given the current situation of maize producers. Most emergent farmers are entirely dependent on outside financing, making their current financial position worst. The current low maize prices and low profitability of the maize producers will make it nearly impossible for financiers to finance emerging farmers. This will hamper the transformation in the maize industry” (NAMM, 2005).

Europe's Agricultural Subsidies

Subsidies amount to about US\$ 17,000/year for each EU farmer (Legum, 2002).

Pascal Lamy, the French E.U. Trade Commissioner, explained (Legum, 2002), “ ‘The EU has taken a deliberate decision to keep its farmers on the land, whether or not they are internationally competitive...If we are fully competitive, employment in the farm sector will drop from 7 million farmers to just one million. This is politically unacceptable.’ ”

As in the United States, according to IFPRI (2003), the biggest 25% of EU subsidy recipients receive more than 60% of all subsidies. The question is whether market rules should apply to everything. Important to EU decision-makers is rural life, landscape and environment. These justify the continuation of its costly and inefficient farming strategy (Roman, 2003).

Africa is particularly vulnerable to EU farm subsidies because proximity and decades of colonial and post-colonial relations make Europe and Africa efficient trading partners. As the result of the Common Agricultural Policy (CAP), while the average person in Sub-Saharan Africa earns less than US\$ 1/day, a European Cow earns US\$ 2/day as a result of subsidies (OXFAM, 2002b; Hassett & Shapiro, 2003 & Commission for Africa, 2005). A growing volume of literature argues that the largest factors stunting African economic development include not only disease, drought, warfare and mismanagement, but also the European Union (EU)'s Common Agricultural Policy (CAP). These subsidies reward European farms to produce more, while dumping this excess in the Third World, depressing world food prices, while putting protective tariffs on food exported from Africa (OXFAM, 2002b; Hassett & Shapiro, 2003). Tariff peaks still persist in several products (e.g., sugar, meat and horticultural products) and tariff escalation (higher tariff on more processed products which are given greater protection to the processing industry of the importing country) still prevails in several important product chains (e.g. coffee, cocoa, oilseeds, vegetable, fruit and nuts, and hides and skins) (NEPAD, 2002).

Currently, the CAP consumes 40 billion Euros annually, about half of the EU budget. The CAP sets price guarantees far higher than world prices or production costs. To assure that they are not under-cut abroad, European farmers, like U.S. farmers, receive hefty export subsidies to add to their domestic profits. Politicians seeking election then call on their “partners” for financial support. Thus, large agribusinesses thrive on government largess at the expense of the world’s most vulnerable people. This injustice is maintained because politicians receive their share of the profits (OXFAM, 2002b; Hassett & Shapiro, 2003).

Population density, weather and the cost of capital and labor make the EU an inefficient dairy producer, cost of production being on average twice as high as

international prices. Yet Europe accounts for 40% of the world's exports of whole milk powder and 33% of world cheese exports. Europeans may think that these subsidies go to quaint dairy farms dotting the French and Dutch countryside, but in reality, most of these subsidies go to multi-national agribusinesses such as Aria Foods and Nestlé (Hassett & Shapiro, 2003).

EU subsidies for sugar have an even worse impact on the tropics, including Africa. Sugar cane farmers in the tropics can produce more than twice as much as rivals in cooler climates growing sugar beets. In addition, land prices, wages and other production factors in tropical countries are a small fraction of what they are in the European countries. Yet the EU, with the world's highest sugar production costs, is the world's largest sugar exporter. EU farmers receive guaranteed prices for sugar even if it sells overseas at a lesser price, while in Europe sugar is sold at high prices. CAP tariffs of 140% keep foreign sugar off the EU market. Single large firms account for the entire domestic production for sales and production in at least eight European countries, with little or no impact on the small producer. Meanwhile, price guarantees and export subsidies enable EU producers, some as far north as Finland, to claim a significant share of the sugar market, even in tropical Africa. Joseph Daul, chairman of the EU parliament's agriculture and rural development committee, which must approve any sugar subsidy reform, is himself a major French sugar beet farmer (Hassett & Shapiro, 2003).

Due to subsidies, Europe is the world's largest exporter of white sugar, pushing more efficient producers in countries such as Malawi and Zambia out of regional markets. The same CAP restricts the entry of African sugar into EU markets. Mozambique, where 70% of the rural population lives below the poverty line, loses US\$ 100 million a year from EU subsidies. Like the U.S., the EU uses Africa as a dumping ground for surpluses. Everything from milk to wheat is sold at "giveaway" prices, destroying the markets on which small farmers depend. By

undermining local self-reliance, dumping, linked to subsidies by rich countries in Africa, is helping to create conditions for famine. In February 2003 at a summit of African leaders in Paris, President Chirac called for a moratorium on agricultural dumping in Africa (Palmer & Kline, 2003).

In 2004, challenged by Brazil, the WTO ruled that the EU is violating its commitments to the WTO by exporting up to 4 times more subsidized sugar onto world markets than is allowed (OXFAM, 2004b)

A recent study by the Institute of Economic Affairs in Britain estimates that EU agricultural policies have reduced African exports of:

- Milk by 90%;
- Livestock by 70%;
- Meat by 60%;
- Non-grain crops by 60%; and
- Grains by 40%.

They estimate that the CAP reduces Africa's potential export of agricultural products by half (50%). They estimate that without the CAP, the current US\$ 10.9 billion in annual food related exports from Sub-Saharan Africa (excluding South Africa) could grow to nearly US\$ 22 billion/year. The Washington-based Food Policy Research Institute (IFPRI) found in Sub-Saharan Africa that every US\$ 1 in agricultural income produces US\$ 1.42 in GDP⁴⁶⁶. Getting rid of CAP

⁴⁶⁶ Gross Domestic Product (GDP) is the market value of new goods and services produced by the input factors (capital and labor) located within the geographic boundaries of an economy. Gross National Product (GNP) allocates product according to the "nationality" of the owners of the factors. Gross Domestic Product (GDP) allocates product according to the "location" of the owners of the factors. $GDP = GNP - \text{Net Factor Payments (NFP)}$. NFP is the net income paid to domestically located factors by foreign owned factors.

could raise the GDP by US\$ 26.4 billion/year, increasing annual per capita incomes by 13% on the subcontinent (Hassett & Shapiro, 2003).

Agricultural Subsidies and Support in Europe and U.S. to Large, Not Small Farmers

The general trend, as noted in Europe but also in the U.S., is for subsidies and support to go mostly to the largest farmers, often corporate farms, not the small farmer. The Commission for Africa (2005) estimates that

“only 4% of EU support goes to 25% of the smallest farms, roughly the same in the U.S. with the largest 25% of the farms receiving over 70% of the support, reaching 80% in the U.S....It is estimated that a move to free-trade in sugar would raise world prices by something close to 40%, and could generate around US\$ 4.7 billion in welfare gains for the developing countries”.

According to IFPRI (2003), in the U.S. 60% of farmers get no support at all, while the biggest 7% account for 50% of government payments. Large corporate farms, making up 17% of the farms given subsidies, received 56% of total subsidy payments (Redline & Kline, 2007).

12.2.4.3 Tanzania and U.S./EU farm subsidies

“Northern import restrictions and production subsidies help to explain two features of the world agricultural trading system left intact under globalization: slow growth and continued domination by industrialized countries” (IFPRI, 2003).

Strolling around supermarkets in Dar es Salaam, it is easier to find boxes of orange juice from Dubai, lines of canned beef from the UK and butter and cheese from as far away as New Zealand than it is to find local produce. Because of these subsidies, Shoprite (a South African supermarket in Tanzania) will find it

easier to import something than to buy it locally. According to UN figures, approximately five million people are involved in cotton production in Tanzania, but for the last few years, the industry has remained idle because of heavy cotton subsidies (50%) in the United States. If the prices are bad, the private sector will not buy from the farmer. This has resulted in two or three successive years of the cotton being left in the fields without being bought, greatly affecting the farmers' livelihoods. Removing subsidies in the U.S. or the European Union (EU) is not a question of making people richer, but rather improving the living standards of rural populations, which account for some 85% of Tanzania's 31 million people and 350 million people across Sub-Saharan Africa. The impact of subsidies is far bigger than the small amount of foreign aid that this country is receiving. If people are going to talk about sustainable development, then they should get rid of subsidies (United Nations, 2002).

12.2.4.4 Cotton subsidies and protected markets

Africa's Comparative Advantage in Growing Cotton

Two advantages Africa has over the rest of the World for growing cotton are long growing seasons and low humidity. Cotton requires at least 200 days of relatively high temperatures. Temperatures below 20° C inhibit plant growth, especially during flowering and maturation of the boll. It grows best when the average temperature is 25° C. Cotton is drought tolerant and can grow well even in areas with rainfall under 500 mm/year, though higher rainfalls are preferred to assure economic yields of fiber. On the other hand, high humidity during maturation and the pre-harvesting period may result in the bolls rotting (Theron, 1977).

The downside is that cotton takes up tremendous amounts of nutrients in the soils, requiring mitigation by crop rotation with leguminous plants to replace nitrogen and control nematodes, and fertilizer additions based on laboratory testing of soils (Table 12.1).

Table 12.1: Nutrient removal from the soil by the cotton plant

<u>Yield Cotton/Seed (kg/ha)</u>	<u>Nitrogen (N) Removal By Cotton Plant (kg/ha)</u>	<u>Phosphorous (P) Removal By The Cotton Plant (kg/ha)</u>	<u>Potassium (K) Removal By The Cotton Plant (kg/ha)</u>	<u>Reference</u>
1,000	90	15	60	ARC (1996)
2,000	175	20	60	ARC (1996)
2,500	220	28	85	ARC (1996)
4,500+	250	30	140	ARC (1996)
1,608	105	18.4	66.4	Halevy & Bazelet, 1989 <i>In: Mayaka, 2002</i>

Source: Prepared by Authors

Analysis of petiole and leaf samples one week after the first flowers occur is recommended for testing to determine if there are micro-nutrient deficiencies (ARC⁴⁶⁷, 1996) such as boron (B), zinc (Zn), calcium (Ca.) and magnesium (Mg). Calcium deficiency can result in a shedding of bolls (Tobacco and Cotton Research Institute⁴⁶⁸, 1990). Soil pH is also critical, with the optimum range of 6.0-7.5. If the soil pH is too low, the uptake of certain nutrients will be negatively affected. Depending on the calcium/magnesium ratio in the soil, calcitic or dolomitic agricultural lime can be added to the soil to raise the pH (Tobacco and Cotton Research Institute, 1990). Failure to take these precautions can result in soil mining. Pesticides are also a requirement, although new pest resistant cultivars are being developed by groups like Monsanto, such as the stacked gene

⁴⁶⁷ Agricultural Research Council (ARC) of South Africa, 1134 Park Street, Hatfield, Pretoria, P.O. Box 8783, Pretoria, 0001, Tel: 27-12-427-9700, Fax: 27-12-342-3984, www.arc.agric.za.

⁴⁶⁸ Tobacco and Cotton Research Institute, Private Bag, X82075, Rustenberg, South Africa, Fax: 27-142-993113, jody@NITK1.AGRIC.ZA.

for “Bt” which controls the bore worm and a gene which makes the cotton plant resistant to the herbicide, RoundUp, used to control weeds in cotton fields (Hagedorn, *pers. comm.*).⁴⁶⁹ Cotton SA⁴⁷⁰ believes that this GM cultivar consisting of “stacked genes” will allow country’s like South Africa to double production (Louw, *pers. comm.*)⁴⁷¹, while others have raised a “red flag” (see Chapter 5, Section 5.12.1.2, Green revolution technologies - Green Revolution, South Africa).

U.S. Cotton Subsidies and Africa, Cultivating Poverty

As a result of the U.S. Farm Bill of 2002,

“the resulting loss of cotton exports amounts to 3% of the total economic output of Mali and Benin, the IMF said, and 1% to 2% for Burkina Faso and Chad. The damage exceeds the total value of the relief provided to those countries under a global debt relief initiative financed by wealthy nations and administered by the World Bank” (Vieth, 2002).

On the other hand,

“the World Bank estimates that the removal of protection and support in the cotton sector would increase prices by 13% over the next 10 years and world trade in cotton by 6%. Africa’s cotton exports would increase by 13%” (ILO, 2004).

There are 11 countries in Africa where cotton accounts for more than one-quarter (25%) of the export revenue, rising to one-half (50%) for Benin and two-thirds (67%) for Burkina Faso. These exports are a vital source of foreign exchange,

⁴⁶⁹ Hagedorn, E.W., Department of Agriculture, Tshwane University of Technology, Pretoria, South Africa

⁴⁷⁰ Cotton SA, P.O. Box 912 232 Silverton, Republic of South Africa, <http://cottonsa.org.za>.

⁴⁷¹ Koot Louw, Textile SA, Pretoria, South Africa. 27-12-804-1462.

financing essential imports such as food, fuel and new technologies. They also underpin government revenues, providing the funds needed to invest in health and education. A study of Sub-Saharan Africa carried out by the World Health Organization, found that households growing cotton and maize had better nutrition and higher income than households growing maize alone. Production was given a major boost by CFA devaluation in 1994, a move that enhanced export competitiveness and increased local prices. However, health risks and environmental pollution, caused by high pesticide and fertilizer use, have been overlooked. There are also inherent dangers in reinforcing dependence on a single crop, for which global markets are highly volatile (OXFAM, 2002a). There are however, other downsides to the CFA devaluation on the environment (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas).

In 2001/2002, America’s 25,000 cotton farmers received \$3.4 billion a year in subsidies, double the level in 1992 (OXFAM, 2002a; IFPRI, 2003; Palmer & Kline, 2003) for a crop valued at only US\$ 3 billion (Hayes, 2004). This increase in subsidies is a breach of the “Peace Clause”⁴⁷² in the WTO Agreement on Agriculture (OXFAM, 2002a). Under the 2002 U.S. Farm Bill, cotton farmers will receive a guaranteed price of around US\$ 1.14/kg (52 cents per pound), regardless of what happens to world market prices (which are currently 19% below that level). In addition, farmers will receive a further set of payments to top up their income to a target price level. The result will be that they will receive a price some 73% above world market levels (OXFAM, 2002a).

⁴⁷² Expired December 31, 2003 (OXFAM, 2004a). It is unclear if this was renewed or not.

The nearly US\$ 4 billion (OXFAM, 2002a) to US\$ 3-4 billion (Kousari, 2004) in subsidies received by 25,000 of America's cotton farmers in 2001/2002 year is:

- **Greater than the GNP (GNI)⁴⁷³ of many Sub-Saharan African countries (OXFAM, 2002A).**
- **More in subsidies than the entire GDP of Burkina Faso** – a country in which more than two million people depend on cotton production. Over half of these farmers live below the poverty line. Poverty levels among recipients of cotton subsidies in the US are zero (OXFAM, 2002a).
- **Negative to Mali, which received US\$ 37 million in foreign aid from USAID in 2001, but lost US\$ 42 million due to U.S./EU cotton subsidies (OXFAM, 2002a).** Mali is Africa's largest cotton producer, with an output of 600,000 tons in 2003, yet without a textile industry, processes only 1% of its cotton consumption. Millions of Malian farmers with 2 ha (5 acres) of cotton live on less than US\$ 1/day, while American farmers average about 405 ha (1,000 acres) (Dizolele, 2004).
- **Three times more in subsidies than the entire USAID budget for Sub-Saharan Africa's 500 million people (OXFAM, 2002a; Palmer & Kline, 2003; OXFAM 2004c).** Note – latest African population – 622-650 million in 2000 (see Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY).

The World Economic Forum (2004) estimates that cotton subsidies by the West shave about 10% from cotton prices, depriving poor African farmers of valuable income.

⁴⁷³ See Footnote 48, Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA.

“Removal of U.S. and EU cotton support is estimated to increase Sub-Saharan Africa cotton exports by 75%. African farmers are much more competitive than their U.S. and EU counterparts, producing a pound of cotton for 21 cents in Burkina Faso, compared with 73 cents in the U.S”. (Commission for Africa, 2005).

OECD cotton subsidies negatively impact an estimated 10-11 million small farmers in West Africa (IFPRI, 2003; Kousari, 2004; Commission for Africa, 2005).

These subsidies create a huge disadvantage for resource-poor African farmers and a parallel unfair advantage for their American counterparts. By driving down prices, U.S. taxpayers and their European counterparts in other product groups, bear a direct responsibility for poverty in Africa (OXFAM, 2002a). For instance, in Benin where cotton accounts for 7% of GDP and 40% of exports, a percentage point increase in world cotton prices from reduced subsidies would reduce poverty by 1.5 percentage points (World Economic Forum, 2004). A 25% increase in the world price of cotton, roughly corresponding to the effect of the elimination of U.S. subsidies, would cause the national incidence of poverty in Benin to decline by 4% (IFPRI, 2003 & Kousari, 2004), enabling 250,000 people to rise above the poverty line (IFPRI, 2003).

The USA is not the only country subsidizing cotton. “The EU provides up to US\$ 1 billion in support to EU cotton production” (Commission for Africa, 2005).

While there are a large number of countries producing cotton, just four – China, the U.S., India and Pakistan, in descending order – account for 67% (two-thirds) of total production. Most cotton is consumed in the country that produces it. The major exception to this rule is the United States. In a typical year, more than half of U.S. cotton is exported. Over the longer-term, subsidies have enabled the U.S.

to expand its share of world cotton production (on a linear trend basis) from around 16% at the start of the 1990s to over 20% at the end of the decade. The upshot is that the U.S. is, by some margin, the world's largest exporter of cotton (OXFAM, 2002a).

Because the U.S. is the world's largest exporter of cotton (OXFAM, 2002a; Palmer & Kline, 2003), accounting for 40% of the world market (IFPRI, 2003), these subsidies push down world prices, which have fallen by half since the mid-1990s (OXFAM, 2002a; Palmer & Kline, 2003). Adjusted for inflation, average prices for cotton are lower than at any time since the Great Depression of the 1930s, at just under US\$ 0.88/kg (US\$ 0.40/pound) in 2001/2002 versus a high of just over US\$ 1.98 /kg (US\$ 0.90 cents/pound) in 1995/96 (OXFAM, 2002a). OXFAM (2004c) estimates that U.S. dumping created losses of almost \$400 million for poor cotton-producing African countries between 2001 and 2003. The Commission for Africa (2005) estimates that

“U.S. support to its cotton farmers was \$US 3.9 billion in 2002, driving down world prices by 10-20%, with annual income losses in West African cotton producing countries estimated at \$US 250 million. This support is expected to stay at these levels for the next 6 years, ensuring that U.S. farmers get twice the current world price for cotton”.

Offenheiser (2006) estimates a loss of US\$ 200 million/year in income to ten million West African farmers due to US\$ 4 billion/year in U.S. government subsidies going to the 25,000 American cotton farmers. Basically, exports are going up, but countries are earning less.

The cotton subsidy program has also undermined the Heavily Indebted Poor Countries (HIPC) Initiative, costing countries such as Benin, Burkina Faso, Chad and Mali more than they have received in debt relief (OXFAM, 2002a). As an

example, the cost of lower cotton prices to Mali amounted to a loss of US\$ -43 million in 2001 (Kousari, 2002) to \$US -42 million (OXFAM, 2002a), exactly the amount of debt relief from the World Bank and the IMF in the same year, under the HIPC Initiative (Kousari, 2004). In 2001, lower cotton prices in Benin resulted in a 4% rise in poverty in 2001 (Kousari, 2004).

One major concern is that lower prices force desperate small farmers in already over-populated areas, such as Burkina Faso, to increase and/or maintain income levels by expanding production of cotton on marginal land, resulting in habitat degradation, and/or through the over-use of fertilizers and pesticides in attempting to increase production, resulting in soil and environmental degradation (OXFAM, 2002a). In Burkina Faso, soils have been so heavily mined of their nutrients that the extreme southern part of the country is the last area still suitable for cotton production (Pavy, *pers. comm.*). Ouattara (*pers. comm.*) from Banfora, southern Burkina Faso, explains that government provided fertilizer is available for cotton production, but it is inappropriate for the soils and actually contributes to soil degradation.

In the SADC region of Sub-Saharan Africa, (Louw, *pers. comm.*):

- 50,000 small Zimbabwe Farmers handpick and produce the least contaminated cotton in the world; and
- Two million small farmers grow handpicked cotton in Tanzania.

South Africa is the only country, as discussed in Chapter 5, where most cotton is produced by commercial farmers, although programs are underway by Cotton SA to increase production and the numbers of the currently 3,000 small farmers (Louw, *pers. comm.*) (see Chapter 5, Section 5.12.1.2, Green revolution technologies, Green Revolution, South Africa).

Africa's experience in cotton raises wider concerns about American policy. Through its aid program, the Bush Administration has sought to promote free-market reforms in Africa. Similarly, trade preferences under the African Growth and Opportunity Act (AGOA) are conditional on African governments liberalizing agricultural markets, including in the cotton sector. Yet when farmers in Mali or Burkina Faso enter world markets, they are forced to compete against heavily subsidized American exports.

"The result: farmers in poor countries earn far less for what they produce. Why does this matter for Africa? Because more than 10 million people in West Africa alone depend on cotton for cash to buy food and medicines, and to send their children to school. Lower prices mean more poverty in already desperately poor communities. Africa as a whole loses \$300 million a year as a direct result of US cotton subsidies" (Palmer & Kline, 2003).

Another concern is that a quarter of the world's pesticides are applied to cotton. There are risks of both environmental hazards and human health hazards (directly from contact while applying and indirectly from contaminating water supplies and the food chain) if farmers are not properly trained in its use (Madeley, 2002).

In 2004, in a landmark decision, the World Trade Organization (WTO) ruled in favor of Brazil's complaint that U.S. cotton subsidies distort world prices, violate global trade rules and price developing nations' goods out of markets (Clendenning, 2004a; 2004b; Hayes, 2004; OXFAM 2004b). The WTO panel found that (OXFAM, 2004c):

- U.S. cotton subsidies worth \$3.2 billion and export credits (for cotton and other commodities) worth \$1.6 billion, contravene WTO rules. This represents almost all cotton subsidies and close to 50% of all export credits used by the USA in 2002.

- The panel found that the USA used hidden export subsidies to circumvent its WTO commitment to reduce export subsidies. These subsidies are therefore, contrary to WTO rules and must be removed:
 - U.S. export credits for cotton, soybeans, corn, oilseed, oil products and rice, worth \$1.6 billion in 2002, constitute export subsidies.
 - The Step 2 Program,⁴⁷⁴ which amounted to \$415 million, constitutes an export subsidy rather than trade-distorting domestic support.

“Brazil's decision to take the issue to the WTO in February 2003 was the first challenge to the domestic farm policy of a rich country. The WTO interim ruling could lead to an avalanche of challenges against U.S., European and Japanese farm subsidies. It could weaken their defense of farm aid in the current Doha Round of global free-trade talks meant to wrap up this year...The cotton case could now encourage challenges to U.S. subsidies on goods such as soybeans, corn, wheat and rice...Brazil and the United States have until May 10 to respond to the decision before a final version is made public on June 18. The WTO then has up to three months to review any appeals” (Hayes, 2004).

Brazil's complaint to the World Trade Organization (WTO) about the U.S. cotton program constitutes “ ‘the most serious, full-frontal assault on the U.S. farm program in our history.’ ...the position of Sen. Pat Roberts, Republican from Kansas, according to his assistant legislative director and homeland security advisor, Mike Syfert... ‘The senator feels this case has the potential for impact not only to cotton, but wheat, maize, sugar cane, peanuts, sorghum, soybeans — everything,’ Syfert said at the joint meeting of the Cotton Foundation and the American Cotton Producers Association at Albuquerque, N.M”. (Brandon, 2004).

⁴⁷⁴ The Step 2 (subsidy) Program consists of two parts: it gives payments to bridge the difference between U.S. prices and the world market prices to exporters, as well as to domestic users of U.S. cotton (OXFAM, 2004c).

The U.S. appears to be continuing cotton subsidies in spite of the WTO ruling (Sharma, 2004b), possibly protected under the “Blue Box” or “Green Box” subsidy category (see Section 12.2.4, Agricultural Tariffs and Subsidies).

On October 18, 2004, The U.S. announced that it would appeal a World Trade Organization (WTO) ruling that had declared the majority of U.S. cotton subsidies illegal (OXFAM, 2004d). If the USA loses on appeal, it will be faced with a ruling that demands a deep reform of current subsidy programs. This could encourage a dangerous faction within the U.S. Congress, which is resisting WTO rulings on the principle of sovereignty. However, the USA would have a lot to lose if it were to refuse implementation, including (OXFAM, 2004c):

- **An overall reduction of the ambition of the Agreement on Agriculture** because developing countries and Cairns countries would conclude that the USA is not interested in reform.
- **A lost chance to reduce EU subsidies.** Given that the USA wants to discipline EU subsidies.
- **A lost opportunity to respond to demands made by West African countries to eliminate trade-distorting cotton subsidies.**
- **A weakening of the WTO and its Dispute Settlement Understanding** (DSU), the USA risking losing its ability to discipline practices of emerging markets such as India or China.

Offenheiser (2006) considered the December 2005 trade talks in Hong Kong as a “wasted opportunity for rich countries to deliver on development”, though there are slow movements in the right direction. The OECD countries agreed to end cotton export subsidies only by 2006 (Foster, 2005; Klug, 2005), though this must still pass the U.S. Congress where it is expected to receive stiff opposition (Blustein, 2005; Klug, 2005). “The U.S. is already obligated to eliminate export

subsidies for cotton under the Brazil-U.S. Cotton ruling...The commitment to cut domestic support on cotton was watered down from ‘will’ to ‘should’ ” (IATP, 2005). On December 21, 2005, the U.S. Congress voted US\$ 2.7 billion cuts in agricultural programs, a portion of this fulfilling U.S. obligation to terminate cotton export subsidies (Washington Post, 2005a). All export subsidies are to end by 2013.

By 2008, wealthy nations are to allow duty-free and quota-free-trade privileges for at least 97% of the products exported by the Least Developed Countries (LDCs) (Klug, 2005), comprising 32 countries, mostly in Sub-Saharan Africa (Blustein, 2005). The U.S. already imposes no barriers on most products from these countries, which tend to be raw as opposed to transformed (see Chapter 13, Section 13.13.6.2, AGOA), but this would expand the number. However, the U.S. textile industry objects to this, since on the list, both Bangladesh and Cambodia have competitive textile and apparel industries (Blustein, 2005). The remaining “3% gives the U.S. tremendous flexibility to protect products of real interest to LDCs, such as sugar and textiles” (IATP, 2005). The Washington Post (2005b) editorial page supports this conclusion. These agreements did not include cuts in import tariffs on transformed industrial products (Klug, 2005) (see Chapter 13, Section 13.13.6.2, AGOA). The U.S. avoided discussion of further cuts to its domestic farm subsidy program (Foster, 2005).

By October 2005, the U.S. trade deficit rose to an all time high of US\$ 68.9 billion (for the month),⁴⁷⁵ making one question how far any WTO agreement will get as it must win approval in both the House and Senate of the U.S. Congress (Associated Press, 2005; U.S. Census Bureau, 2005). In protecting its agricultural sector, France has vowed to prevent any further concessions by the 25 EU

⁴⁷⁵ The annual international deficit in goods and services trade for the U.S. reached a record level of \$726 billion in 2005, an 18% increase over 2004 mainly from increased oil prices and Chinese imports (EPI, 2006).

member bloc (Blustein, 2005). The EU refused further cuts on import tariffs on agricultural goods that it had promised to cut by an average of 46% that adversely impacted both U.S. and Developing World farmers, while also failing to get concessions from major developing countries in cutting tariffs on industrial goods and services (Foster, 2005). The adverse impacts of food dumping on developing world farmers have also been taken off the table.

“A series of recent economic studies, including from the World Bank, have steadily downgraded the projected benefits of greater liberalization, while the balance of benefits are now expected to accrue more to the 30 or so developed countries rather than to the approximately 120 others from the developing world” (IATP, 2005) (see Chapter 13, Section 13.12.6, “Fair-trade” Versus “Free-trade”).

This is highlighted by the April 2006 trade talks in which an OXFAM report suggests that

“current proposals would allow both the European Union (EU) and United States to actually increase their trade-distorting spending on agriculture” (Schlein, 2006).

In addition current proposals on Non-Agricultural Market Access (NAMA)

“poor countries will not be able to increase tariffs to protect their domestic sector from increased imports of industrial good”

and may carry over to disallowing tariffs in poor countries to control the dumping of subsidized agricultural products from rich countries that negatively impacts jobs and livelihoods (Schlein, 2006). Changing trade relations between the developed and developing world will likely be a long row to hoe.

Trade Agreements Hurt U.S. Textiles

In some cases, abiding by WTO rules can hurt both developing and developed countries. The United States is the world's biggest textile and apparel importer, buying more than US\$ 77 billion in 2003 of which US\$ 60 billion was subject to import quotas. By the end of 2004, quotas will end according to WTO agreements. U.S. mills that make fabric, thread and clothing lost over half their workers from 1.6 million at the end of 1994 down to 685,600 in 2004, with an expected drop to 449,800 by 2012 (i.e., loss of another 235,800 jobs) projected by the Bureau of Labor Statistics. This is from a combination of many companies moving overseas and increased competition from newly emerging players, especially China and to some degree Pakistan and India. More dire projections, unless there are major changes, are that 67% of the remaining jobs (459,352 out of 685,600) in the U.S. apparel industry could be lost in the next couple of years. The elimination of quotas will not only hurt U.S. workers, but less competitive developing countries (e.g., Bangladesh, Cambodia, Sri Lanka and Nepal), since they were often assured a small guaranteed market. China cannot block Special Safeguard Measures (SSG) as described above, a mechanism that would allow the U.S. Government to slow rapidly rising clothing and fabric imports, which China agreed to in 2001. U.S. textile companies are pushing for caps on Chinese made bras, dressing gowns and knit fabrics, product lines on which quotas were phased out in 2001 followed by skyrocketing Chinese imports. For instance, importation of knit fabric from China to the U.S. reached a peak of US\$ 42.9 million in 2003, an increase in percent by weight of 21,307 from the year 2000. Surprisingly, China has agreed to tax its clothing exports as a means of slowing overseas sales, though it is unclear if this will be significant. U.S. retail stores and U.S. apparel companies with operations overseas, are opposed to the extension of quotas. Projections are for more U.S. companies to move overseas, as well as to source clothes and materials from the Americas and South Asia (Sparshott, 2004). The

Sub-Saharan Africa textile industry will have to rely on preferential treatment from the U.S. under the African Growth and Opportunity Act (AGOA) until it can become competitive (see Chapter 13, Section, 13.13.6.2, AGOA). Overall, the United States had just over a US\$ 200 billion trade deficit with China for 2005 (EPI, 2006; Ho, 2006). Issues around this deficit include a Chinese currency kept at an artificially undervalued giving it an unfair-trade advantage, intellectual property rights to protect American products/patents from pirating and an agreement by China to buy US\$ 16 billion in American products (Ho, 2006).

12.2.4.5 Sub-Saharan Africa marine fisheries and EU subsidies

“For African LDCs seafood exports are worth \$US 570 million - Senegal 28%, Tanzania 19%, Mozambique 12%, Uganda 11% Angola 6%...Seafood exports have grown in importance in Africa in recent years, with exports in SADC quadrupling to \$US 892 million between 1998 and 2001. By that date, African exports to the EU had reached \$US 1.75 billion. Yet the EU subsidizes this sector heavily, at around \$US 1 billion annually: \$US 280 million of which supports 850 vessels to fish outside EU waters. When coupled with highly onerous and perversely worded rules of origin, African exports to the EU are even further undermined. Fishing agreements that allow European boats to fish African waters are often badly negotiated. They only return around \$US 0.8 billion in royalties, and EU tuna boats in five West African states pay less than 1% of the value of the catch to these governments (a governance problem). Transparent and competitive tendering, including more organized action at the regional level, could go some way to ensuring Africa gains from the contracts it offers. At the same time, the subsidized EU fleets have superior equipment, which means they can catch far more than the African boats” (Commission for Africa, 2005).⁴⁷⁶

⁴⁷⁶ “the EU ‘list rules’ for fisheries: "1. The following shall be considered as wholly obtained in a beneficiary country or in the Community: (f) products of sea fishing and other products taken from the sea outside its territorial waters by its vessels;(g) products made on board its factory ships exclusively from the products referred to in (f); 2. The terms ‘its vessels’ and ‘its factory ships’ in paragraph 1(f) and (g) shall apply only to vessels and factory ships: which are registered or recorded in the beneficiary country or in a Member State; which sail under the flag of a beneficiary country or of a Member State; which are at least 50% owned by nationals of the beneficiary country or of Member States or by a company having its head office in that country or

12.2.4.6 Would ending food dumping negatively impact food security?

According to IFPRI (2003), an end to export dumping by rich countries would not hurt food security in developing countries:

“Standard consumer welfare models tend to obscure the damage caused by agricultural dumping. Export subsidies in industrialized countries undermine incentives for small farmers in developing countries, and destabilize local markets”.

Ending food dumping in the long-run could help food security by forcing African governments to invest in agricultural research, extension and infrastructure for the small farmer. IFPRI (2003) found that food dumping, as a source of cheap food to urban populations, is a disincentive for Sub-Saharan African countries providing

“a rationale for failing to give priority to the economic setting in which small farmers operate and for neglecting rural infrastructure. In fact, public investment in agriculture and rural development had fallen off the agenda of ministries of finance, despite the developmental payoffs”.

12.2.5 ILO Demands an End to Subsidies and Trade Barriers

“Many developing countries and LDCs still depend on agricultural commodities for more than half their export earnings. Yet from 1980 to 2000, world prices for 18 major export commodities fell

in one of those Member States, of which the manager or managers, Chairman of the Board of Directors or of the Supervisory Board, and the majority of the members of such boards are nationals of that beneficiary country or of the Member States and of which, in addition, in the case of companies, at least half the capital belongs to that beneficiary country or to the Member States or to public bodies or nationals of that beneficiary country or of the Member States; of which the master and officers are nationals of the beneficiary country or of the Member States, and of which at least 75% of the crew are nationals of the beneficiary country or of the Member States” (Commission for Africa, 2005). Thus, fish taken in foreign waters would be dealt with as though taken from national waters with regards to, tariffs, quotas, taxes, etc.

by 25% in real terms. This fall was particularly significant in the case of cotton (-47%), coffee (-64%), rice (-60.8%), tin (-73%), cocoa (-71.1%) and sugar (-76.6%). There is no simple answer to this problem. However, as a minimum, it is essential that the aggravating effect of agricultural protectionism be removed...Technical support should be stepped up to assist developing countries to diversify their exports and add value to commodities before exporting them. In this regard, the issue of tariff escalation for processed commodities needs to be addressed. In addition, a global coordinated effort should be made on particular commodities such as sugar, cotton, wheat and groundnuts" (ILO, 2004).

12.3 STRUCTURAL ADJUSTMENT, IMF AND THE WORLD BANK

The Meltzer Commission (officially called the International Financial Institution Advisory Commission) was established in 1998 by the U.S. Congress to recommend future U.S. policy toward seven international financing institutions. The Meltzer Commission consisted of some of America's most eminent economists, including, Allan H. Meltzer, Professor of Political Economy at Carnegie Mellon University and a Visiting Scholar at the American Enterprise Institute; Jeffrey D. Sachs, Director of the Center for International Development and the Galen L. Stone, as well as Professor of International Trade in the Department of Economics at Harvard; C. Fred Bergsten, Director of the Institute for International Economics; Charles W. Calomiris, Paul M. Montrone Professor of Finance and Economics at the Columbia University Graduate School of Business and a Professor in the Department of International and Public Affairs at Columbia University's School of International and Public Affairs; Tom Campbell, member of Congress from California's 15th district and Professor of Law at Stanford University and Edwin J. Feulner, president of the Heritage Foundation. They concluded the following with regard to the IMF and World Bank:

"The frequency and severity of recent crises raise doubts about the system of crisis management now in place and the incentives for private actions that it encourages and sustains. The IMF has given too little attention to improving financial structures in developing countries and too much to expensive rescue operations. Its system of short-term crisis management is too costly, its responses too slow, its advice often incorrect, and its efforts to influence policy and practice too intrusive.

High cost and low effectiveness characterize many development bank (e.g., African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) operations as well. The World Bank's evaluation of its own performance in Africa found a 73% failure rate. Only 1 of 4 programs, on average, achieved satisfactory, sustainable results. In reducing poverty and promoting the creation and development of markets and institutional structures that facilitate development, the record of the World Bank and the regional development banks leaves much room for improvement...For the world's truly poor, the provision of improved levels of health care, primary education and physical infrastructure, once the original focus for development funding, should again become the starting points for raising living standards. Yet, poverty is often most entrenched and widespread in countries where corrupt and inefficient governments undermine the ability to benefit from aid or repay debt. Loans to these governments are, too often, wasted, squandered, or stolen...The use of IMF resources and conditionality to control the economies of developing nations often undermines the sovereignty and democratic processes of member governments receiving assistance...The G-7 governments, particularly the United States, use the IMF as a vehicle to achieve their political ends. This practice subverts democratic processes of creditor countries by avoiding parliamentary authority over foreign aid or foreign policy and by relaxing budget discipline...IMF interventions---both long-term structural assistance and short-term crisis management---have not been associated, on average, with any clear economic gains to recipient countries..." (Meltzer Commission, 2000).

As Stiglitz⁴⁷⁷ (2002) puts it, a half century after its founding, the IMF has failed with an ideologically, as opposed to technically driven, “one size fits all” recipe for curing the economic ills of the developing world. The UN (2002) has a similar view of the IMF,

“concerns are frequently expressed about the breadth of Fund conditionality, the perceived arrogance of its staff, the application of a one-size-fits-all approach to policies, and insensitivity to political realities”.

Stiglitz (2002) and Sachs (2005) explain that Washington Consensus policies were based on a simplistic model of market economy, the “competitive equilibrium” model of Adam Smith⁴⁷⁸ that markets by themselves will lead to efficient outcomes driven by a profit motive. Government was to stand aside. This “neoliberal model”, based on free-market fundamentalism *laissez-faire* policies, was popular in the 19th century. However, as the result of the Great Depression and recognition for its failings in the market system, from massive inequality to pollution and decaying cities, the more advanced industrial countries rejected this economic model in favor of government interventions, the degree of intervention and balance between government and markets being debatable (Stiglitz, 2002). The key point here is that the IMF has been imposing on the developing world an economic model the West rejected 70 odd years ago. The relations between the government and the dependence of the private sector on the government to create an enabling environment for the private sector, has been discussed above, (see Section 12.2.2 Subsidies, Don’t Do As I Do, Do As I Say). Stiglitz (2002) also believes mistakes in sequencing these conditionalities without appropriate safety nets was a major problem. He gives examples of eliminating

⁴⁷⁷ Joseph Stiglitz, 2001 Nobel Prize Winner for Economics, Chief economist at the World Bank until January 2000, past Chairman of Clinton’s Council of Economic Advisors, currently Professor of Finance and Economics at Columbia University.

⁴⁷⁸ English economist, 1723-1790, considered founder of modern free-market\conomics.

corrupt marketing boards or downsizing government without first having lined up private sector investments to absorb these people and the boards, abandoning uniform pricing before adequate roads were in place, making it uneconomical for farmers far removed from the market place, the lack of property/resource rights and a court system to enforce these rights. Other examples include privatizing water and electrical utilities, resulting in price increases that the poor cannot sustain, in turn resulting in power and water cuts (Bond, 2002). Without government to allow a slow and progressive transition from public to private sector and to play an appropriate regulatory and facilitative role, the poor only became poorer (see Chapter 11, Section 11.11.6.2, Modern conservation and the Baka Pygmy, discussing impacts of privatizing marketing boards). He argues that proper sequencing and pacing might have enabled one to gradually achieve efficiency gains without these tremendous social costs. Stiglitz (2002) also believes that the IMF structural adjustment policies indicate that its clients are international banks and creditors, rather than developing countries and the poor. Actions are taken to assure that bank's/creditor's loans are paid back regardless of the consequences to the global economy or the welfare of the poor countries, with the net result that IMF policies in the long-term undermine the market, as well as the stability of the economy and society in the developing world

.
Africa and Africans are losing and this could come back to bite the West because of the anger and hatred towards the West, especially America, by the impoverished masses that are today aware, through modern communications such as the Internet and CNN, what the rest of the World has and they do not. Africans are increasingly aware that the wealth in their countries is being extracted by the political elite in collusion with Western Multi-Nationals. This makes much of Africa, a large portion which is Muslim (see Chapter 13, Figure 13.2: Muslim Africa), a hot bed for recruitment of terrorists among the disenfranchised youth who have given up any hope for a viable future and who have little or no regard

for their governments who are corrupt and self-serving. This will be discussed in greater detail in Chapter 13. Ultimately, structural adjustment (ESAP) became known as “Eternal Suffering for African People” (Bond & Manyanya, 2003).

12.3.1 IMF and the World Bank

“Our dream is a world free of poverty”, World Bank corporate motto. “The IMF is a toy of the United States to pursue its economic policy off-shore”, according to MIT economist, Rudiger Dornbusch (*Journal of Commerce*, 1999 In: Sogge (2002)).

The IMF and World Bank lend to the developing world, but are led by the developed world. To date, the head of the IMF is always a European and that of the World Bank, always an American elected behind closed doors with no prerequisite of having experience in the developing world (Stiglitz, 2002).

“Unfortunately, we have no world government, accountable to the people of every country, to oversee the globalization process...Instead we have a system that might be called ‘global governance without global government’...Modern high-tech warfare is designed to remove physical contact: dropping bombs from 50,000 feet ensures that one does not ‘feel’ what one does. Modern economic management is similar: from one’s luxury hotel, one can callously impose policies about which one would think twice if one knew the people whose lives one was destroying” (Stiglitz, 2002).

Thus, Stiglitz argues, the IMF, World Bank and WTO are public institutions, isolated from their constituencies and are answerable to no one for their actions, regardless of the consequences. They demand transparency from the rest of the world while they have little or no transparency, with many decisions being made that are not open to public scrutiny or debate, undermining the very idea of open societies and democracy.

“The World Bank and International Monetary Fund (IMF) were created at the Bretton Woods Conference in New Hampshire, U.S.A., in 1944. They were designed as pillars of the post-war global economic order. The World Bank’s focus is the provision of long-term loans to support development projects and programs. The IMF concentrates on providing loans to stabilize countries with short-term financial crises” (Smith, 2001).

Many in the world today see

“America as ‘controlling the global economy,’ either through its multinationals or its ‘puppets’, the World Bank and International Monetary Fund (IMF)” (Chua, 2003).

“The rules of modern world trade (the IMF/World Bank/GATT/NAFTA/WTO/MAI/FTAA)⁴⁷⁹ defined by corporations, and those rules enforced by the financial and military might of powerful nations essentially governed by those same corporations, define today’s world trade as corporate imperialism. Besides the military, which is the final arbiter, the power of the imperial centers of capital to lay claim to the wealth of the developing countries rests in their monopolization of finance capital. No bank in the world will loan to a country blacklisted by the World Bank...Corporate mercantilists moving to areas with cheap labor, tax breaks, ransom payments, and no environmental protections are transferring to society what are properly industrial production costs and banking those unpaid costs as profits” (Smith, 2001).

The net result is more poverty, less education for the poor and profits for the multi-nationals and the already super-rich, often political elite of the host country (Chomsky, 1999). Up until now, in most cases, no middleclass has been created and pollution, both in the work place and externally, has been a major problem.

⁴⁷⁹ General Agreement on Tariffs and Trade (GATT); North American Free-Trade Agreement (NAFTA); World Trade Organization (WTO); Multilateral Agreement on Investment (MAI); Free-trade Area of the Americas (FTAA), expansion of NAFTA.

The World Bank and IMF became increasingly powerful in Africa with the economic crisis of the early 1980s (Patel & Delwiche, 2002). In the late 1970s, rising oil prices, rising interest rates and falling prices for other primary commodities left many poor African countries unable to repay mounting foreign debts (Smith, 2001; Colgan, 2002; Legum, 2002; Zack-Williams, 2002 *In: Zack-Williams, et al.*, 2002).

To assure that the IMF and World Bank had plenty of disciples singing the same tune, technocrats were trained in fundamental economic doctrine, beginning as early as the 1970s that took up key government positions in Latin America, Indonesia and eventually, Russia. In 1990, the World Bank and UNDP created the African Capacity Building Initiative, which by 2001 was training central bank and finance ministry staff, teaching at 33 African universities along with research and joint projects. Since 1964, the IMF has trained more than 10,000 officials world-wide in its policies and practices. This coercion, social engineering, reduced public services and leadership indifference to citizen's wishes has triggered violence (Sogge, 2002) across the African continent and many other places in the world. Former chief economist and vice president of the World Bank from 1992-1997, Joseph Stiglitz, had this to say about IMF policies:

"Since the end of the Cold War, tremendous power has flowed to the people entrusted to bring the gospel of the market to the far corners of the globe. These economists, bureaucrats, and officials act in the name of the United States and the other advanced industrial countries, and yet they speak a language that few average citizens understand and that few policymakers bother to translate. Economic policy is today perhaps the most important part of America's interaction with the rest of the world. And yet the culture of international economic policy in the world's most powerful democracy is not democratic" (Stiglitz, 2000).

He goes on to explain how the IMF's and the U.S. Treasury Department's "cookie cutter" approach to macroeconomic policy helped fuel economic crises in East Asia and Russia by, among others; 1) Liberalizing their financial and capital markets, 2) Cutting subsidies for food and fuel, 3) Devaluation of local currencies and 4) Privatizing industries (necessary) in a manner that benefited only a few elites (Stiglitz, 2000) (see Sections 12.3.4.2, Structural adjustment and privatization of parastatals & 12.3.4.4, Trade and structural adjustment policies [SAP]). In Russia while

"only 2% of the population had lived in poverty even at the end of the dismal Soviet period, 'reform' saw poverty rates soar to almost 50%, with more than half (50%) of Russia's children living below the poverty line" (Stiglitz, 2000).

This is supported by UNCTAD (2001 *In: House of Commons*, 2002), stating that

"concerns increased in the aftermath of the East Asian crisis, when excessive conditionalities led to policy responses which intensified the crisis. As a result, there have been calls, including within the International Monetary and Financial Committee, for the streamlining and refocusing of surveillance in line with the Fund's (IMF) core competence in macroeconomic policy and related reforms".

Stiglitz (2002) explains that the World Bank and especially the IMF and their policies are heavily controlled by the U.S. Treasury Department, which in turn is closely linked to the narrow interests of the Wall Street financial community. In many instances, the Treasury Department went around the wishes of the U.S. Congress (Stiglitz, 2002) who appeared to play "second fiddle" to Wall Street, many of the IMF's and the Treasury Department's key decision-makers seeming to rotate in and out of Wall Street; i.e. Stan Fischer⁴⁸⁰ and Robert Rubin.⁴⁸¹ Very often, the very policies imposed on other countries were the opposite of those that

⁴⁸⁰ Fischer went from Deputy Managing Director of IMF to vice chairman of Citigroup.

⁴⁸¹ Robert Rubin went from chairman of Citigroup to Secretary of Treasury, where he had a central role in IMF policies.

Stiglitz recommended as chairman of the Council of Economic Advisors to the President of the United States during the William (Bill) Jefferson Clinton Administration. For instance, the Washington Consensus believed in the ideology of trickle-down economics, that is growth trickling down to the poor, a policy the Clinton administration argued against in favor of active programs to help the poor (Stiglitz, 2002). Dr. Stiglitz was forced to resign from the World Bank for his stance over these issues; for speaking out (Palast, 2001).

It will be seen below that many of these same policies are plaguing Africa and from an economic, development and conservation standpoint, have been catastrophic to the continent's people and their future. Dr. Stiglitz, the 2001 Nobel Prize winner in economics, has called for a Post-Washington Consensus. Since the early 1980s, the "Washington Consensus" of free-market fundamentalism and its hegemonic ideology-shaped economic policy has been imposed to the detriment of billions of people worldwide. This free-market formula is being rejected in many spheres, especially since the East Asian crisis of 1997 (Bond & Manyanya, 2003). As discussed, even the USA protects many of its fragile economic sectors against international competition in order for them to survive, rebuild and continue employing people.

12.3.2 IMF and the World Bank, Instruments of the Cold War

"The World Bank and IMF were important instruments of Western powers during the Cold War in both economic and political terms. They performed a political function by subordinating development objectives to geo-strategic interests. They also promoted an economic agenda that sought to preserve Western dominance in the global economy. Not surprisingly, the governments of the world's richest countries direct the World Bank and IMF. Combined, the 'Group of 7'⁴⁸² (U.S., Britain, Canada, France, Germany, Italy and Japan), hold more than 40% of the votes on the Boards of Directors of these institutions. The U.S. alone accounts for almost 20%" (Colgan, 2002).

⁴⁸² The G-7 is now the G-8 with Russia joining the group.

During the Cold War, Africa became a chessboard where the ideological differences between the West (North America and Europe) and East (Former Soviet Union, China and Cuba) were played out, while the people of Africa were expendable “pawns” who suffered the consequences. The key for the West was to keep the physical and ideological presence of the East off the African continent at all costs, to maintain the West’s presence on the continent and to secure the vote of African countries in key international forums, such as the United Nations and even the Convention on International Trade in Endangered Species (CITES).

Both sides were at fault.

“First, the displacement of democracies in poor countries, particularly in Africa, often occurred during the Cold War with the connivance of the great powers. Whenever a military strongman displaced a democratic government, the new military dictatorship tended to get support from the Soviet Union (if the new military rulers were pro-Soviet) or from the United States and its allies (if the new rulers were anti-Soviet and pro-West). So there is culpability on the part of the dominant powers in the world, given past history, and there is some responsibility now for rich countries to help facilitate the expansion of democratic governance in the world” (Sen, 2002).

“The U.S. Central Intelligence Agency (CIA) reported in 1995 that money from International Monetary Fund (IMF) loans was going to Swiss banks. President Bill Clinton and Secretary of State Madeleine Albright acknowledged the United States’ Cold War ‘complicity with tyrants and warlords across Africa’. Now that the tyrants are gone, the men, women and children of Africa carry the debt burden. The debts include those incurred by Liberian Samuel Doe for US \$1.3 billion; Somalia’s Mohammad Siad Barre for \$2.4 billion and Sudan’s Gafaar Nimeiri for an astonishing \$16.7 billion, etc. When Mobutu Sese Seko⁴⁸³ was overthrown and died in 1998, the debt was over \$13 billion. The West backed Mobutu as a loyal ally in the Cold War. As early as 1974 there were warnings of loans being stolen. In 1978 the IMF’s Erwin Blumenthal resigned from a key post in Zaire’s central bank saying that ‘the corruptive

⁴⁸³ Of the former Zaire, today’s the Democratic Republic of Congo.

system in Zaire with all its wicked and ugly manifestations' was so serious that there is 'no (repeat: no) prospect for Zaire's creditors to get their money back.' After Blumenthal's report to the IMF, it tripled its lending to Zaire. In 1987, when Mobutu made his territory available for U.S. covert action against neighboring Angola, the U.S. pushed through yet another IMF loan to Zaire – this time over the objections of some IMF officials. Nigeria estimates that former military governments have stolen billions of dollars, and deposited these in British, U.S. and Swiss banks. Nigeria's foreign debt is now \$34 billion (a country rich in oil that has no reason to be indebted to anyone). The U.S.-based Citibank has a special 'private banking division' which was set up to deal with just this sort of money. On 8 November 1999, it gave the U.S. Senate Governmental Affairs Committee details of accounts of four wealthy developing country leaders, Raul Salinas, brother of a former President of Mexico, \$80-\$100 million; former Pakistan Prime Minister Benazir Bhutto, \$40 million; Gabon President Omar Bongo, \$130 million; and the sons of Nigeria's former dictator Sani Abacha, \$110 million" (Hanlon & Pettifor, 2002).

Dakar, Senegal was an emergency "Transoceanic Abort Landing (TAL) site for the Space Shuttle until July 1988 when Banjul International Airport in the Republic of the Gambia was activated (NASA, 2006). Additionally, Dakar is the furthest western point in West Africa. During the Cold War of the 1970s and 80s, it is said that deepwater channels off of Dakar served as important areas of movement for Western submarines. So-called Russian fishing vessels, which among them were alleged spy vessels, were only allowed to dock in Dakar to exchange crews via a periodic Aeroflot flight. It is alleged that both France and the USA dumped money directly into government coffers to pay functionaries and it is known that France/EU helped subsidize Senegal's peanut economy (see Chapter 5, Section 5.6.3.2, Foreign assistance in Sahel goes for large scale as opposed to improving traditional agriculture - Cold War Politics and Western Donor Impacts on Food Production, Senegal and Chapter 11, Section 11.6.7, Foreign Aid and Puppet Governments – "Donor Democracy"). In other words, Senegal, as a geo-strategic location, had an "artificial economy" propped up by the West at all costs, as long as it remained on the side of the West and minimized

the presence of Russia and other communist regimes. For instance, China's only presence in the region was in the form of building soccer stadiums and providing some doctors in rural areas, but ideologically, Senegal was pro-Western with a lot of "influence" from both France and the United States. It seemed like debts were written off and/or rescheduled/restructured on a regular basis linked to the adoption of structural adjustment policies (Colgan, 2001). Western donors, including the IMF and World Bank, played a major role in assuring allegiance to the West.

More recently, the Wall Street Journal and the Washington Times have run articles in 2005/2006 accusing the IMF of supporting debt relief to the Denis Sassou-Nguesso regime of Congo Brazzaville (see Chapter 13, Section 13.10.1.4, Petroleum war, Congo Brazzaville), even after audits indicate siphoning off oil money into front companies run by his son and the chief of the new state oil company, *Société Nationale des Pétroles du Congo* (SNPC). The IMF executive board approved a key December 2004 agreement with Congo Brazzaville just weeks after Congo Brazzaville engaged a revolving-door Washington-based consulting firm made up of former IMF senior officials, up to and including a former deputy managing director. There is a call for the world's multi-national institutions such as the UN (Oil-for Food debacle in the Iraq), the IMF and the World Bank and their bureaucrats to be held accountable for their performance and conflict of interest (Rahn, 2006). To this should be added bilateral donors, international consulting firms and NGOs (see Chapter 11, Section 11.7.2, Foreign Assistance Conditionalities Good Business For Donor County Not Recipient/Host Country), as well as the international private sector in general (see Chapter 13 in general and Section 13.12.1 "Publish What You Pay" an Attempt at Developing Transparency in Distribution of Wealth from Africa's Natural Resources).

Post Cold War or African Independence transitions to democracy were merely negotiated elite power-transfers. Below the façade of multi-partyism, the overall parameters were set in Washington. Most deals left the economic status quo intact no matter how unequal and unsustainable. Transitions replaced the repression of generals/politicians with neo-liberals favored by bankers and businessmen. The new ruling elite went along for the ride and/or bought into the Washington Consensus ideology (Bond & Manyanya, 2003).

12.3.3 Structural Adjustment and Cross Conditionalities

“World Bank and IMF (structural) adjustment programs differ according to the role of each institution. In general, IMF loan conditions focus on monetary and fiscal issues. They emphasize programs to address inflation and Balance of Payments (BOP)⁴⁸⁴ problems, often requiring specific levels of cutbacks in total government spending. The adjustment programs of the World Bank are wider in scope, with a more long-term development focus. They highlight market liberalization and public sector reforms, seen as promoting growth through expanding exports, particularly of cash crops. Despite these differences, World Bank and IMF adjustment programs reinforce each other. One way is called ‘cross-conditionality.’ This means that a government generally must first be approved by the IMF, before qualifying for an adjustment loan from the World Bank. Their agendas also overlap in the financial sector in particular. Both work to impose fiscal austerity and to eliminate subsidies for workers, for example. The market-oriented perspective of both institutions makes their policy prescriptions complementary” (Colgan, 2002).

⁴⁸⁴ A comprehensive statement of a country’s economic transactions with the rest of the world for a given period of time - normally a quarter or a year - composed of the current account (measures transactions associated with trade in goods and services, investment income and transfers) and the capital account (measures financial flows such as purchases of bonds and equities or direct investment activities). BOP not to be confused with the balance of trade - a narrower concept that measures only trade in goods and services (GOC, 2005).

12.3.4 Structural Adjustment, U.S. Movement to Control Developing Economies

As a result of structural adjustment policies,

“many are caught in a series of vicious spirals: lack of food leads to poor health, which limits their earning ability, leading to still poorer health. Barely surviving they cannot send their children to school, and without an education, their children are condemned to a life of poverty”, this poverty being passed on to the next generations (Stiglitz, 2002).

Structural adjustment programs have failed to induce sustainable growth, let alone development in any African country. They have also failed to alter the way in which politics works in contemporary Sub-Saharan Africa. African elites have instrumentalized structural adjustment politically as a scapegoat for national economic crises, while extracting continual foreign aid to maintain their power base (Chabal & Daloz, 1999).

“It was U.S. policy during the Reagan Administration in the early 1980s, to expand the role of the World Bank and IMF in managing developing economies. The dependence of African countries on new loans gave the World Bank and IMF great leverage. The conditions attached to these loans required African countries to submit to economic changes that favored ‘free-markets.’ This standard policy package imposed by the World Bank and IMF was termed ‘structural adjustment.’ This referred to the purpose of correcting trade imbalances and government deficits. It involved cutting back the role of the state and promoting the role of the private sector. The ideology behind these policies is often labeled ‘neoliberalism,’ ‘free-market fundamentalism,’ or the ‘Washington Consensus.’ From the 1970s on, this orientation became the dominant economic paradigm for rich country governments and for the International Finance Institutions (IFIs).

The basic assumption behind structural adjustment was that an increased role for the market would bring benefits to both poor and rich (trickle down economics). In the Darwinian world of international markets, the strongest would win out. This would encourage others to follow their example. The development of a market economy with a greater role for the private sector was therefore seen as the key to stimulating economic growth. The crisis experienced by African countries in the early 1980s did expose the need for economic adjustments. With declining incomes and rising expenses, African economies were becoming badly distorted. Corrective reforms became increasingly necessary. The key issue with adjustments of this kind, however, is whether they build the capacity to recover and whether they promote long-term development. The adjustments dictated by the World Bank and IMF did neither" (Colgan, 2002).

Geo-politically, by keeping countries indebted, while pouring in large amount of "foreign aid", the West was able to keep Sub-Saharan African countries poor, dependent and exploitable by the West, both from the standpoint of natural resources and for ideological/political purposes.

Structural adjustment grew out of the World Bank's prognosis in the early 1980s of the sources of economic decline in Africa (Martin & O'Meara, 1995):

- Structural: History, politics, geography and climate;
- External: Disadvantaged position of African economies in the international market place; and
- Domestic Policies: Exchange rates, agriculture and the government's role in the economy.

The major problem for Sub-Saharan Africa began in the 1970s and 1980s when prices for most of their primary exports (e.g., coffee, cocoa, copper, oil) collapsed.

"In the early 1980s, Africa's debt crisis worsened. The ratio of its foreign debt to its export income grew to 500%. African countries needed increasing amounts of 'hard currency' to repay their external debts (i.e. convertible foreign currencies such as dollars and deutschmarks). But their share of world trade was decreasing and their export earnings dropped as global prices for primary commodities fell. The reliance of many African countries on imports of manufactured goods, which they themselves did not produce, left them importing more while they exported less. Their Balance of Payments problems worsened and their foreign debt burdens became unsustainable.

African governments needed new loans to pay their outstanding debts and to meet critical domestic needs. The World Bank and IMF became key providers of loans to countries that were unable to borrow elsewhere. They took over from wealthy governments and private banks as the main source of loans for poor countries. These institutions provided 'hard currency' loans to African countries to insure repayment of their external debts and to restore economic stability" (Smith, 2001).

While African countries needed sources of finance, Western banks sought outlets for monetary reserves, which the Organization of the Petroleum Exporting Countries (OPEC) had placed with them as a result of oil price hikes, which also hurt the emerging African nations. Loans were provided to African nations, with low interest rates, which were rolled over to the point that it became difficult to pay off the interest, let alone the loans. In turn, the IMF provided loans to these countries, undertook debt swaps or rescheduled debt under the conditions they followed prescribed economic policy reforms under the guidance of the IMF and World Bank (Colgan, 2001; Legum, 2002). Rescheduling became a ritual; by 1990, 30 African countries negotiated 120 debt reschedulings (Meredith, 2004). Between 1985 and 1990, Sub-Saharan Africa paid out more in interest to the IMF and the World Bank combined than it received from them in foreign grants and loans (Helleiner, 1992 *In: Martin & O'Meara, 1995*).

The structural adjustment programs of the early 1980s were meant to provide temporary financing to borrowing countries to stabilize their economies. These loans were intended to enable governments to repay their debts, reduce deficits in spending and close the gap between imports and exports. Gradually, these loans evolved into a core set of economic policy changes required by the World Bank and IMF. They were designed to further integrate Sub-Saharan African countries into the global economy, to strengthen the role of the international private sector and to encourage growth through trade. Faced with the threat of a cutoff of external funds needed to service the mounting debts they had incurred from the Western private banks that had gone on a lending binge in the 1970s, these countries had no choice, but to implement the painful measures called “conditionalities” demanded by the Bank and Fund. These usually included (Bello & Cunningham, 1994; Martin & O’Meara, 1995; Colgan, 2002; Stiglitz, 2002):

- Cutbacks in government expenditures, especially in social spending (e.g., education and health);
- Rollback or containment of wages;
- Privatization of state enterprises and deregulation of the economy;
- Elimination or reduction of protection for the domestic market and less restrictions on the operations of foreign investors;
- Successive devaluations of the local currency in the name of achieving export competitiveness;
- Increased interest rates; and
- Elimination of food and agricultural subsidies.

The underlying intention was to minimize the role of the state (Martin & O’Meara, 1995; Chabal & Daloz, 1999, Colgan, 2002; Stiglitz, 2002). Rosenblum & Williamson (1987) consider IMF measures a “pernicious form of neo-colonialism”.

12.3.4.1 Downsizing governments

Regardless of fiscal measures taken, many African governments and countries as currently delineated are not economically viable. For every resource rich Angola, The Democratic Republic of Congo and Gabon, that has a wealth of resources, there is a resource poor Gambia, Mauritania, Niger, *République Centrale Africaine* (RCA)/Central African Republic (CAR) and Somalia (see Chapter 11, Section 11.2.2, Economic viability of Sub-Saharan African countries at independence and Chapter 13, Section 13.18.1, Going Local Where Necessary, Development of Regional Markets).

This is a major reason that central governments are reluctant to return Sub-Saharan Africa's natural resources to their rightful owners, the rural communities living with these resources (see Chapter 9, Section 9.7.2, Reluctance to Devolve Control and Ownership of Resources to Landholders). Top heavy, expensive bureaucracies feel they need the wealth directly from these resources in order to survive, as opposed to taxation of the rural resource owners, allowing this wealth to stay in the rural areas, trickling its way up to the capital as it exchanges hands many times, creating a vibrant consumer economy. The political elite in the governments often go into partnership with the private sector, Western NGOs and donors to extract the wealth of rural Sub-Saharan Africa (e.g., timber, wildlife, fish and minerals) to the benefit of these stakeholders, while rural Africans only become poorer (see Chapters nine and 11). This has stymied the evolution of a formal African private sector, keeping most entrepreneurs small and driven into underground non-formal economies; African governments acting as both "player and referee" setting the rules and extracting the benefits directly.

A major problem that structural adjustment was to address, the over-dependence on African governments as the major employer of educated people, resulted from

there being little of a “formal” private sector. As René Dumont (1966) put it, one cannot develop a country by doubling the employees in administrative services or by “distributing sinecures”⁴⁸⁵ to one’s friends, as was the case when the principal author first arrived in Africa in the mid-1970s. René Dumont (1966) explained (see Section 11.2.2, Economic Viability of Sub-Saharan African Countries at Independence),

“we imposed an administrative structure on a backward economy that could not support the weight; and a trade structure which benefits industrial countries but blocks African growth”.

Dumont went on to say that the principle “industry” of these countries at the moment is administration, that is work in the government bureaucracies. Bureaucrats do not create wealth. They only spend money and thus cannot be the driving force of a country’s economy. Bureaucrats cost money and with little or no formal private sector or industries, currency strapped African governments fell into the trap of donor dependency and debt relief, which, in theory, structural adjustment (SAP) was to address through downsizing.

Downsizing government was a controversial move, since with a very small formal sector, most educated people in Sub-Saharan Africa were/are tied to government service and for every employee approximately 20-30 people in the extended family were dependent on a government salary (Rosenblum & Williamson, 1990). With no private sector to absorb these people, millions of individuals would potentially be without basic life support. A major problem is the sequencing of privatization so that as public retrenchments take place, there is an adequate private sector to absorb those laid off from the dismantling of state run institutions, be they bureaucracies or parastatals, otherwise there will be a major disruption of social and economic support (Alemayehu, 2000). The principal

⁴⁸⁵ Creation of salaried jobs of little substance or responsibility as part of a patronage system, as described in Chapter 11.

author remembers that in the 1980s, while working in Guinea-Conakry, the concern that his counterparts had on what such actions would do to social support networks potentially impacting a couple hundred thousand people, linked to the extended family.

With the loss of this support network afforded by the patronage system of the bureaucracy linked to the extended family, structural adjustment also required user fees for health care, education and basic social infrastructure. Many people could not afford these fees, resulting in a decline in the quality of basic services available to the average person, which we in the West take for granted. The immediate consequence of these changes was to weaken the already precarious situation of a very large number of Africans. Urban dwellers in particular, suffered high levels of unemployment and a serious fall in their standard of living, often leading to civil strife (Chabal & Daloz, 1999; Chomsky, 1999; Sogge, 2002; Stiglitz, 2002). The World Bank has shown that civil strife is systematically related to adverse economic factors, including unemployment resulting from excessive austerity; better to moderate inflation than violence and civil strife, resulting from unreasonable structural adjustment conditionalities (Stiglitz, 2002). It is clear that neo-liberal doctrines undermined education, health, increased inequality and reduced labor's share in income (Chabal & Daloz, 1999; Chomsky, 1999; Bond, 2002; Sogge, 2002; Stiglitz, 2002).

12.3.4.2 Structural adjustment and privatization of parastatals

A major shortcoming of structural adjustment is that it is based on government-to-government loans. Governments are not entrepreneurial by nature.

"The very nature of structural adjustment was itself contradictory: the adjustment reforms were to be implemented by the very state which was intended to be 'reduced.' Furthermore the reward for adjustment was renewal of financial aid to the state" (Chabal & Daloz, 1999), resulting in even more debt.

African politicians/elite spent this money with little impact on the economy. Many of the loans and foreign aid grants over the last 30 years have gone to fund government parastatals that were not dismantled and which are inefficient, wasteful by nature and are financial failures, putting the country further into debt and taking away from the basic services (e.g., health, education and roads) which is the role of the government to provide its citizens. Martin and O'Meara (1995) reported that between 1986 and 1992, only five countries had divested more than 40% of their parastatals and these five had the fewest parastatals of 100 or less. Countries with more than 200 parastatals, such as Kenya and Tanzania, had divested less than 10% of their public enterprises. Meredith (2004) discusses how 67% of IMF/World Bank loans between 1989 and 1991 went to parastatal reform with little oversight. African leaders sold off these government assets to political cronies and select businessmen at minimal prices on highly favorable terms, including low-interest loans and lengthy pay-off time in return for kickbacks.

Options for those retrenched could potentially be 1) Leave with compensation, 2) Continue with private sector owner or 3) Management employee buy-out (Alemayehu, 2000). In essence, option three is an employee-owned company in which all workers are shareholders, having not only experience in running the company, but also vested interests due to profit sharing in seeing the company grow and become successful. The worker gets this profit not the state, but the state collects income tax from the worker and the company (see declining terms of trade below for further discussion).

12.3.4.3 Structural adjustment and creation of government bourgeoisie

René Dumont (1966) believed the use of foreign aid to balance budgets relieved African governments from becoming economically mature and created a new bourgeoisie of the civil service “delinked” from the impoverished rural masses.

Very often, the IMF/World Bank loans were used to service interest rates on debt, instead of paying off the debt. These loans in turn, add to the national debt, since they have to be paid off and they have interest rates attached to them (Stiglitz, 2002). By the end of the 1980s, debt service accounted for 25% of exports of goods and services from Africa (Meredith, 2004). Thus, the developing world became caught in a downward spiral from which it could never escape. Government elites did not mind. In Swahili, these elite are called “*Wa-Benzis*” – literally in the eyes of local people, they have turned into a tribe, driving vehicles which they otherwise could never afford, taking free trips overseas and skimming loan/grant money, which is often not very well accounted for.

In many cases, IMF interventions have left countries just as impoverished, but with more debt and an even richer ruling elite (Stiglitz, 2002). Artificially balancing budgets also makes artificially high salaries possible and financial investment in urban construction, such as the villas of Dakar. The elite practiced what Chabal and Daloz (1999) call ‘politics of the mirror’, going through the motions of fulfilling World Bank, IMF and donor condition precedents, but with little actualization at the implementation stage. In turn, the elites redistributed much of the foreign aid to maintain their power through neo-patrimonial relationships. Structural adjustment was “Africanized” (Chabal & Daloz, 1999). Structural adjustment is akin to reorganizing a bankrupt company, along with a massive infusion of capital and then putting it back into the hands of the incompetent managers who ruined it in the first place (Guest, 2004).

12.3.4.4 Trade and structural adjustment policies (SAP)

Impacts of Currency Devaluation

Among SAP policies “is the stipulation that countries receiving Structural Adjustment Loans (SALs) must concentrate on increasing their exports so as to increase their income of ‘hard’ currency, needed for servicing their debts. The IMF priority here is to sort out BOP (Balance of Payments) deficits as fast as possible. For the majority of countries, particularly those on the African continent, this means increasing their production and exports of cash crops, raw materials for use in ‘developed countries’ industries” (Copeland, 2000).

“Another condition also designed to increase exports and bring more money into LDCs, is the devaluation of currencies. So as to make exports more attractive on the global market, countries receiving SALs (Structural Adjustment Loans) have had to devalue their currencies, something that was arguably necessary in many countries. However, currency devaluation in conjunction with liberalization, especially if we bear in mind that a large number of countries - all exporting the same crops - have been subject to these structural adjustments, has led to a marked drop in income to most ‘beneficiaries’ (Farmers, marketing boards/wholesalers and governments).

Thus, devaluing currencies automatically mean the exporting countries earn less. Furthermore, an obvious consequence of having a large number of, for example, coffee exporting countries all increasing their exports simultaneously, is for the market price to go down. This has indeed been the case whilst Sub-Saharan African countries doubled their exports over the 1980s, their share of world trade halved, from 4% to 2%” (Copeland, 2000).

The Commission for Africa (2005) places the drop in Africa’s share in world trade from 6% in 1980 to less than 2% in 2002.

Usually commodities [(unprocessed cotton, coffee, sugarcane, cocoa, bananas) and raw materials (oil, gold, diamonds, COLTAN (columbite-tantalite), platinum

and bauxite] are exported. Historically, this has been a partial reason for dependent economies and poor nations. To export commodities (which are cheap), to be denied industrial capital and real technology transfer and to, therefore, import finished products (which are more expensive due to the added labor to make a product from resources), nations that are primarily commodity exporters are likely to lose out as there would be little multiplier effect in their own economies. This was the role/rule enforced on former colonies under imperial or colonial rule (Shah, 2002; Hilary, 2002) and in recent times encouraged under structural adjustment.

Commodity Crisis

“The commodity crisis is the principal challenge to the achievement of economic and social development, and ecological sustainability in the majority of developing countries today...In 2001, real commodity prices for agricultural raw materials and minerals, ores and metals have fallen to 60% of their price levels in 1980” (Tan, 2002 *In:* Shah, 2002).

“In only seven years, the price of a tractor for Tanzania, measured by the export value of Tanzanian sisal, doubled. The relative value for rubber exporters dropped 300% between 1960 and 1975. Cotton exporters lost 60% of their buying power in the same time span. The prices of primary commodities that the developing countries export have collapsed to the same price as 21 years earlier while prices for manufactured products have soared, forcing the developing countries to export more and more while importing less and less” (Smith, 2001).

“The history of commodity price stabilization efforts and the collapse of commodity agreements is indicative of the vested interest of northern industrialized countries (under pressure from domestic corporate lobbies) to keep commodity prices at consistently low prices. It is also illustrative of the legacy of colonial economic relations between the north and south that continues today under the guise of structural adjustment programs and multilateral trade rules favoring developed countries. Inappropriate policy advice from International Finance Institutions (IFIs), notably the World Bank and

the IMF, and enforced through lending conditionalities have exacerbated the situation of overproduction” (Tan, 2002 *In:* Shah, 2002).

For instance, if many developing countries are encouraged to grow coffee, the global market becomes saturated and prices fall. If devaluation results in the costs to the producer going up because of increased costs of inputs, while he is paid the same or less, but his buying power decreases, to compensate he may produce even more to make up for the relative loss in buying power. This creates a saturated market and a cycle of declining prices, and can result in possibly mining and degrading soils, and even expanding into marginal areas for short-term gains where the needs for inputs are initially less (see Section 12.2.4.4, Cotton subsidies and protected markets).

Declining “Terms of Trade” Associated With Structural Adjustment

Therein lays the problem. Sub-Saharan Africa exports mostly raw products, whose value continues to decline, and then buys them back transformed for more than they paid for them, resulting in declining terms of trade⁴⁸⁶ (Commission for Africa, 2005).

On average in Africa, 78.6% of exports are primary products which contribute to 21.2% of the GDP, with resource rich African countries (e.g., especially those with minerals) having among the lowest quality of life rankings⁴⁸⁷ in the world (Commission for Africa, 2005). This latter issue will be discussed in some detail in Chapter 13.

⁴⁸⁶ Weighted average of a nation’s export prices relative to its import prices. Deteriorating “terms of trade” means the price of exports has decreased relative to the price of imports.

⁴⁸⁷ Human Development Index (HDI): “The UNDP ranks countries from 1 (highest) to 177 based on an aggregate of three indicators: life expectancy, education as measured by literacy and school enrolment rates, and standard of living as measured by per capita GDP and purchasing power” (Commission for Africa, 2005).

Combined with devaluated currencies where trade liberalization occurred, by taking away trade barriers and government subsidies, African producers were ill equipped to cope with increased competition from cheap foreign goods (Martin & O'Meara, 1995). This is “unequal” trade:

“At first glance it may seem that the growth in development of export goods such as coffee, cotton, sugar, and lumber, would be beneficial to the exporting country, since it brings in revenue. In fact, it represents a type of exploitation called unequal exchange. A country that exports raw or unprocessed materials may gain currency for their sale, but they lose it if they import processed goods. The reason is that processed goods -- goods that require additional labor -- are more costly. Thus a country that exports lumber but does not have the capacity to process it must then re-import it in the form of finished lumber products, at a cost that is greater than the price it received for the raw product. The country that processes the materials gets the added revenue contributed by its laborers” (Shah, 2002).

“Reliance on just a few commodities makes countries even more vulnerable to global market conditions and other political and economic influences. More than 50 developing countries depend on three or fewer commodities (raw products) for over half of their export earnings. Twenty countries are dependent on commodities for over 90% of their total foreign exchange earnings, says the World Bank” (Shah, 2002).

“Falling [commodity] prices have meant that large increases in export volume by commodity producers have not translated into greater export revenues, leading to severely declining ‘terms of trade’ for many commodity producing countries. When the purchasing power⁴⁸⁸ of a country's exports declines, a country is unable to purchase imported goods and services necessary for its sustenance, as well as generating income for the implementation of sustainable development programs. A vast majority of developing countries depend on commodities as a main source of revenue. Primary commodities account for about half of the export revenues

⁴⁸⁸ Purchasing power of money is measured by the quantity and quality of products and services it can buy, also called buying power.

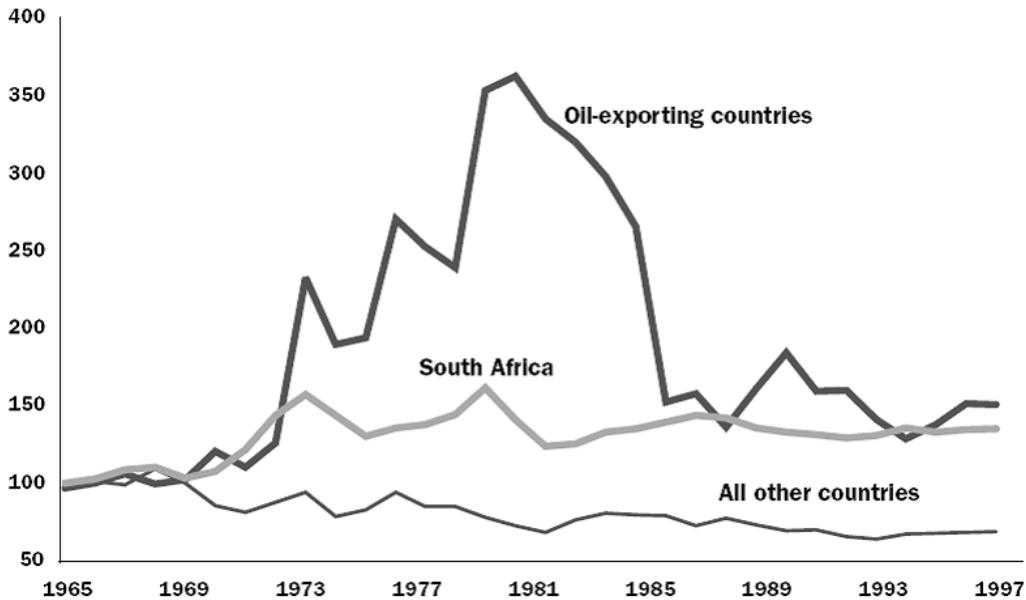
of developing countries and many developing countries continue to rely heavily on one or two primary commodities for the bulk of their export earnings" (Shah, 2002).

After a decade of structural adjustment reforms, little progress has been made in either reducing African economies' foreign debts or in expanding and diversifying their productive capacities, let alone improving the living standards of the vast majority of the people. The World Bank found that in adjusting countries, between 1981-86 and 1987-91, the annual rate of economic growth⁴⁸⁹ increased for half, but declined for half. Generous flows of "external aid" for adjusting countries accounts for any positive results, while deteriorating "terms of trade" for exports – mostly of raw products – accounts for the decline in economic growth (Martin & O'Meara, 1995) (Figure 12.1).

For example, according to the International Coffee Organization (ICO), the free on board (f.o.b.) value of coffee dropped from US\$ 10-12 billion in the early 1990s to US\$ 5.5 billion today. This affected the livelihoods of 125 million people in the developing world, while retail sales, mostly in the West, jumped from US\$ 30 to 70 billion in the same time frame. Without an Organization of the Petroleum Exporting Countries (OPEC) for coffee and other raw commodities to control availability and negotiate prices, producing more only gets Sub-Saharan Africa and the rest of the developing world less (Kousari, 2004).

⁴⁸⁹ Economic growth is the annual percentage rate change (from year to year) in a nation's "real" (adjusted to remove the effects of inflation) gross domestic product (real GDP)

Index: 1965 = 100



Source: World Bank (2000) with permission, World Bank.

Figure 12.1: Sub-Saharan Africa's "Terms of Trade" by country group, 1965-1997

Colgan (2002) concluded that “During the 1980s, when most African countries came under World Bank and IMF tutelage, per capita income declined by 25% in most of Sub-Saharan Africa. The removal of food and agricultural subsidies caused prices to rise and created increased food insecurity”.

“Left to its own devices, the market will not bring about serious economic growth in Africa: indeed, open the borders and the export of primary products have not led to sustained development anywhere in the world” (Chabal & Daloz, 1999).

“In response to poor economic performance and insecurity, there has been substantial capital flight, together with unmanageable external debt over-hang, which currently is equal to 80% of Africa’s GDP” (Mule, 2003).

The net result of SAP policies in Sub-Saharan Africa was a major decline in GDP. Between 1960 and 1980, per capita GDP increased by 36%, while between 1980 and 1998, during the period of structural adjustment (free-market

fundamentalism), the per capita GDP fell by 15% in SSA, showing SAP policies to be bogus (Sogge, 2002). Zack-Williams (2002 *In: Zack-Williams, et al., 2002*) estimates that Sub-Saharan Africa's per capita GDP fell from US\$ 671 in 1975 to US\$ 245 by 1997. This “shock therapy” resulted in income inequalities with redistribution of wealth upwards, heightening the gap between the poor and the rich elite, along with cuts in social services. The winners were the industrialists and the upper 10-20% income bracket, while the losers were the bottom 80% on the socio-economic scale – the uneducated impoverished masses (Sogge, 2002). UNECA (2004) estimates for African countries, which are not oil exporters, the cumulative terms of trade losses in 1970-97, represented almost 120% of GDP, a massive and persistent drain of purchasing power.

Trade Agreements Linked to SAP, to the Benefit of Whom?

“When the universal result is low resource export prices and increased poverty, the IMF/World Bank/GATT/NAFTA/WTO/MAI/military colossus can hardly claim their intent was to develop those countries. Just as the proto-mercantilist cities of the Middle Ages controlled the countryside’s production and trade to lay claim to their wealth, mercantilist and neo-mercantilist empires claimed the wealth of their colonies (their countryside), the developing countries are today the ‘dependent countryside’ producing cheap resources for emerging corporate mercantilists” (Smith, 2001).

Transnational Corporations (TNCs) from the world's richest countries, which control both the World Bank and IMF, profit from the steady supply of cheap commodities and the investment opportunities that SAPs guarantee. Privatization of state enterprises, a central theme in structural adjustment, has allowed TNCs to expand their activities across the south, just as public sector redundancies have provided a ready pool of unemployed people desperate for work at any rates (Hilary, 2002).

In southern Africa, TNCs market the food and control our food systems. Altria, the Philip Morris group of companies, which includes Kraft and Miller, made over US\$ 8 billion in profits last year (Fortune Magazine Online, 2002 *In: Patel & Delwiche, 2002*). In the past six months, Switzerland-based Nestlé S.A. posted profits of a little under US\$ 4 billion on sales of US\$ 29 billion (Nestlé S.A., 2002 *In: Patel & Delwiche, 2002*). To put this in perspective, the entire gross domestic product for all six countries in the famine region was a little over US\$ 20 billion in 2001 (World Bank, 1999 *In: Patel & Delwiche, 2002*). These corporations depend on cheap inputs (e.g., cocoa), such as the agricultural products grown in the Third World, to make their food processing profitable. Cheap labor and lower environmental standards in developing countries add to these profits.

NAFTA Free-Trade Agreement, a Benefit to Whom – Lessons for Africa

The North American Free-Trade Agreement (NAFTA) has transformed Mexico into a cheap source of manufactured goods, with wages 10% (1/10th) of the U.S. The decrease in wages was hailed as an inducement to foreign investment, along with labor repression and lax enforcement of environmental restrictions. “Free-trade agreements” extend control over the global economy to the benefit of a few, while impoverishing the masses (Chomsky, 1999). NAFTA is exactly what AGOA and NEPAD, (to be discussed in the next chapter) should not be – another way of maximizing profits at the expense of the worker and the environment. Yet America wonders why illegal aliens are flocking across its borders, in turn providing cheap illegal farm, construction and other manual labor that the middleclass will no longer undertake – thus benefiting the private sector on both sides of the border. In essence, another form of subsidy – cheap labor and no environmental controls – has been brought about by intervention of the U.S. Government on the behalf of the American private sector, resulting in good capitalism – a maximization of the profits, regardless of the consequences to

people or the environment. Attempts are being made to deal with environmental issues (see Chapter 13, Section 13.13.4, NAFTA, Maquiladora and the Environment, Lessons for Sub-Saharan Africa)

Meanwhile, NAFTA has been used to subordinate workers in America, with actual or threatened exports of jobs overseas, when increased salaries or worker benefits are demanded. Real wages have fallen since the 1960s for production and non-supervisory workers, and concern exists that “free-trade” deals like NAFTA, will harm not only local workers, but lock the United States into a low-wage, low-productivity, high profit (for the corporate elite) future, with increasing polarization between the rich and poor, with possible social disintegration (Chomsky, 1999). Africa beware!

12.4 STRUCTURAL ADJUSTMENT FOOD PRODUCTION AND LAND/RESOURCE DEGRADATION IN SUB-SAHARAN AFRICA

Hypocritical structural adjustment policies, often a prerequisite to foreign aid, have forced African countries to cut agricultural subsidies (McCann, 1999), as well as support to agricultural research and extension services (Mule, 2003; Roman, 2003). Meanwhile, these subsidies continue in America and Europe, providing a comparative advantage for Western farmers over African farmers. This will also be discussed in greater detail in Section 12.4.1.1, Structural adjustment and agriculture.

At the beginning of the 1980s, African states had a very clear idea of what their economies and societies needed in order to flourish. In the Lagos Plan of Action (OAU, 1981 *In:* Patel & Delwiche, 2002), Heads of State called for a type of economic growth disconnected from the ever-changing world market, relying on import-substitution policies, food sovereignty and trade within Africa and,

critically, a reduction in the level of external indebtedness that was systematically siphoning value out of Africa.

The World Bank disagreed, insisting in its Berg Report (World Bank, 1981 *In: Patel & Delwiche, 2002*) that State interference in the smooth functioning of the market was precisely the cause of low levels of growth (Arrighi, 2002), even though America and Europe were, and are, doing just that (e.g., subsidizing farmers, protecting fragile markets with trade tariffs and setting import quotas), while purporting to support “free-trade”. As most African governments were buried in debt, their futures mortgaged on declining commodity prices, the Bank’s plan prevailed (Danaher & Riak, 1995). Under the Bank’s regime, African nations were forced to produce foreign exchange-earning (i.e., cash crops) to pay off increasing debt and found themselves importing more and more food. In a perfect, stable market, this would not pose a problem: the farmer would grow an export crop in which she or he has a comparative advantage and will use the cash to buy imported food, goods and services. In the real world, however, this model increases farming communities’ vulnerability to a number of risks (Patel & Delwiche, 2002):

- **Commodity Price Fluctuations and Decline:** Primary commodity prices have been falling consistently for 30 years. In part, the World Bank is to blame; its structural adjustment programs enforced the export of a few key commodities, “in the raw” in high demand in the North, putting southern countries on the receiving end of volatile and decreasing prices for their exports (Peters, 2000 *In: Patel & Delwiche, 2002*).
- **Currency Fluctuations:** Even the most efficient farmers are unable to buy food on the world market if their currency is undervalued. Yet this is what every economic model suggests will happen when countries follow World

Bank recommendations to liberalize exchange markets (Greenhill & Pettifor, 2002 *In: Patel & Delwiche, 2002*).

12.4.1 Impacts of Structural Adjustment on Sub-Saharan Africa's Natural Resources

12.4.1.1 Structural adjustment and agriculture

The Bank's prescriptive approach focused solely on domestic policies targeting agricultural policies, macro-economic policies and the government's role in the economy. The rejuvenation of the agricultural sector was a core concern of structural adjustment programs, especially price reforms, which attempted to stop the underpayment of African farmers by coffee, maize and other "control boards", or by keeping prices artificially low in order to keep the urban masses happy, their primary supporters. Structural adjustment programs mandated abolishing price controls through government agricultural marketing boards and liberalizing exchange rates in order to allow farmers to earn a larger share of world prices for their exports. Governments were also required to improve roads and extension services (neither possible under SAP) and to reduce interference in seed and fertilizer markets, as well as in credit schemes (Martin & O'Meara, 1995). It was assumed that higher prices and lower taxation of the farmer would stimulate production.

It would appear that this was based primarily on economic considerations, with little regard for structural limitations. Limitations on agricultural production in Africa include physical and chemical limitations of the soils (see Chapter 5, Section 5.5, LAND USE POTENTIAL AND CONSTRAINTS IN SUB-SAHARAN AFRICA). This is especially true in the savanna lands, where a majority of the people live and which are not conducive to permanent commercial

agriculture. These lands experience low rainfall, exhibit poor physical and chemical characteristics, have declining land available/person to cultivate, an uneducated poorly nourished populace, and often very repressive climates and disease, unlike more temperate climate zones; in addition to inadequate market infrastructure, such as roads and storage facilities and in general, the already stressed ecosystems on which an over-populated continent was trying to farm (see Chapter 5) (Martin & O'Meara, 1995). Thus, the declining “terms of trade” for primary products and ecological constraints on much of Africa's soils make great strides in agricultural production questionable (see Section, 12.3.4.4, Trade and structural adjustment policies [SAP], Declining “Terms Of Trade” Associated With Structural Adjustment). The biggest strides are likely to be made in developing industries in Sub-Saharan Africa that transform these products prior to export and for local/regional consumption, as opposed to exporting them raw and having to buy them back transformed.

SAP policies have also resulted in the best agricultural land being used for the growing cash crops to raise hard currency to service unpayable debts, while farmers trying to grow food crops are often left with land virtually unfit for agriculture, or they chose the best land for cash crops and apply inputs, while choosing marginal land for agriculture, using little or no inputs with the strong risk of nutrient mining and soil degradation (ANON, 1998; Copeland, 2000). Madeley (2002) raises concern that structural adjustment policies (SAPs) which encourage production of export crops by small farmers, convert the best land, formerly in food production, into commercial crops. Food production then takes place on the more marginal lands, thus risking to increase food insecurity, and increasing mal- under-nutrition as money from commercial crops is often used for things other than food, such as school fees and health care, since SAPs eliminated these government sponsored programs. SAPs, which push increased production on a global level, also result in declining commodity prices and thus, do not mean that the farmer's income will necessarily increase significantly even though his

production increases (see Section 12.1.2, Today, Raw Products Continue Flowing and 12.2.5, ILO Demands an End to Subsidies and Trade Barriers). As an example, about 70% of coffee growers are small-scale farmers globally. In 2001, the world price of coffee reached its lowest price in 30 years, well below the cost of production (Madeley, 2002).

At the same time, SAP requirements to liberalize their economy and open their markets allow the USA and EU, with a glut of agricultural produce, to find needy markets in Sub-Saharan Africa and the rest of the developing world for this produce where it is sold below the normal prices. This undercuts local small farmers who, unable to compete with the agro-industry of the U.S. and EU, are forced out of business (ANON, 1998; Copeland, 2000). This would be fine if the cash crops were transformed in Africa, but they are generally exported raw and the consequences, as described, make commodity dependent countries vulnerable to market flooding and decreased prices, for both local and export commodities.

12.4.2 Structural Adjustment, a Disincentive to Sustainable Resource Management

“Serious environmental destruction began in many Third World countries in the 1970s and 1980s. Easy money was available from industrialized countries for ‘development’. Much of it was spent on large dam projects (see Chapter 7), power plants and charcoal driven industries. These usually didn’t help the poor, and did damage the environment” (Jubilee Plus, 2002).

“IMF and Bank-supported adjustment policies have been among the major contributors to environmental destruction in the Third World. By pushing countries to increase their foreign exchange to service their foreign debt, structural adjustment programs have forced them to super-exploit their exportable resources” (Bello & Cunningham, 1994),

milking the earth's resources for the hard cash they brought in, while cutting back on environmental conservation programs (Jubilee Plus, 2002). The “export-led growth” model on which the IMF and the World Bank insist, is a purely extractive one, involving more the “mining” than the management - much less the conservation - of resources (e.g., timber, mining, fishing, soils) (Bello & Cunningham, 1994; Welch, 2001; Smith, 2001). In other words,

“Depressed commodity prices have meant that many countries dependent on primary exports have been forced to increase production in attempts to compensate for falling prices. This has led to a situation of more land resources being used for export crop production, reducing land available for domestic food cultivation, and increasing deforestation of non-agricultural land” (Tan, 2002),

undermining peasant agriculture, while reinforcing export-oriented agribusiness and its dependence on dangerous agrochemicals if used improperly (Bello & Cunningham, 1994; Welch, 2001). The net result has been:

- Allowing over-fishing of their waters so that fish stocks are damaged and local fishing economies and cultures are often degraded (see Chapter 4);
- Allowing multinational companies logging rights to their forests, destroying the lifestyle of those who live there (see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas); and
- Chopping down forests to make room for beef cattle grazing or crop farming (see Chapter 5, Sections, 5.9.4, Forest Losses Linked to Over-Population and Commercial Agricultural and Land Scarcity).

As noted under Section 12.2.4.4 (Cotton subsidies and protected markets, U.S. Cotton Subsidies and Africa, Cultivating Poverty), one potential consequence of getting less for producing more is soil mining, and misuse of fertilizers and pesticides to get more out of the ground. This may even result in expanding

production onto more land, even marginal lands; often into key wildlife or livestock habitat in savannas, as a means of increasing overall yields. The net result of declining economies linked to structural adjustment has also been an increase in poaching, as the unemployed return from the cities to their rural roots and/or rural people begin searching for alternative incomes to supplement that lost from devaluating currencies, loss of government support, etc. linked to structural adjustment. Examples of such activities are contained in:

- Chapter 5, Section 5.12.1.2, Green revolution technologies, Green Revolution, Zimbabwe;
- Chapter 9, Section 9.7.2, Reluctance to Devolve Control and Ownership of Resources to Landholders;
- Chapter 9, Section 9.7.8.3, Need for non-rural livelihood alternatives through industrialization;
- Chapter 9, Section 9.8.4, Devolution and CAMPFIRE, Zimbabwe;
- Chapter 10, Section 10.3.2.3, Politics of despair;
- Chapter 10, Section 10.5, RHINO, TRADE OR TRADE CONTROL, WHAT'S BEST FOR CONSERVATION;
- Chapter 11, Section 11.11.6.2, Modern conservation and the Baka Pygmy
- Section 12.4.3.2, Impacts of structural adjustment on fertilizer use and intensification in Senegal's groundnut basin;
- Section 12.4.3.3, Impacts of structural adjustment on maize production and fertilizer use in Zambia and Zimbabwe;
- Section, 12.4.4.2 Impacts of structural adjustment on Central Ghana cash crop economies, fallow and virgin forests;
- Section, 12.4.4.3, Impacts of structural adjustment on sustainable rice production in Madagascar;
- Section, 12.4.4.4, Impacts of structural adjustment on land hunger in Zimbabwe; and

- Section 12.7.1.12, Impacts of structural adjustment on the wildlife and parks estate in Zimbabwe

12.4.3 Declining Fertilizer Use in Sub-Saharan Africa

The Green Revolution, through a combination of high yielding wheat and rice, fertilizer and irrigation, resulted in a doubling of yields/ha in the Far East. However, lack of an economically enabling environment in Sub-Saharan Africa constrained a take-off of enhanced fertilizer use, even though on-farm trials demonstrated similar results as in Asia; the increased yield (kg)/ha/kg of nutrients added being 8 kg/ha for cereals and up to 30 kg/ha for root and tuber crops in parts of Sub-Saharan Africa. However, while global consumption of fertilizer grew from 31 million tons in 1961 to 135 million tons in 1997, averaging 90 kg/ha of cropped land, Sub-Saharan Africa averaged only 9-10 kg fertilizer/ha of arable land (Winterbottom & Neme, 1997; Reardon, Barrett, Kelly & Savadogo, 1999; Gruhn, Goletti & Yudelman, 2000; Dudal, 2002 *In:* Vanlauwe, Diels, Singinga & Merckx, 2002; NEPAD, 2002) and many do not have either access to fertilizer stocks or cash/credit to purchase fertilizers (Winterbottom & Neme, 1997). FAO (2002) estimates that small farmers in SSA applied five kg/ha/year of fertilizer. Similarly, NEPAD (2002) estimates that fertilizer use in all of Africa as a whole, is only 21 kg (nutrients)/ha of arable land/year, and only 9 kg/ha arable land in Sub-Saharan Africa. Outside Africa, as much as 75% of crop-yield increases world-wide since the mid-1960s are directly or indirectly attributable to fertilizer use (Reardon, *et al.*, 1999).

By comparison, global fertilizer use in the rest of the World reached approximately optimal management levels (Gruhn, *et al.*, 2000; NEPAD, 2002). In 1997, an average of 206 kg/ha of fertilizers were used in industrialized countries, 80 kg/ha in the Near East and North Africa, 73 kg/ha in Latin America,

79 kg/ha in South Asia and 147 kg/ha in East Asia. The 9 kg/ha reflects large extensive areas in Africa using no fertilizer, with intensively managed commercial areas using the most fertilizer. The net result has been nutrient mining and a declining per capita food production in Sub-Saharan Africa (Dudal, 2002 *In: Vanlauwe, et al., 2002*).

“The use of chemical fertilizers in Sub-Saharan Africa has hovered at only 2 million metric tons (per year) since 1980. Most of the fertilizer is used in only four countries: South Africa (832,000 tons), Nigeria (394,000), Zimbabwe (171,000) and Kenya (134,000). Application rates are among the highest in Mauritius (261 kg/ha of arable land), Zimbabwe (60 kg/ha) and Kenya (48 kg/ha). The only other SSA countries with significant rates of use of fertilizer are Togo, Malawi, Tanzania, Lesotho, Nigeria, Congo and Cote d’Ivoire — generally coastal countries or with a concentration of high-input farming for export markets” (Winterbottom & Neme, 1997).

In many cases, on the marginal agricultural lands constituting approximately 70% of SSA (see Chapter 5, Section 5.5.1, Land Use Potential for Rainfed Agriculture in Africa), the cost of inputs such as commercial fertilizer versus increases in yields, may not be cost-effective. As marginal land that is already low in productivity becomes degraded, it is cheaper to bring additional land into production rather than invest in maintaining or improving the long-term productivity of cultivated land. This is not necessarily a bad land use practice, particularly if the cropland is simply being abandoned temporarily and left fallow until its productivity is restored, as discussed in Chapter 2. However, as discussed in Chapter 5, fallow periods are disappearing across the continent and soils are rapidly degrading. In simple terms, there may not be any easy high tech solutions to these marginal areas, under high human population pressure, to produce, that worked well under traditional management when under low human populations.

It is believed that until the 1960s, more than adequate land was available for fallow agriculture, allowing any expansion in agricultural production to occur through opening up new land, which was cheaper for the farmer than purchasing fertilizers. This resulted in an expansion from 120 to 154 million hectares (34 million hectares converted) in arable land between 1961 and 1997 in Sub-Saharan Africa, a 28% increase in land conversion (Dudal, 2002 *In: Vanlauwe, et al.*, 2002). Gruhn, *et al.* (2000) estimate an increase of 14 million hectares of land converted in Sub-Saharan Africa to agriculture from 1973-1988.

This level of expansion can no longer continue without jeopardizing many of Africa's unique natural areas and without going into areas where other environmental constraints inhibit production (e.g. soil moisture, soil structure, soil depth, acidity, alkalinity, etc.). The only hope for increasing food production will be through various ways of increasing soil fertility, optimizing the use of the most productive lands and possibly using improved seed varieties (see Chapter 5, Section 5.12.1, Technological Solutions to Africa Food Crisis and Land Degradation).

“FAO estimates show that between 1995/7 and 2030 about 75% of the projected growth in crop production in Sub-Saharan Africa will come from intensification in the form of yield increases (62%) and higher cropping intensities (13%), with the remaining 25% coming from arable land expansion” (NEPAD, 2002).

In other words, if Sub-Saharan Africa does not move towards achieving the FAO scenario, it will be in trouble as a result of increasingly poor crop yields, degraded soils, encroachment on important natural systems and increasing dependency on food aid that may not be forthcoming if global grain deficits continue (see Chapter 5, Section 5.3.1.2, Keeping up with future demand – global deficits of the 21st century). FAO (2002) is concerned that by 2020-2030, climate change could depress cereal production in Africa by 2-3%, affecting 10 million people.

Intensification, using improved seeds and increased fertilizer use, will be needed to compensate.

Land tenure, positive cost/benefit ratios of yield to fertilizer input, product price, access to markets (e.g., infrastructure) to sell surpluses and credit are other incentives farmers will need to induce them to adopt fertilizers and other techniques. Also, farmers need to be sensitized to the inter-generational benefits of maintaining soil fertility, even though short-term gains can be obtained from nutrient mining (Dudal, 2002 *In: Vanlauwe, et al., 2002*).

However, in much of Africa input intensive technologies are not economical when farmers must pay three to five times the world market price for their fertilizer and receive only 30 to 60% of the market value for their products (Hazell, 2001) (see Chapter 5, Section 5.12.1, Technological Solutions to Africa Food Crisis and Land Degradation).

Regardless of the type of crop produced and despite the cost of fertilizer, three factors appear to be key in determining whether farmers use commercial fertilizers. First, fertilizers should help farmers obtain sufficiently high yields. Second, farmers should be near major towns, where agricultural input distributors are located, in order to benefit from lower prices for inputs and higher prices and lower marketing costs for outputs. Third, farmers should be able to store at least part of their output, so that they can take advantage of higher out-of-season prices (Donovan & Casey, 1998 *In: Gruhn, et al., 2000*). When these three factors are in place, farmers are more willing and able to use fertilizer to increase income and sustain soils for the long term (Gruhn, *et al.*, 2000). Thus, very often the cost of inputs cannot be justified compared to the increase in crop yield, given local and world market prices and/or the risks of drought, locusts and other pests/factors significantly reducing his/her yield. Often, the small farmer risks going further into debt from using these inputs.

Additionally, fertilizers alone cannot maintain the soil productivity and if continuous cultivation is to be adopted, then new ways of maintaining soil organic matter must be found if the fallow is to be reduced or abandoned and accelerated erosion is to be checked (de Vos, 1975). Potential solutions to intensification are discussed in Chapter 5, Section 5.12, THE WAY FORWARD.

12.4.3.1 Impacts of structural adjustment on fertilizer use

Structural adjustment policies (SAPs), including declining subsidies for fertilizers and pesticides, are a major constraint to declining application of these inputs in Sub-Saharan Africa. Likewise, increasing interest rates, as part of structural adjustment, has made it difficult for small farmers to find affordable credit to purchase inputs (e.g., fertilizer, pesticides and seeds) (Stiglitz, 2002). Other SAP policies, such as currency devaluation and encouraging mono-culture export economies of raw products, resulting in market flooding and commodity price declines, make it often difficult and unaffordable for small farmers to purchase fertilizers.

Nitrogen-to-maize price ratios in Ghana, Tanzania and Zambia were substantially higher during the 1990s, after the SAPs were instituted, than during the 1980s, when price controls and subsidies were in effect (Heiney & Mwangi, 1997 *In: Gruhn, et al.*, 2000). The SAPs and higher input prices have consequently reduced the profitability of using fertilizer to increase the production of food grains for domestic consumption (Gruhn, *et al.*, 2000).

Farmers growing export crops have however, benefited from the restructuring of currencies, and increased their fertilizer use (Gruhn, *et al.*, 2000). Only profitable, commercial farms (even if small-scale and of food or nonfood products) induce investment by African farmers in inorganic fertilizer use, animal traction, organic matter use and soil conservation investments (Reardon, *et al.*, 1999):

- **In Burkina Faso**, farmers use 13 times more manure on cotton and maize, both cash crops, than on sorghum and millet, the main subsistence food grains;
- **In Zimbabwe**, farmers mainly use improved tillage practices and fertilizers where there are profitable cash crops;
- **In Northern Ghana**, fertilizer use is low on average and very variable over farms, but tends to be applied only to crops-for-sale (hybrid maize, cotton and rice) and not on subsistence-food crops such as sorghum, millet and cowpea; and
- **In the highlands of Tanzania and Rwanda**, farmers confine fertilizer and soil conservation practices to cash crops.

However, given the vast acreage devoted to subsistence food crops compared with the modest area under export and/or cash crops, the devaluation of currencies and the reduction of fertilizer subsidies on balance have been detrimental to increased application of imported fertilizers (Gruhn, *et al.*, 2000). Since commercially viable land makes up only about 7-11% of the African continent, maybe 27% of SSA, much of this being constrained by over-population or other land use priorities (e.g., dispersal areas for wildlife), there are few areas in SSA that can support these expensive inputs without subsidies, which most African countries cannot afford and which many macro-economic policies dissuade.

12.4.3.2 Impacts of structural adjustment on fertilizer use and intensification in Senegal's groundnut basin

Seed, fertilizer, credit subsidies and animal traction equipment programs greatly reduced input and equipment costs to peanut farmers in the Senegalese Peanut Basin from the 1960s to the early 1980s, prior to structural adjustment (Kelly, Diagana, Reardon, Gaye & Crawford, 1996; Reardon, *et al.*, 1999). Under this *Program Agricole*, fertilizers were subsidized from 40-60% (Kelly, *et al.*, 1996). This fostered sustainable intensification as input use/ha climbed sharply in the production of peanuts sold as a cash crop in a guaranteed export market (Reardon, *et al.*, 1999).

“Production increased from 892,000 tons in 1960/61 to 1,168,000 tons in 1965/66, and marketed peanuts went from 786,000 tons to 1,089,000 tons - meeting the established target of increasing output by 25%. Much of the gain was through increased planting (1,114,000 ha in 1965 versus 977,000 ha in 1960), but increased productivity per hectare was also evident (1,007 kg/ha in 1965 versus 913 kg/ha in 1960)...Although Senegal's fertilizer consumption rate was one of the highest in Africa in the mid-1970s, it represented an average application of only 11 kg/ha” (Kelly, *et al.*, 1996).

However, as a policy pursued since colonialism, little emphasis was placed on increasing cereal production, with deficits being made up by imports of rice from Asia. Thus, farmers grew cereals for personal consumption, and with little or no market/marketing saw little value in wasting fertilizers. Kelly, *et al.* (1996) state that

“aggregate millet production increased steadily from 392,000 tons in 1960/61 to 514,000 tons in 1964/65. This increase was due to expansion of the area cultivated, as yields/ha declined from 574 kilograms in 1960/61 to 508 kilograms in 1964/65”.

Liberalization (Structural Adjustment) brought the removal of those government subsidies and guarantees. This led to a relative de-intensification of peanut production and a precipitous decline in inorganic fertilizer use. This is a response, in part, to decreases in expected profitability of improved input use, due to changes in subsidy and financial services policies in the 1980s. It also reflects a risky and deteriorating physical environment, the result of low and variable rainfall, plus decades of continuous peanut/millet cultivation with limited use of fallow, organic matter and chemical fertilizers (Reardon, *et al.*, 1999).

“Fertilizer use dropped from 74 to 44 thousand metric tons between 1980/81 and 1981/82. Precipitous drops continued to occur throughout the 1980s. A reduction in the fertilizer subsidy almost doubled the farm-gate fertilizer price between 1982 and 1983, further exacerbating the problem. Use fell from 41,000 to 27,000 tons between 1984 and 1985, when the government imposed a *retenue* system, taxing farmers when they marketed peanuts to pay for fertilizer that would be delivered for the following season” (Kelly, *et al.*, 1996).

Following the sharp drop in fertilizer consumption during the 1980s, farmers began increasing peanut seeding densities to improve yields and incomes, at least in the short-term, and to compensate for the declining soil quality that they believed was slowing down the growth of peanut ground cover and, therefore, causing weed problems. Survey data show that many farmers are using more than twice the recommended quantity of seed/ha. Although raising peanut seed density appears to be a logical short-term solution, agronomic research suggests that it is not a sustainable practice. Without supplementary fertilizer and organic matter, increased seeding densities not only lead to further soil mining, but also undermine seed quality over time (Reardon, *et al.*, 1999).

Diagana and Kelly (1996) found that peanut production was the most profitable way to use agricultural land and labor in the Groundnut Basin of Senegal, after the currency devaluation (50/1 to 100/1 CFA/French Franc) as a result of structural adjustment. Households would pursue peanut mono-cropping were it not for food security and land rotation constraints – the need to maintain 50% of their land in millet for food security, rotating with nitrogen fixing peanuts. Soil degradation was projected to continue and perhaps accelerate due to the increased profitability of peanuts because chemical fertilizers are not economically competitive with the soil-mining practices of increasing seeding densities. Thus, although the devaluation increased gross margins and nominal income in the short-run, it also increased the negative impact of agriculture on the environment by encouraging farmers to raise peanut production without adopting technologies that would return nutrients to the soil, guard against soil erosion and improve the quality of their seed stock.

12.4.3.3 Impacts of structural adjustment on maize production and fertilizer use in Zimbabwe

At independence in 1980, Zimbabwe inherited a dual agrarian structure of 6,500 commercial “white” farmers producing 90% of the maize and cotton and 99% of the tobacco, while 700,000 smallholders produced the remainder (Eicher, 1990 *In: Eicher & Staatz, 1990*).

Before the structural adjustment programs of the second half of the 1980s and the first half of the 1990s, governments had developed rural feeder roads and depots to provide reliable market access, subsidized farm credit programs, subsidized fertilizer and seed inputs, and expanded extension services to smallholders - conditions that in the early 1980s, provided the incentive and capacity for smallholders to adopt long-available hybrid maize varieties. It is important to

note that it took 28 years of research in Zimbabwe to develop a hybrid variety of maize (SR-52) for commercial farmers in 1960 and to develop shorter season (110-120 day) hybrid varieties for smallholders in the 1970s (Eicher, 1990 *In: Eicher & Staatz, 1990*). By 1990, all commercial farmers, as well as 80% of the smallholders, used plant hybrids, the highest percentage in Africa (Eicher, 1990 *In: Eicher & Staatz, 1990*).

This technology was essential to “sustainable agriculture intensification” among smallholders in the most environmentally fragile areas of the country and there was a boom, a local Green Revolution. However, Zimbabwe could not afford the public expenditures demanded by depot provision and subsidies for seed, fertilizer and financial services, and under pressure from International Finance Institutions (IFIs) concerned about fiscal deficits, the system was dismantled in the second half of the 1980s and early 1990s.

From 1979-1985, Zimbabwean smallholders were producing 30% of the marketed surplus maize (tripling their maize production), up from 10% in 1980. They sold 60% of this increase in maize output. However, 70% of this increase came from only 10% of the smallholders who had the best watered land in high rainfall areas (Eicher, 1990 *In: Eicher & Staatz, 1990*).

Since structural adjustment, smallholders have shifted away from fertilizer use on maize toward “labor-led” intensification that threatens soil fertility.

12.4.4 Impacts of Structural Adjustment on Peasant Production Systems

12.4.4.1 Impacts of structural adjustment on peasant farmers along the Senegal River

Under the second phase of Senegal's structural adjustment program linked to the *Nouveau Politique Agricole* (New Agricultural Policy), what at first appeared in the interest of the small farmer, turned out to support a private sector of local politicians and civil servants through SAED (*Société d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal*), the body that controlled the construction of irrigated perimeters along the Senegal River. Between 1987 and 1992, 20,000 hectares were put into operation in the Delta, the most successful schemes going to SAED cadres with access to land and financial support. However, due to many factors, especially soil salinization from hastily built and ill conceived perimeters and the cost of pumped irrigation versus the lower cost of imported rice, loan repayments decreased between 1990 and 1993. At first people decreased the area under irrigation and then started giving up all together. USAID consultants tried to make entrepreneurial farmers out of cinema owners, etc. instead of working with small farmers. This failed and not one hectare was irrigated. Small farmers, through their federation, sought funding to rehabilitate irrigation perimeters. Structural adjustment resulted in the loss of any agricultural subsidies. Farmers reduced inputs at the cost of lower yields, emigrated in search of work, or took cash advances from wealthier people. In essence, they became share-croppers, allowing outsiders to invest in irrigation without having been granted land. In the end, many sold their land or simply walked away. The State could no longer play the role of the private sector and yet the small farmer, who should have played an important role, did not count (Adams, 2000) (see Chapter 5, Section 5.12.1.3, Irrigation potential, Major

Constraints to Irrigation as an Alternative to Production and Chapter 7, Section 7.10.5.1, Senegal River).

In fact, because of declining food production, as a result of the slow pace of irrigation expansion and the rarity of useful floods since the Manantali and Diama dams were finished a decade ago, there has been an out migration by young males. In addition, households depend on remittances to buy food they no longer produce, there is an increase in malnutrition, especially among women, children and ethnic minorities, and increased vulnerability to respiratory and parasitic diseases from declining nutrition (Finger & Teodoru, 2003).

René Dumont (1966) described tenant farming as inhumane exploitation. Because of the poor profit margin to the tenant, the majority of profits often go to absentee elite living in the city. Thus, there is little or no incentive to reinvest capital back into the necessary infrastructure and technologies (e.g., soil conservation, fertilizers, & drainage) to maintain the productivity of the land, which is thus mined for short-term benefits by the impoverished tenant farmer. René Dumont (1966) considered programs like SAED as a “crime against the nation”.

12.4.4.2 Impacts of structural adjustment on Central Ghana cash crop economies, fallow and virgin forests

“In the future, the need for forest biodiversity conservation will stem not from human action of the past but from the imperatives of the world economy of development in the present” (McCann, 1999).

From 1880 to 1920, Central Ghana entered into the global economy, first supplying palm oil by taking wild seeds and creating plantations and once this market was saturated, producing cocoa. Cocoa linked small farmers into the global cash economy. The addition of tree crops into the fallow system mimicked

the forest through the creation of a shade canopy (Amanor, 1994 *In:* McCann, 1999). However, the process resulted in the systematic cultivation of coca trees in the “virgin forest” (Hill, 1963 *In:* McCann, 1999). Clearing was identical to the classic fallow sequence: 1) Clearing and burning, 2) Three years of maize, yams and vegetables, 3) Shade crops of cassava, coco yam and plantain to protect the cocoa seedlings and 4) By year five, the cocoa trees were mature and the next section of forest was harvested. Rail and the motorized transport resulted in Ghana becoming the largest cocoa producer in the World, going from 500 tons in 1900 to 200,000 tons by 1930 (McCann, 1999).

Due to declining cocoa production, in the final quarter of the 20th century of - 71.1% (ILO, 2004), farmers turned to maize. Between 1975 and 1991, maize production increased from 319,700 ha to 610,400 ha; a 125%⁴⁹⁰ increase in area and a 230%⁴⁹¹ increase in yield (1 to 1.5 tons/ha) (McCann, 1999). About 67% of the farmers used maize as a cash crop in addition to feeding the household. In the 1990s, the Sasakawa/Global 2000 project introduced maize as part of a “Green Revolution” package, using hybrid seeds, fertilizer, herbicides, no-till and intercropping with legumes. Concern exists that relying completely on hybrids, will result in the loss of local varieties of maize and associated genetic germ plasm. This requires placing fields under permanent cultivation and using expensive inputs that must be subsidized by governments. The loss of farm subsidies under the World Bank Structural Adjustment program is encouraging farmers to continue clearing new lands in order to maintain enough fertility to produce the high yields of these hybrid varieties. In addition, this high yielding hybrid maize, unlike traditional maize, requires sunlight and complete elimination of forest cover – both primary and secondary. Cocoa can grow within a forest canopy. Concern is raised that with growing urban populations and the demand for food in the 21st century, the spread of this kind of maize farming spells dire consequences

⁴⁹⁰ Appears to be 91 %.

⁴⁹¹ Appears to be 50 % increase.

for both the forest fallow cultivation system and the forest canopy (McCann, 1999).

12.4.4.3 Impacts of structural adjustment on sustainable rice production in Madagascar

Until economic reforms in the 1980s, the state-controlled rice prices were kept low and stable. With reforms, prices were decontrolled, rose and became more volatile, due in part to sharp exchange rate devaluation and in part to the weakening state of private marketing infrastructure and financial markets. Fiscal cutbacks effectively ended rural road maintenance and reduction in public credit further increased price volatility and reduced the access of smallholders to cash for inputs. The increased mean and variance of rice prices induced Malagasy rice producers – most of whom were net rice buyers - to stimulate output by expanding the area in cultivation through further shortening of fallow periods and extensification into fragile forest margins. Moreover, cash constraints and the effects of devaluation on imported inputs reduced the traditionally low fertilizer use even further, thereby further de-intensifying production and forcing extensification (Reardon, *et al.*, 1999).

12.4.4.4 Impacts of structural adjustment on land hunger in Zimbabwe

Many Zimbabweans feel that the collapse of industrialization, strongly linked to World Bank and International Monetary Fund (IMF) Policies, resulted in massive retrenchments in urban centers, forcing people back onto the land (Murphree, 2001), exasperating an already existing land hunger in the over-crowded homelands. In a book written by Zimbabwean economists on the history of industrialization in this country, they explain the worst thing that has happened to

African countries is “Structural Adjustment” of the IMF/World Bank (Milambo, Pangeti & Phimister, 2000).

12.4.4.5 Impacts of structural adjustment on maize production in Malawi

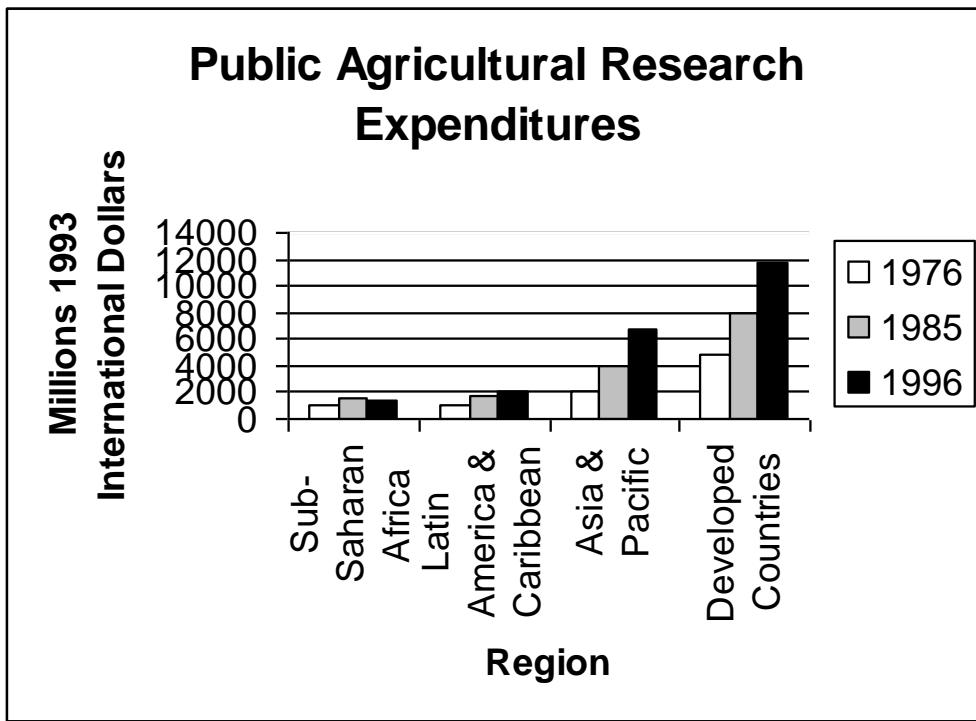
The IMF/World Bank Structural adjustment program advised the Malawian government to reduce free seed and fertilizer inputs in 1998, resulting in a decline in maize production from 2.4 million tons/year to 1.4 million tons/year. At the same time, the body that provided inputs and bought maize from farmers, the Agricultural Development and Marketing Corporation (ADMARC), was privatized. Thus, many farmers could not afford these inputs, a major reason production declined. The international donors, including the IMF, advised drawing down the National Strategic Grain Reserves from 167,000 tons to 30-60,000 tons, enough to last for a couple of months in an emergency prior to the arrival of international food aid. Somehow, the entire reserve was sold, flooding the local market, in turn resulting in a major decline in maize prices. This reduced incomes to local farmers and reduced their ability to buy seed and fertilizer. Because of structural adjustment disallowing government controls of food prices and due to shortfalls, maize prices went up for the population at large, becoming unaffordable and affecting diets. Cut backs in conditionalities reduced the government’s ability to plan through the national surveillance system and react to disasters. It was alleged that a small cartel of government elite manipulated food prices to their advantage. This was exacerbated by drought in 2001 and 2002 (Christian Aid, 2002).

12.4.5 Decline in Research and Extension as a Result of Structural Adjustment

Because of structural adjustment programs, there has been public under-investment in agriculture, from basic research to subsidization of inputs. In most of the African countries, public expenditures on agriculture, both capital and recurrent, amount to less than 10% of total government budget. This is a low rate of investment considering that for the majority of countries, agriculture accounts for more than 33% of GDP (Mule, 2003), while others say 20% of the GDP, (Maxwell, 2001 *In: Devereux & Maxwell, 2001; Roman, 2003*).

World Bank lending to agricultural support in Africa declined from almost 38-40% of its total lending in 1978, to 10% in 1996 and 7-10% in 2000 (UNECA, 2003; Roman, 2003). The FAO State of Food Insecurity in the World (FAO, 2002 *In: UNECA, 2003*) indicates that Official Development Assistance (ODA) to agriculture in developing countries declined by an alarming 48% in real terms between 1990 and 1999. These have negatively affected support to agricultural research and extension services in most African countries. Research and extension services are almost non-existent or dead. This has contributed to the decline in yields, as well as continued food insecurity (UNECA, 2003).

“Public spending for agricultural research in Africa stagnated in the 1980s and the 1990s at about US\$ 1,200 million(1.2 billion) per year, slightly higher than the level reached in 1976 (Figure 12.2). This contrasts to the situation of the 1960s and 1970s when public spending on agricultural research more than doubled, from about US \$360 million in 1961 to US \$993 million in 1976” (NEPAD, 2002).



Source: Extracted from NEPAD (2002), with permission NEPAD.

Figure 12.2: Public agricultural research expenditures, 1976-1996

“Public spending on agricultural research in Africa in comparison to agricultural GDP has also declined, from a peak in 1981 of 0.93% to 0.69% in 1991. By contrast, public spending in industrial countries on agricultural research amounted to about 2.4% of agricultural GDP in 1991...Reductions in government support for agricultural research and extension reflect in part pressures on African governments to reduce spending generally (structural adjustment). But spending on agricultural research has also declined in proportion to total government spending, as priorities have shifted and governments question the value of research and extension given the lack of improvement in agricultural productivity in Africa. Similarly, donor support to agricultural research has declined because of shifting priorities, until very recently, away from agricultural production to environmental protection, health, education, water and sanitation, and the like” (NEPAD, 2002).

“Even while funding for agricultural research stagnated in the 1980s and early 1990s, the number of scientists of national agricultural research systems (NARS) and the scope of their activities continued to grow. To meet rising staff costs, many NARS have been forced to cut non-wage operating expenses, starving programs of the many goods and services they need to be effective: laboratory supplies, equipment, spare parts, training, maintenance, fuel, and the like...Linkages between farmers, extension agents, and research systems in Africa are weak. Often researchers have little interaction with extension services and farmers, and do not reflect their priorities in the research agenda” (NEPAD, 2002).

This has been a similar problem in other resource sectors, including forestry, fisheries and wildlife.

Of major concern is the apparent rapid dissolution of agricultural research in South Africa. Traditionally, South Africa and Zimbabwe could feed all of southern Africa in basic food stuff, maize. In South Africa 35,000 farmers,⁴⁹² less than 0.1% of the population, feed 45 million South Africans, while producing a surplus of maize to carry the country over in lean times and to export regionally. Agricultural research and extension are the backbone of maintaining agricultural production and competitiveness in any country. The Agricultural Research Council (ARC) of South Africa, with its 81 branches, has declined from 4,800 employees in 1994, at the time of transition to a post-Apartheid government, to 2,554 at the end of March 2003. The ARC is responsible not only for agricultural research, but for veterinary research in its world famous Onderstepoort facility. The ARC plays a major role, not only in the food security of South Africa, but a major role in southern Africa, providing vaccines, for instance, for lung sickness to Zambia’s farmers (du Toit, 2004). The Government claims that these changes are, as the result of a transformation process, to make the ARC economically viable (Ryan, 2004). Agricultural research and its dissemination to farmers are

⁴⁹² National Department of Agriculture (2003) puts the number of commercial farmers at 50,000.

critical in assuring that South Africa is able to feed itself and the region. With Zimbabwe's virtual elimination of commercial farming, South Africa is the only country left on the continent that is food self-sufficient, to a large part relying on its competitive ability to adapt/adopt the latest technology through agricultural research. South African universities may have to play an increasingly important role in filling the gap in agricultural research.

12.5 DEBT AND STRUCTURAL ADJUSTMENT POLICIES

Debt is a discipline wielded over southern countries (Patel & Delwiche, 2002).

"Debt is an efficient tool. It ensures access to other peoples' raw materials and infrastructure on the cheapest possible terms. Dozens of countries must compete for shrinking export markets and can export only a limited range of products because of Northern protectionism and their lack of cash to invest in diversification. Market saturation ensues, reducing exporters' income to a bare minimum while the North enjoys huge savings. The IMF cannot seem to understand that investing in ... [a] healthy, well-fed, literate population ... is the most intelligent economic choice a country can make" (Shah, 2002).

"Many developing nations are in debt and poverty partly due to the policies of institutions such as the International Monetary Fund (IMF) and the World Bank. Their programs have been heavily criticized for many years for resulting in an increased dependency and poverty by the developing countries upon the richer nations. This is despite the IMF and World Bank's claim that they will reduce poverty. They impose Structural Adjustment Policies (SAPs) to ensure debt repayment in such a way that social spending and development must be cut back and debt repayment must be made the priority. In effect, the IMF and World Bank demand that these poor nations lower the standard of living of their people" (Shah, 2002).

Perkins (2006) documents how the West, especially the U.S., uses multilateral and bilateral loans to developing countries by setting conditions that require

employing the donor country's contractors (see Chapter 11, Section 11.7.2, Foreign Assistance Conditionalities Good Business For Donor County Not Recipient/Host Country). Many of these loans are based on faulty economic forecasts purposely made so that the developing country is strapped with debt, which it cannot pay off, becoming forever beholden to the donor country. The developing country becomes obliged to vote as requested in the UN, provide sites for military bases, and access to cheap oil and natural resources. The general tendency, because of such loans based on faulty economic projections, is that a few elite within a country become rich, while the poor become poorer.

Sub-Saharan Africa's debt crisis worsened during the 1980s, as the ratios of foreign debt to the continent's Gross National Product (GNP) rose from 51% in 1982 to 100% in 1992 and its debt grew to four times its export income in the early 1990s. In 1998, Sub-Saharan Africa's debt stock was estimated at \$236 billion and that of the whole continent was over \$300 billion. Africa's debt burden is twice that of any other region in the world -- it carries 11% of the developing world's debt, with only 5% of its income. GNP in Sub-Saharan Africa is \$308 per capita, while external debt stands at \$365 per capita (Colgan, 2001).

In 2000, 78% of SSA's debt was due to bilateral and multilateral donors. This debt amounted to 113% of exported goods and service (World Bank, 2001 *In: Sogge, 2002*). In 1998, in SSA, US\$ 16 billion was received in foreign aid, but only US\$ 3 billion went directly into general government budgets, while US\$ 9 billion was required to service debts (Sogge, 2002) (see Chapter 11, Section 11.7.1, Foreign Aid as Portion of Donor Country GNP).

“Each year developing countries pay the West nine times more in debt repayments than they receive in grants:

- The UK Charity Comic Relief⁴⁹³ raised £26 million (≈\$US 42 million) in 1997. Africa paid this back in debt service in just over a day.
- Each person in the Third World owes about £250 (≈\$US 408) to the West - much more than a year's wage for many.
- Of the 32 countries classified as severely indebted low-income countries, 25 are in Sub-Saharan Africa.
- Africa spends 4 times as much on debt repayment as she does on healthcare.
- In 1960, the income of the wealthiest 20% of the world’s population was 30 times greater than that of the poorest 20%. Today it is over 60 times greater.
- For a billion people, development is being thrown into reverse. After decades of steady economic advance, large areas of the world are sliding back into poverty.

Millions of people around the world are living in poverty because of Third World debt and its consequences...Sub-Saharan Africa owes £140 billion (≈\$US 228 billion) (83% of its total GNP). These enormous debts mean that repayments to Western Creditors take priority and ordinary people suffer: in poor health, in restricted access to education, in lack of employment and in limited ability to trade and provide for themselves” (ANON, 1998).

The Commission for Africa (2005) estimates that “for every \$US 2 Africa currently receives in aid, it pays back nearly \$US 1 in debt payments. Sub-Saharan Africa’s total external public debt totaled \$US 185 billion in 2003”.

⁴⁹³ Comic Relief was set up by comedians and uses comedy and laughter to get serious messages across and is committed to helping end poverty and social injustice, <http://www.comicrelief.com/>.

12.5.1 The HIPC Initiative - Half-hearted, Inadequate, Piecemeal Cancellation “Debt Relief”

In 1996, under intense pressure from popular movements in the North and South, western government creditors buckled.

“They launched a ‘half-hearted debt cancellation initiative’ – the Heavily Indebted Poor Countries (HIPCs) Initiative – under the World Bank’s aegis... Three and a half years later, at the beginning of June 1999, only 2.6% of the debts of 41 countries had been written off; and only 4 countries had received some debt relief (Uganda, Bolivia, Mozambique and Guyana). The rise in interest payments made by HIPCs wiped out any benefit gained by the four. The total debt of 41 HIPCs remained unchanged; \$216 billion in 1996; and \$216 billion in 1998. Even more disturbing, under the debt relief scheme, debt service paid by the poorest most indebted nations of the world, rose from \$25 billion a year to \$28 billion in 1998” (Hanlon & Pettifor, 2002).

Sachs (2005) believes that the “HIPC initiative itself was a recognition that the structural adjustment era had failed”.

The continent of Africa contains the most severely indebted countries in the world. Twenty-six countries (Palmer & Kline, 2003), 38 according to Lerrick (2005), are now receiving debt relief under the Heavily Indebted Poor Countries (HIPCs) Initiative (Palmer & Kline, 2003). Of these, 19 still spend more than 10% of government revenues on debt repayments. For some of the world’s poorest countries, this amounts to a massive transfer of scarce resources. Zambia, for example, is spending more on debt repayments – US\$ 183 million a year – than it spends on health or primary education (Palmer & Kline, 2003). Lerrick (2005) places HIPC debt globally at US\$ 144 billion, of which 94% are official loans from Western donors; US\$ 57 billion (39.6%) in bilateral debt and \$US 79 billion (54.9%) in multilateral debt. Of this HIPC debt, about US\$ 118 billion is

in Sub-Saharan Africa that contains 32 of the current 38 HIPC countries (Lerrick, 2005). Bilateral aid comes from national donors (see Chapter 11, Section 11.7.1, Foreign Aid as Portion of Donor Country GNP). Multilateral donors in Sub-Saharan Africa include:

- The International Monetary Fund (IMF)'s "bank" is the General Resources Account (GRA) that borrows from its members and re-lends the proceeds;
- The IMF: Special Disbursement Account /Poverty Reduction and Growth Facility (SDA/PRGF) Trust Funds: The IMF's "fund" is composed of a series of trusts and special lending facilities;
- The International Bank for Reconstruction and Development (IBRD) at the World Bank.
- The International Development Association (IDA) fund at the World Bank gathers contributions from rich countries and redistributes resources to poor members through 30-40 year loans at virtually non-existent 0.5-2% interest; and
- The African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) and Fund.

The Secretary General of the UN, the United Nations Children's Fund (UNICEF), the Organization for African Unity, religious leaders and non-government organizations all expressed concern that too little debt relief was being delivered too late. A related concern was that the HIPC framework had not been integrated into a wider strategy for poverty reduction (OXFAM, 1998). The U.S. Congressional sponsored Meltzer Commission (2000) recommended that HIPC debt should be forgiven in its entirety, conditional on the debtor countries implementing institutional reforms and an effective development strategy.

"Finally on 8 February 2000, three countries were announced as having reached 'decision point' and therefore qualifying for HIPC II debt relief. They were Bolivia, Uganda and Mauritania. Whilst this modest announcement was welcomed, campaigners were amazed that Mozambique and Guyana, who had already qualified and received relief under HIPC I, did not automatically qualify for the second *tranche* (portion) of relief, but were being delayed for technical reasons. This became even more shocking when it became apparent that floods in Mozambique had devastated crops in many parts of the country and left thousands homeless. Equally shocking was the case of Madagascar, also hit by hurricanes and floods. Madagascar is on the HIPC list and, despite the floods, is not due to receive debt cancellation until 2001 at the earliest, and will have to pay \$233 million in debt service while it tries to rebuild its country.

The current system for qualifying for debt relief (under HIPC II) requires that countries have carried out an IMF austerity economic program for at least 3 years. These conditions are exhaustive and often contradictory. For example, Tanzania's current list of conditions demand that it 'limits public spending' whilst also 'building and maintaining quality public services'.

In response to criticisms from campaign groups and UN agencies that IMF conditions concentrate too much on austerity measures, and not enough on poverty reduction, the World Bank and IMF introduced in September 1999 a new set of economic hurdles for indebted nations to jump" (Hanlon & Pettifor, 2002).

The IMF renamed its structural adjustment facility the Poverty Reduction and Growth Facility (PRGF). In 2000, borrowing countries began preparing Poverty Reduction Strategy Papers (PRSPs) as a prerequisite for a World Bank/IMF adjustment loan. These PRSPs are supposed to outline—after a broad consultative process—a country's poverty-reduction priorities and economic policies to achieve them. These PRSPs serve as a framework for lending by International Finance Institutions (IFIs) such as the World Bank and IMF and from bilateral donors. The September 2005 "African Action Plan" (World Bank, 2005) appears to follow the PRSP process. Its goals (health, clean water, education, nutrition, agricultural development, development of an African private sector, export led

growth, improving infrastructure and debt relief), while laudable, are “old wine in a new bottle”. What must be asked is will this result in more government-to-government foreign assistance (see Chapter 11, Section 11.7.1.1, Overseas Development Assistance [ODA] versus Overseas Assistance [OA]) leading to further spiraling debt or will development be driven by the private sector based on beneficiation of Sub-Saharan Africa’s natural resources?

The UN (2002) says this about IMF and World Bank policies,

“The international community has begun to address these concerns. ‘Ownership’ and ‘participation’ are now buzzwords. The World Bank has introduced a Comprehensive Development Framework to help donors coordinate their support for a country’s chosen strategy. IMF has renamed its Enhanced Structural Adjustment Facility the Poverty Reduction and Growth Facility and has revamped it around the new vehicle of Poverty Reduction Strategy Papers (PRSPs) (which the World Bank also plans to support via Poverty Reduction Credits), which present a country’s own deliberated strategy for tackling poverty. These initiatives go very much in the right direction. The question is whether they go far enough...a new relationship between the donor community and Sub-Saharan Africa is needed if the prospects of that troubled region are to improve...Each potential aid recipient would elaborate its own development strategy, programs and projects, primarily in consultation with its own population but also in a dialogue with donors”.

Many NGOs and civic groups in PRSP countries argue that the fundamentals of SAPs remain unchanged (Welch 2001; Sogge, 2002).

“The PRSP is supposed to be put out to wide civil society consultation. But the IMF told Mozambique and Mauritania that they could obtain rapid approval for debt relief under HIPC only if they did not put the PRSP out for public consultation” (Hanlon & Pettifor, 2002).

Colgan (2001) also questions the adequacy of civil society involvement in this process. Stiglitz (2002) believes that the World Bank is much more open to “participatory poverty assessments” than the IMF. He goes on to say that these joint IMF, World Bank, greater civil society assessments are a step in the right direction, even if there is a gap between rhetoric and reality, but if the gap persists for too long, it could, and is, resulting in disillusionment.

NGOs argue that PRSPs incorporate structural adjustment policies that have consistently failed, reflecting the pressures on governments to conform to the policy expectations of the Bank and IMF; governments writing into the PRSPs what they already know the donors want to hear (Wood, 2000; UNCTAD, 2002). The PRSP process has, so far, failed to change structural adjustment programs or to force the International Finance Institutions (IFIs) to prove how their policies will help poor people and promote sustainable development (Welch, 2001). The PRSP process is also criticized as being too complex.

“The World Bank’s online handbook advising countries on how to prepare such documents (PRSPs) runs well over 1,000 pages and covers such varied topics as macroeconomics, gender, the environment, water management, mining, and information technology. It would be hard for even the most skilled policymakers in the advanced economies to follow such complex (no matter how salutary) advice” (Easterly, 2001).

Surveys by the United Nations Economic Commission for Africa (ECA)

“agreed that PRSPs are broadly pro-poor. But it was not quite as sanguine about the effectiveness of implementation and the likelihood that the poor will actually benefit from pro-poor programs. In Ghana, one of the countries that reduced poverty in the 1990s, a recent survey by the Ghana Statistical Service reported that only a quarter of respondents said they were better off while half said they were worse off” (World Economic Forum, 2004).

The ILO (2004) states,

“Conditions attached to debt relief and cancellation are legitimate if they ensure that the savings are channeled into growth-enhancing, employment-creating and poverty-reducing programs which respond to the needs of people. But they must not reproduce past structural adjustment policies that have not worked, such as dogmatic demands for privatization and reduced public services. The heads of the Bretton Woods Institutions have indicated that this is no longer the case, and recent evidence now shows increases in public spending on education and health associated with the HIPC”.

12.5.2 2005 Debt Cancellation

In mid-June 2005, the G-8 finance ministers agreed to write-off US\$ 40 billion in debt to 18 HIPC countries, 14 in Sub-Saharan Africa. Eventually, 38 nations with 552 million people may get full debt relief (McLaughlin, 2005) with a package amounting to US\$ 55 billion (CNN, 2005).⁴⁹⁴ This will save the 18 countries a total of US\$ 1.03 (DATA, 2005a; 2005b) to 1.5 billion/year (McLaughlin, 2005), that is to be used for health, education and agricultural development. Concern exists that, as has happened in the past, debts will be forgiven and a new set of foreign aid loans will create a new cycle of dependency (Lerrick, 2005; McLaughlin, 2005).

How significant is this debt relief? As per the US\$ 1 billion/year that the US\$ 40 billion debt-relief initiative is projected to save poor African nations, the International Energy Agency expects the rise in oil prices to cost poor African

⁴⁹⁴ Countries currently qualifying for debt relief include in Africa: Benin, Burkina Faso, Ethiopia, Ghana, Madagascar, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Tanzania, Uganda and Zambia. In Latin America: Bolivia, Guyana, Honduras & Nicaragua. Countries that could soon qualify: Cameroon, Chad, Congo, Gambia, Guinea, Guinea-Bissau, Malawi, Sao Tome & Principe, & Sierra Leone (McLaughlin, 2005).

countries US\$ 10 billion (Washington Times, 2005), wiping out potential benefits from debt relief as the key to resolving Sub-Saharan Africa's economic ills.

12.5.3 Why Debt Relief Can't Work

"Debt relief is not new. As long ago as 1967, the UN Conference on Trade and Development argued that debt service payments in many poor nations had reached 'critical situations.' A decade later, official bilateral creditors wrote off \$6 billion in debt to 45 poor countries. In 1984, a World Bank report on Africa suggested that financial support packages for countries in the region should include 'multiyear debt relief and longer grace periods.' Since 1987, successive G-7 summits have offered increasingly lenient terms, such as postponement of repayment deadlines, on debts owed by poor countries. (Ironically, each new batch of terms and conditions was named after the opulent site of the G-7 meeting, such as the 'Venice terms,' the 'Toronto terms,' and the 'London terms.') In the late 1980s and 1990s, the World Bank and International Monetary Fund (IMF) began offering special loan programs to African nations, essentially allowing governments to pay back high-interest loans with low-interest loans—just as real a form of debt relief as partial forgiveness of the loans. The World Bank and IMF's more recent and well-publicized Highly Indebted Poor Countries (HIPC) debt relief program therefore represents but a deepening of earlier efforts to reduce the debt burdens of the world's poorest nations" (Easterly, 2001).

"During the last two decades, the multilateral financial institutions granted 'structural adjustment' loans to developing nations, with the understanding that governments in poor countries would cut their fiscal deficits and enact reforms—including privatization of state-owned enterprises and trade liberalization—that would promote economic growth. The World Bank and IMF made 1,055 separate adjustment loans to 119 poor countries from 1980 to 1999. Had such lending succeeded, poor countries would have experienced more rapid growth, which in turn would have permitted them to service their foreign debts more easily. Thirty-six poor countries received 10 or more adjustment loans in the 1980s and 1990s, and their average percentage growth of per capita income during those two decades was a grand total of zero.

The lesson of structural adjustment programs is that reforms imposed from the outside don't change behavior. Rushing through debt forgiveness and imposing complex reforms from the outside is as doomed to failure as earlier rounds of debt relief and adjustment loans" (Easterly, 2001).

12.5.3.1 Debt relief creates more debt

"In reality the foreign debt of poor countries has always been partly fictional. Whenever debt service became too onerous, the poor nations simply received new loans to repay old ones. Indeed, over the past two decades, new lending to African countries more than covered debt service payments on old loans" (Easterly, 2001).

However, the new loans must be repaid with interest, so the debt only worsens. From 1989 to 2002, 38 of the world's poorest countries, mostly in Africa, received US\$ 40 billion in debt relief and still piled up US\$ 93 million in new loans. By the end of 2004, they owed US\$ 144 billion to multilateral institutions such as the World Bank and IMF, other countries and private banks. Debt cancellation and foreign aid are small pieces to a broader strategy that will reduce poverty, addressing trade issues being the key (Sparshott, 2005). Similarly, Lerrick (2005) concludes,

"the HIPC debt burden is phantom and imposes no demands on impoverished economies. For the last 20 years, each and every HIPC nation, regardless of corruption, waste and failure to comply with conditions, has benefited from an annual net inflow of official funds...a system of 'defensive lending' has miraculously matched the dates and amounts of repayment and interest schedules to disbursements under 'new' loans to create a perpetual rollover of defaulted debt obligations. Adding interest compounds the loans as well as the problem...Only a name separates rotating defaulted loans in perpetuity from the finality of debt cancellation. No real resources have been transferred out of the poorest debtor economies to the multilaterals because the debt has not been effectively repaid. Year by year, every poor

country outflow has been offset by a predictable and assured balancing inflow”.

Meanwhile, poverty continues to increase in most Sub-Saharan African countries as indicated by declining per capita GNIs (GNPs) (Lerrick, 2005).

The Democratic Republic of Congo and Debt Relief

For instance, the Democratic Republic of Congo is requesting a US\$ 10 billion of US\$ 13 billion debt write-off by lenders (Walker, 2002). At the same time, The International Monetary Fund (IMF) has agreed to a \$750 million loan to the Democratic Republic of Congo, intended to help reduce poverty and promote economic growth (IMF, 2002; Walker, 2002). Thus, “...Debt relief encourages borrowers to take on an excessive amount of new loans expecting that they too will be forgiven” (Easterly, 2001). One has to wonder, with possibly the richest mineral and oil wealth in the world, why does the Democratic Republic of Congo need bank loans? (see Chapter 13, Section 13.10.3, Congo-Kinshasa DRC, Africa’s world resource war).

12.5.3.2 Debt relief/cancellation does not reduce poverty

“Debt relief advocates should remember that poor people don't owe foreign debt—their governments do. Poor nations suffer poverty not because of high debt burdens but because spendthrift governments constantly seek to redistribute the existing economic pie to privileged political elites rather than try to make the pie grow larger through sound economic policies... bad governments are likely to engage in new borrowing to replace the forgiven loans, so the debt burden wouldn't fall in the end anyway. And even if irresponsible governments do not run up new debts, they could always finance their redistributive ways by running down government assets (like oil and minerals), leaving future generations condemned to the same overall debt burden. Ultimately, debt relief will only help reduce debt burdens if

government policies make a true shift away from redistributive politics and toward a focus on economic development” (Easterly, 2001) (see Chapter 13, Section 13.9, GLOBALIZATION, AFRICA AND RESOURCE WARS – CAPITALISM WITHOUT A CONSCIENCE – BOOTY FUTURES).

Lerrick (2005), along with the Meltzer Commission (2000) and the present Bush Administration, support full debt cancellation since developing countries will never be able to repay this debt. In turn, they believe foreign aid should consist of performance-based grants, as opposed to loans that will encourage Foreign Direct Investment (FDI) and economies driven by the private sector that help create a middleclass on the subcontinent. Performance-based policies include transparency, good governance and devolution of land and resource tenure to the rightful owners, among others. The U.S. Millennium Challenge Account is based on this principle (see Chapter 13, Section, 13.16, NEW MILLENNIUM CHALLENGE ACCOUNT).

12.5.3.3 Debt relief/cancellation and military spending

“Debt relief enables governments to spend more on weapons, for example. Debt relief clients such as Angola, Ethiopia, and Rwanda all have heavy military spending” (Easterly, 2001).

It is the authors’ experience in Sub-Saharan Africa that writing off or relieving debt is of little value by itself, even if this debt was incurred during the dictatorial, and often repressive, regimes supported by the West during the Cold War to the detriment of civil societies in these countries; “Odious Debt”. Debt relief can only be a temporary fix, a form of welfare, unless Sub-Saharan Africa starts standing on its own two feet and stops relying on continually being propped up by more foreign aid loans with interest rates that it can never hope to repay.

In other words, writing off the bad debt of the Cold War, in which loans were squandered and stashed away in personal Swiss Bank Accounts of the ruling elite, while the West buried its head in the sand, and/or more new debt relief will not solve the subcontinent's long-term economic ills nor reduce poverty.

Stephen Hayes of the Corporate Council on Africa in Washington, referring to the aid and lending paradigms that have dominated development work for decades, “‘I don't think Africa develops without a middleclass,’ he says, ‘and that will emerge only through trade and entrepreneurship’ ” (McLaughlin, 2005). The U.S. and Britain are miles apart on foreign aid, with the U.K. adopting the formula of 0.7% of the GNP, while Washington has declined a numerical commitment preferring trade over aid, such as the African Growth and Opportunity Act (AGOA) (see Chapter 13, Section 13.13.6.2, AGOA) (Latham, 2005; Wolfson, 2005). Regardless, the real issues in the long-term are agricultural subsidies (Latham, 2005) and other protectionist measures, as discussed above (tariffs, quotas, etc.), that adversely impact Sub-Saharan Africa’s economies and the need for Foreign Direct Investment (FDI) in Sub-Saharan Africa.

12.6 IMPACTS OF STRUCTURAL ADJUSTMENT ON SOCIAL WELFARE AND EMPLOYMENT

“The decades in which Asia was investing, the 1970s and 1980s, were the years of crisis when African governments were slashing the budgets of both clinics and schools at the behest of the International Monetary Fund (IMF). Evidence shows that IMF and World Bank economic policy in the 1980s and early 1990s took little account of how these policies would potentially impact on poor people in Africa. Many health and education systems began to break down. And all of this came just as AIDS began to take its deadly toll” (Commission for Africa, 2005).

12.6.1 Health and Structural Adjustment

Health is a fundamental human right, recognized in the Universal Declaration of Human Rights of 1948, and the Constitution of the World Health Organization of 1946. Health is also an essential component of development, vital to a nation's growth and internal stability. Investments in health care by African governments in the 1970s achieved improvements in key health indicators.

The health care systems inherited by most African states after the colonial era were unevenly weighted toward privileged elites and urban centers. In the 1960s and 1970s, substantial progress was made in extending primary health care and to emphasize the development of a public health system to redress the inequalities of the colonial era. The World Health Organization (WHO) emphasized the importance of primary healthcare at the historic Alma Ata Conference in 1978. The Declaration of Alma Ata focused on a community-based approach to health care and resolved that comprehensive health care was a basic right and a responsibility of government (Colgan, 2002).

“These efforts undertaken by African governments after independence were quite successful. There were increases in the numbers of health professionals employed in the public sector, and improvements in health care infrastructure in many countries. There was also some success in extending care to formerly unserved areas and populations. Across the continent, there were improvements in key health care indicators, such as infant mortality rates and life expectancy” (Colgan, 2002):

- “In Zambia, the post-independence government expanded public health care services throughout the country. The number of doctors and nurses was also significantly increased during this time. Infant mortality was reduced from 123 per 1,000 live births in 1965, to 85 in 1984” (Colgan, 2002)
- “In Tanzania, during the first two decades of independence, the government succeeded in expanding access to health care nationwide. By 1977, more than 75% (three-quarters) of

Tanzania's population lived within 5 km of a health care facility" (Colgan, 2002).

- "In Kenya child mortality was reduced by almost 50% in the first two decades after independence in 1963" (Colgan, 2002).
- "Across Sub-Saharan Africa, the first decades after independence saw significant increases in life expectancy, from an average of 44 years to more than 50 years" (Colgan, 2002).

While the progress across the African continent was uneven, it illustrated a commitment by African leaders to the principle of building and developing their health care systems. With the economic crisis of the 1980s and 1990s, as African governments became clients of the World Bank and IMF, they forfeited control over their domestic spending priorities. The loan conditions of these institutions forced contraction in government spending on health and other social services (Colgan, 2002).

World Bank and IMF policies exacerbated poverty, providing fertile ground for the spread of HIV/AIDS and other infectious diseases. Cutbacks in health budgets and privatization of health services eroded previous advances in health care and weakened the capacity of African governments to cope with the growing health crisis. In the 42 poorest countries in Africa, spending on health care fell by 50% during the 1980s.

"The dramatic drop in health expenditure in the 1980s and 1990s resulted in the closure of hundreds of clinics, hospitals and medical facilities across the continent...Thousands of health care professionals throughout the continent lost their jobs as a result of public sector cuts. In Ghana, between 1982 and 1992, the number of doctors in the government health care system dropped from 1,700 to 665. In Senegal, between 1980 and 1993, the number of people per nurse increased six-fold" (Colgan, 2002).

Consequently, during the past two decades the life expectancy of Africans has dropped by 15 years (Colgan, 2002).

By the 1990s, most African countries were spending more repaying foreign debts, than on health or education for their people. By 1997, Sub-Saharan African governments were transferring to Northern creditors four times what they were spending on the health of their people (Colgan, 2002):

- In the 21st century, Zambia is paying three times as much in debt service as on health care (UNDP, 2002 *In:* Patel & Delwiche, 2002), as the result of the structural adjustment program; and
- In 1998, Senegal spent five times as much repaying foreign debts as on health (Colgan, 2002).

By 1992, the U.S. Center for Disease Control in Atlanta was condemning the World Bank and IMF imposed “user fees” as part of SAP policies, resulting in a plummeting utilization of health care facilities in Sub-Saharan Africa with the consequence of exacerbating the spread of HIV/AIDS (Bond & Manyanya, 2003).

12.6.1.1 Increase in poverty and decline in health from structural adjustment

“The relationship between poverty and ill-health is well established. The economic austerity policies attached to World Bank and IMF loans led to intensified poverty in many African countries in the 1980s and 1990s. This increased the vulnerability of African populations to the spread of diseases and to other health problems” (Colgan, 2002) (see Chapter 5, Section 5.4, HUNGER LINKED TO POVERTY).

“The public sector job losses and wage cuts associated with World Bank and IMF programs increased hardship in many African

countries. During the 1980s, when most African countries came under World Bank and IMF tutelage, per capita income declined by 25% in most of Sub-Saharan Africa. The removal of food and agricultural subsidies caused prices to rise and created increased food insecurity. This led to a marked deterioration in nutritional status, especially among women and children.

In Zambia, following the elimination of food subsidies, many poor families had to reduce the number of meals per day from two to one. Malnutrition resulted in low birth weights among infants and stunted growth among children in many countries. It is currently estimated that one in every three children in Africa is underweight. In general, between 25% (one-quarter) and 33% (one-third) of the population of Sub-Saharan Africa is chronically malnourished” (Colgan, 2002).

Low birth weights and malnourished children during the first four to five years of life will impact on their learning ability (see Chapter 5, Section 5.3.1.1, Worldwide over-production of food, a big question in the 21st century and Section 5.3.3, Food Security in Africa and Section 5.4, HUNGER LINKED TO POVERTY).

Some improvements in health, gained over the 1960s and 70s, have been turned back or stopped in many countries since the 1980s, when the debt crisis broke. The number of children who die before the age of five, or before the age of one, has risen in many deeply indebted countries, including Zimbabwe, Zambia, Nicaragua, Chile and Jamaica, after decades of falling numbers. In Zimbabwe, spending per head on healthcare has fallen by 33% (one third) since 1990, when a Structural Adjustment Program was introduced. In Uganda, £2 per person is spent on healthcare, compared with £11.50 per person on debt repayments (ANON, 1998).

“Diseases thought to be eradicated - tuberculosis, yaws, yellow fever - are making a comeback in some countries as treatment and vaccination coverage declines” (ANON, 1998).

“The deepening poverty across the continent has created fertile ground for the spread of infectious diseases. Declining living conditions and reduced access to basic services have led to decreased health status. In Africa today, almost half of the population lacks access to safe water (see Chapter 11, Section 11.13.2.4, Safe drinking water in Africa as a health indicator) and adequate sanitation services. As immune systems have become weakened, the susceptibility of Africa's people to infectious diseases has greatly increased” (Colgan, 2002).

“A joint release issued by the WHO and the Joint UN Program on HIV/AIDS (UNAIDS - Joint United Nations Program on HIV/AIDS) in April 2001 reports that the number of cases of tuberculosis in Africa will reach 3.3 million/year by 2005. The WHO reported in 2001 that almost 3,000 Africans die each day of malaria. Each year in Africa, the disease takes the lives of more than 500,000 children below the age of five” (Colgan, 2002).

Most devastating of all has been the impact of the HIV/AIDS pandemic. The spread of HIV/AIDS in Africa has been facilitated by worsening poverty and by the conditions of inequality intensified by World Bank and IMF policies. Economic insecurity has reinforced migrant labor patterns, which in turn have increased the risk of infection. Reduced access to health care services and health education has increased the spread of sexually transmitted diseases and the vulnerability to HIV infection. More than 17 million Africans have died of HIV/AIDS. It is currently estimated that more than 28 million of the 40 million people living with the disease worldwide are in Sub-Saharan Africa. There are more than 12 million African orphans who have lost their mothers or both parents to AIDS. The social and economic effects of the AIDS crisis are reversing post-independence progress and exacerbating conditions of under-development. The policies imposed by the World Bank and IMF have fueled the spread of the disease and continue to hinder the response to this health emergency (Colgan, 2002) (see Chapter 5, Section 5.8, HIV/AIDS DECLINING AGRICULTURAL PRODUCTION AND FOOD SECURITY IN SSA).

12.6.2 Education and Structural Adjustment

The major decline in GDP, as a result of structural adjustment, meant that while Sub-Saharan Africa's investment in education, compared to the percentage of its GDP, is middle of the road (ILO, 2004) compared to the rest of the world, as Africa's per capita GDP fell from US\$ 671 in 1975 to US\$ 245 by 1997 (Zack-Williams, 2002 *In: Zack-Williams, et al., 2002*), the money available for education significantly declined. Additionally, structural adjustment policies took away free education, requiring the payment of fees, which the majority in Sub-Saharan Africa could not afford to pay. In October 2000, the World Bank was instructed by the U.S. Congress never to impose policies requiring user fees on education and health care, with water being added in 2002 (Bond, 2002). In 2002, the U.S. Congress and the president signed a law requiring the United States to oppose proposals for International Finance Institutions (IFIs) to charge fees for primary schools under the name of "cost recovery". However, this appears to have been largely ignored and given the secrecy in which the IMF operates, it is hard to ascertain if this has had any impact on the ground (Stiglitz, 2002).

Yet, education is a key element in a global economy where education, skills and knowledge are increasingly important for economic survival, let alone success (ILO, 2004).

"At Tanzania's independence in 1961, 85% of adults were illiterate, and less than half the country's children were in school. Although some countries were better off—Nigeria and Ghana, in particular, had long histories of educational development at home and study abroad—others were even further behind. At Mozambique's independence in 1975, 93% were illiterate, and less than 33% (a third) of primary-age children were in school. Africa's first post-independence generation—broadly speaking, from the 1960s to the end of political Apartheid in South Africa in 1994 - made significant advances. Most notably, the newly independent

states educated far more of their children than preceding colonial regimes, and many made impressive strides in delivery of basic health care and potable water, expansion of infrastructure, and industrial production for the domestic market" (Minter, 2001).

Structural Adjustment ended this progress.

"As schools are forced to charge fees, fewer people are able to send their children and education is mainly available only to the better-off. In Sub-Saharan Africa the damage to education has been particularly significant: the percentage of 6-11 year olds enrolled in school has fallen from nearly 60% in 1980 to less than 50% in 1990. In Tanzania, school fees have been introduced as part of a Structural Adjustment Program, leading to a drop in primary and secondary school enrolment" (ANON, 1998) (see Chapter 11, Section, 11.13.1.1 Educational situation in Sub-Saharan Africa at the beginning of the new millennium).

Currently, the Tanzanian government spends twice as much per capita on debt repayments as on education and four times as much on debt repayment as on primary education. More than two million Tanzanian children are not in school and illiteracy is rising at 2%/year. In some schools there is one desk for every 38 pupils, one textbook for every four children and one toilet for every 89 pupils. Classrooms crumble unless parents can fund their rebuilding. Teachers have been left demoralized by falling salaries, worsening conditions and increasing class sizes (OXFAM, 2000).

On the other hand, President Museveni of Uganda has ignored IMF advice and has created universal primary education for all, resulting in a massive increase in enrollment of both boys and girls (Stiglitz, 2002), which will help in the transformation of Uganda in what Museveni calls a pre-industrialized society to an industrialized society, straight into the information age. The rigid IMF policies often fail to take into account these important social and development issues needed to transform the continent in favor of strict economic, often short-term,

fixes at all costs, which most of the time have not straightened out the economies, but only made them worse. The principal author was in Uganda in 2002. In some areas, there were schools literally every 5-10 kilometers, indicating not only the success of President Museveni's education platform, but raising an ominous problem facing much of the continent, a very large portion of society under 15 years of age exploding into the workforce, and hoping for a better way of life than their parents.

Much of the impacts of Structural Adjustment and the Washington Consensus on education in Sub-Saharan Africa are summed up in a conversation between the Past President of Tanzania, Julius Nyerere, and a World Bank "expert", when President Nyerere was asked by the expert why he had failed (*In: Legum, 2002*):

" 'The British Empire left us a country with 85% illiterates, 2 engineers and 12 doctors. When I left office in 1985, we had 9% illiterates and thousands of engineers and doctors. At that point our income per capita was 2x what it is today – after the Structural Adjustment program - We now have 33% (one third) less children in our schools, and public health and social services are in ruins. During those years, Tanzania has done everything that the World Bank and the IMF have demanded. So I ask you: Why have you failed?" "

12.6.3 Employment and Structural Adjustment

"The IMF encourages hard-pressed governments to cut back spending and downsize government departments (necessary!). This often means a rise in unemployment and a cut in wages. Real wages in most African countries have fallen by 50-60% since the early 1980s. In Mexico, Costa Rica and Bolivia average wages have fallen by 33% (a third) since 1980. Unemployment has risen in many countries in Africa and Latin America since the 1980s - in Zambia, Tanzania and Ghana, over 20% of the working population are unemployed. High levels of unemployment are counterproductive as there are fewer taxpayers to contribute to the

public purse. So governments raise less through taxation" (ANON, 1998).

12.7 NET RESULT OF STRUCTURAL ADJUSTMENT ON AFRICA – NEGATIVE

"The past two decades of World Bank and IMF structural adjustment in Africa have led to greater social and economic deprivation, and an increased dependence of African countries on external loans. The failure of structural adjustment has been so dramatic that some critics of the World Bank and IMF argue that the policies imposed on African countries were never intended to promote development. On the contrary, they claim that their intention was to keep these countries economically weak and dependent" (Colgan, 2002).

The net result of structural adjustment has been a sharp decline in real income, especially for urban populations dependent on imports for such basic necessities as food and fuel. For example, between 1980 and 1984, the purchasing power of urban worker's wages declined by 50% in Tanzania and by 40% in Ghana (World Bank, 1986 *In: Martin & O'Meara, 1995*). Yet one of the largest economies in the World, the USA, seems to function almost as well under a balanced budget (William (Bill) Jefferson Clinton Era) as under deficit spending (Reagan and Bush Administrations). It would seem that the Third World is being forced to take a medicine often ignored by the First World. Ultimately, SAPs contributed to the proletarianisation of the middleclasses, bringing an army of bureaucrats, intellectuals and professionals into the ranks of workers, peasants and the unemployed.

"Virtually the entire group of development NGOs, like OXFAM, WDM (World Development Movement) and Christian Aid, are highly critical of the policies imposed by the IMF under ESAF (Enhanced Structural Adjustment Facility). They do not reduce poverty and mainly benefit the better off in poor countries; they seem designed more to benefit large corporations by giving them

cheaper raw materials and access to new markets. The Wall Street Journal has waded in to give support to these views. In a searing attack on the retiring managing director of the IMF, Michel Camdessus, the journal accused the IMF, under Camdessus of a bias toward devaluation, which is supposed to 'revive' exports even as the inevitable, resulting inflation quickly diminishes the resident population's incomes and assets. Impoverishing people in this way is morally indefensible and politically unsustainable" (Hanlon & Pettifor, 2002).

In fact, Sub-Saharan African (SSA) people living below a poverty line, as defined at US\$ 1/day, increased from 217 million to 291 million from 1987 to 1998, averaging around 46% of the total population over the period. A more recent study by the UNCTAD secretariat, using the World Bank's definition, but a different methodology (bringing together household survey and national accounts data), estimates that the proportion of the population living on less than US\$ 1 a day in the Least Developed Countries (LDCs) of Africa has increased continuously since 1965–1969; rising from an average of 55.8% in those years to 64.9% in 1995–1999. Over the past two decades, where growth in income in SSA has barely kept pace with population, (structural) adjustment policies, including trade and financial liberalization, privatization and retrenchment of the public sector, have played a significant role in the hollowing out of the middleclass. Poverty alleviation can succeed only if it leads to rapid and sustained growth and job creation (UNCTAD, 2002; Gavlak, 2002). Some people call structural adjustment policies a form of "Economic Apartheid" between the First World and the Developing World (Global Issues, 2002b) (see Section 12.1.1, Historical Perspective).

12.7.1 Structural Adjustment and Zimbabwe

The IMF and World Bank are instruments of Western governments and multi-nationals to extract raw products from Africa and other Third World countries. The net result of the Economic Structural Adjustment Program (ESAP) on Zimbabwe was: 1) Devaluation of the local currency, 2) Inflation, 3) Inability of local people's buying power for locally manufactured products, let alone imported products and 4) Inability to access FOREX to buy spare parts and new machinery to maintain competitiveness in the international market place (Milambo, *et al.*, 2000).

Local industries folded and it was cheaper for the West to come in and take out raw products (e.g., Africa's minerals), in order to obtain the added value of transformation in Europe and America, maybe even selling the transformed product back to Africa. Countries like Zimbabwe remain welfare states forever, dependent on Western donors who take much more than they give (Milambo, *et al.*, 2000).

In 1998, Zimbabwe spent 38% of its export earnings to service foreign debt. The “Economic Structural Adjustment Program” (ESAP), designed in 1990 by the World Bank and IMF to deregulate and indebt an economy seen as over-protected and inefficient, was adhered to by the Zimbabwe ruling party, Zimbabwe African National Union – Patriotic Front (ZANU-PF). Its failure was fundamental to the model imposed on Zimbabwe (Bond & Manyanya, 2003).

12.7.1.1 Import substitution

A tentative economic strategy based on substituting imported goods with local products began (import substitution). By 1926, manufacturing contributed 13% of the colony's Gross National Product (GNP), small companies producing products for the local black consumer market. Still, the economy remained extractive based on agriculture and mining exports, which rose to £ 6.6 million by 1929 (Bond & Manyanya, 2003). The worldwide depression of the 1930s saw a 50% decrease in the foreign market for Zimbabwe's goods. This forced Zimbabwe to deglobalize and develop its own internal economy and local industry began to flourish in iron, steel and cotton spinning, along with state credit to help farmers develop their land. White miners were encouraged to operate small independent gold operations, as foreign companies' mineral rights were taken over. The railroad was nationalized (Bond & Manyanya, 2003). In 1933, an all-white election chose self-governance over uniting with South Africa. Output more than tripled over the next decade, the economy growing from £9 to £ 28 million in constant 1929 currency (Barber, 1961 *In:* Bond & Manyanya, 2003).

Successful "import substitution" industrialization polices, mostly run by white entrepreneurs, as opposed to failed state parastatals common across most of the continent in post-independent Sub-Saharan Africa, made the colony increasingly self-reliant. Food processing of agricultural produce provided added value and accounted for 1/3rd (33%) of the manufacturing. Small manufacturers of clothing and textiles grew, aimed at the black consumers whose wages by 1950 composed 25% (1/4) of the national income. Manufacturing grew by an average of 24.4% annually from 1944-1948 (Sowelem, 1967; Stoneman, 1981; Phimister, 1988 *In:* Bond & Manyanya, 2003). However, as in the agricultural economy of the southern United States prior to its Civil War, the high profits of these white-

owned industries were built on the “slave” wages of the black workers whose living conditions remained appalling, with construction of formal Apartheid-style townships (Bond & Manyanya, 2003).

12.7.1.2 Beginning of World Bank interventions

After WWII, investments by multi-national corporations nearly quadrupled the value of their holdings from 1948 to 1951. However, by 1956, huge loans from the World Bank and big commercial banks in London, New York and South Africa resulted in debilitating foreign debt; financial outflows reaching 14% of the Central African Federation (Northern and Southern Rhodesia – today’s Zambia and Zimbabwe, respectively). This was further exasperated by the copper market crash affecting the economy of Northern Rhodesia. State-capitalist planning intervention began to take place in Southern Rhodesia by the late 1950s (Bond & Manyanya, 2003).

12.7.1.3 UDI and second period of deglobalization

By 1965, the Unilateral Declaration of Independence (UDI) led by Ian Smith, in a response to racial reform from Britain and the rest of the World, resulted in international sanctions, forcing Zimbabwe into developing an even greater “import substitution” economy, mostly from domestic demand expansion and diversification of already existing industries. The result was one of the World’s fastest growth rates of 9.5% annually from 1966-1974. Exchange controls trapped local financial resources and profits of multi-nationals (Bond & Manyanya, 2003).

12.7.1.4 Civil war and economy of scale

The civil war of the 1970s (40,000 civilian deaths, 50% of the white population emigrating), drought, high oil prices and lack of foreign exchange began to result in economic stagnation. Local industry began diversifying into luxury goods for the white market, as opposed to the black consumer market; a niche that would have provided a much greater regional outlet after the end of UDI and sanctions. Industrialization was running into economy-of-scale problems with an over-production of these luxury goods to a limited white settler market, which at its maximum was 250,000 compared to the lowly paid black worker whose purchases accounted for more than 50% in the turnover of furniture, clothing, footwear, etc. (Bond & Manyanya, 2003).

The civil war resulted in a 40% reduction in economic output from 1976-1979, leading to the 1979 Lancaster House Agreement (guaranteeing white retention of landholdings). This, along with the indecisive military victory of Zimbabwe African National Union – Patriotic Front (ZANU-PF) – Zimbabwe African People's Union (ZAPU), as well as nationalist infighting, left much of the economic power in the hands of the whites, while conceding political control to black Zimbabweans. White Rhodesians and the West were stunned by the 95% turnout of black voters in April 1980 and the victory of Robert Mugabe's ZANU party (62% of the vote) compared to only 8% for Bishop Abel Muzorewa's moderate collaborationist party whom they hoped would win (Bond & Manyanya, 2003). One of the key components of Mugabe's platform was land reform, already discussed in Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife.

12.7.1.5 Inheritance of colonial debt by newly independent Zimbabwe

Robert Mugabe inherited a colonial debt based on foreign loans (Bond & Manyanya, 2003):

- US\$ 5.3 million in multilateral debt – Kariba Dam debt;
- US\$ 97.9 million in bilateral debt;
- US\$ 593.9 million in private debt;

In 1980 alone, more than US\$ 65 million was required in debt servicing. Bond and Manyanya (2003) have advocated defaulting on these colonial loans, saying that they were used in the uneven development of settler capitalism, and forced black Zimbabweans to pay twice for colonial oppression in what they call “Odious (detestable) Debt”, these loans being taken out to use and repress them as low-paid slave labor to build the colonial economy and then being asked by the International Finance Institutions (IFIs) and banks to pay back the money (Bond & Manyanya, 2003). Colgan (2001), Bond (2002) and Stiglitz (2002) believe that colonial and post-colonial Odious Debt, often part of Cold War politics to assure alignment with the West, contracted by dictatorships or repressive regimes and used to strengthen the hold of these regimes, are illegitimate; including the Apartheid-caused debt inherited by South Africa, and should be cancelled.

12.7.1.6 Beginning of neo-colonialism

With the flight of so many whites, a black middleclass began emerging, moving onto white farms, suburban homes and taking up jobs left behind. By 1974, with the help of the World Bank, local European businessmen created the Whitsun Foundation to make loans to this emerging black middleclass. Bond and

Manyanya (2003) contend that the national development plan laid out by this foundation was a blue print for neo-colonialism:

- Cuts in social spending;
- User fees for social services;
- Opening up (Liberalization) of trade and financial markets (e.g., free-trade – or no trade barriers to protect local industries;
- High interest rates;
- Base economy on exports (even if mostly raw materials);
- Privatization of state parastatals; and
- Deregulation.

Excess production capacity through the 1980s was still a major problem, due to the limited buying power of the majority of Zimbabwe's citizens who remained poor (Bond, 1998 *In: Bond & Manyanya, 2003*).

Throughout the 1980s, the majority of Zimbabwe's white-owned domestic manufacturers were oriented to the global market, but lacking state of the art technologies from a protected national market in which they had no competition. Foreign exchange loans were made to these owners through the World Bank Manufacturing Rehabilitation Loan (1981), the Bank Manufacturing Loan (1983) and the Export Incentive Scheme, in addition to being allowed a generous depreciation. To increase export revenues, currency was periodically devaluated. In 1984/85, the Zimbabwe Dollar was devaluated by 40%, along with budget cuts and a reduction of the maize subsidies. The main beneficiaries were agricultural and mineral exporters – raw products (Bond & Manyanya, 2003), but with no upgrades in manufacturing capabilities allowing for the added value of transformation to be retained in Zimbabwe.

12.7.1.7 Zimbabwe's economic structural adjustment program (ESAP) and de-industrialization

By 1990, Zimbabwe had adopted ESAP and moved towards becoming a one-party state. Export orientation and a high debt crisis allowed what some call, “petite-bourgeois leadership” that abandoned alliances with workers and peasants, emerging as the new ruling class while forming an alliance with foreign and local institutions needed to maintain their power. Real wages were kept low, with excess profit accruing to capital – thus, the majority of the workers would be poorly paid to maximize profits for the owners (Hinds, 1990 *In: Bond & Manyanya, 2003*), but as a result, would have low buying power needed to purchase manufactured products. A lower black middleclass was built through the bureaucracy based on corruption and patronage, which identified more with Washington (i.e. World Bank, IMF and USAID) than the people (Murapa, 1977 *In: Bond & Manyanya, 2003*). This resulted in a high level of foreign debt.

International financial interests gained dominance in the local economy. As trade and financial restrictions were removed, Zimbabwe entered into an economic depression, exacerbated by droughts in 1992 and 1995. More debilitating was Zimbabwe's de-industrialization and crash in workers' standard of living resulting from SAP policies. ESAP failed miserably (Bond & Manyanya, 2003):

- Between 1991 and 1995, GDP growth averaged 1.2%;
- Inflation was 30% from 1991-1995 instead of the targeted 10%; and
- The budget deficit was more than 10% of GDP down from the targeted 5%.

The foreign exchange controls were dismantled, becoming market driven. Leading businessmen benefited from luxury good imports, declining real wages

and newfound ability to move money out of the country. South Africa dropped its free-trade arrangement (1964 - 1992) with Zimbabwe, resulting in a massive trade deficit. The 1991 Open Guaranteed Import License resulted in imports more than doubling beyond projections, many being luxury goods. Under this license raw materials and machinery could also be imported. However, in retaliation for South Africa's refusal to renew the free-trade agreement, South African imports were taxed by Zimbabwe customs, finished products being taxed less than raw products. As a result, the trade deficit exploded (Bond & Manyanya, 2003). The capacity to export was weak:

- Zimbabwe failed to qualify as least-developing country for trading purposes;
- Trade liberalization tended to turn manufacturers into traders, manufacturers tending to import cheaper rather than produce products locally, which were more costly; and
- Because of failures in democracy, they did not qualify for export concessions under the U.S. African Growth and Opportunity Act (AGOA) (see, Chapter 13, Section, 13.13.6.2, AGOA).

The manufacturers' contribution to GDP fell 18% during the 1990s. De-industrialization ravaged the textiles, metals, transport equipment and clothing manufacturers. One problem was that the buying power of the wage earner significantly decreased. Average annual earnings as a percentage of 1980 levels declined (Bond & Manyanya, 2003):

- Civil servants, -65%;
- Domestic workers, -62%;
- Construction workers, -56%;
- Teachers, -50%;

- Farm workers, -48%;
- Miners, -20%; and
- Manufacturing employees -19%.

The manufacturing sector output crashed from peak 1991 levels and the standard of living of the average Zimbabwean worker was devastated. Lower wages did not result in new jobs, as industry was shutting down, not expanding, a tiny fraction of the annual 200,000 school leavers finding employment (Bond & Manyanya, 2003). Local buying power thus collapsed, as did standards of living.

Total formal-sector jobs, including agriculture, rose from just under a million at independence to 1,244,000 in 1991 and then remained flat. Urban employment rose from 454,000 in early 1980 to 620,000 in 1991, falling to 590,000 by the end of 1995. Average annual earnings, after inflation, rose only $\frac{1}{2}$ (0.5) % per year from 1980-1990, then fell by more than 10% annually from 1991-1995.

12.7.1.8 Devaluation

The Zimbabwe dollar lost (Bond & Manyanya, 2003):

- 70% of its value against the U.S. dollar between 1980 and 1990; and
- Another 67% from 1991-1995.

In 1995, there were about ZD\$ 7/US\$ 1. By November, 2003, the official exchange rate was ZD\$ 847/US\$ 1, while the black market rate was ZD\$ 6,000/US\$ 1 (SABC, 2003), climbing to a black market rate in March 2007 of ZD\$ 25,000/US\$ 1 (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife).

12.7.1.9 Inflation

Inflation averaged 13.4% from 1980-90 and 27.6% from 1991-95 under ESAP (Bond & Manyanya, 2003), projected to climb to 10,000% inflation by 2008 (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife).

12.7.1.10 Decline in social programs

In the early 1990s, under ESAP, workers and poor suffered from cost recovery policies (user fees) for health and education, resulting in a reversal in these sectors made in the 1980s.

In the 1980s, Zimbabwe had (Bond & Manyanya, 2003):

- Reduced infant mortality from 86 to 49/1,000 live births;
- An immunization rate that improved from 25% to 80%;
- A life expectancy that increased from 56 to 62 years; and
- A doubling primary school enrollment.

In the 1990s (Bond & Manyanya, 2003):

- Primary school dropout increased, especially among girls due to school fee increases;
- Per capita spending on health care fell by 20%, while HIV/AIDS hit pandemic levels; and
- Health workers and teachers left the public sector for better paying jobs, often overseas (e.g., nurses recruited for hospitals in England, a similar problem to South Africa in 2004).

In essence, Zimbabwe and the rest of the developing world were forced to adopt structural adjustment policies, taking steps that the Western capitalism had never imposed on itself. In the West, starting in the late 19th century, redistribution softened the harshest effects of capitalism through such social safety-nets as progressive taxation, social security, minimum wage, worker safety regulations, antitrust laws, free education, reasonable health care and unemployment insurance; something that Westerners take for granted. Meanwhile, ESAP policies discouraged such government subsidies, encouraging *laissez-faire* economics, resulting in extremes in lifestyles between the elite, virtually no middleclass and the extreme poor, a form of capitalism abandoned by the West a century ago (Chua, 2003). ESAP policies favored elite, the “market dominant minorities” such as the Lebanese in West Africa, the Indians in East Africa, the Tutsi of Rwanda/Burundi and the whites of Southern Africa. With little or no middleclass as a buffer, these economic inequalities ultimately result in a backlash by the majority poor against the rich minority, disrupting the economy (Chua, 2003) (e.g., irrational land reform against whites in Zimbabwe, riots in Zambia against the Indians, kicking all Indians out of Uganda during the Obote/Amin era, 2003/2004 rioting and violence forcing many French to flee the Ivory Coast, and in Kenya the anti-white movement in 2004 and ethnic Kikuyu cleansing in 2008) and in the extreme, the genocide seen against the Tutsi (see Chapter 5, Section 5.7.1.3, Improperly planned land tenure and impacts on wildlife and conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara, Kenya & Chapter 11, Section 11.6.4, Dangers of Economically Repressed Majority Being Handed Political Power through One Man One Vote Elections).

12.7.1.11 Export-led growth a fantasy

As in most of Africa during the neo-liberal epoch, exports increased but the economy declined. As every country was encouraged to export more, the global

prices of raw materials fell dramatically during the 1980s and 1990s (Bond & Manyanya, 2003). Since 1980, the value of a basket of Sub-Saharan export products has been cut by about 50% (half) compared to the value of imports from the North (Toussaint, 2001 *In:* Bond & Manyanya, 2003). Under development could not be solved with more Washington-based loans. The foreign debt treadmill and the Balance of Payments (BOP) crisis pushed foreign debt in Zimbabwe as a percentage of GDP from 8.4% to 21.8% from 1991-1996 (Bond & Manyanya, 2003).

Bond and Manyanya (2003) believe that Zimbabwe's post-independent government was driven into a cul-de-sac by the neo-liberal policies of ESAP, both locally and globally. Around 1997, when it became evident that ESAP was incapable of lifting Zimbabwe from chronic dependency, actually exacerbating under-development, political degeneration was the next logical process as a means of clinging on to power.

12.7.1.12 Impacts of structural adjustment on the wildlife and parks estate in Zimbabwe

The net result of structural adjustment on Zimbabwe's Department of National Parks and Wildlife Management (DNPWM) was a loss of 250 staff, all ministries being required to cut their staff by 10%. This resulted in a loss of an important skill base that had already been fleeing because of low salaries and poor moral, to NGO's and the private sector (Duffy, 2000). Some of the "white flight" can also be attributed to dissatisfaction by white technicians and managers who had fought in the liberation war, over being controlled by a black government. The ESAP reforms resulted in operational expenditures in the Wildlife and Parks Estate declining from US\$ 24/km² in 1988 to US\$ 2.63/ km² by 1993, along with devaluation of the Zimbabwe dollar and rising inflation (Duffy, 2000). This

crippled the ability of the government to undertake the necessary management of its protected areas (see Chapter 10, Section 10.5, RHINO, TRADE OR TRADE CONTROL, WHAT'S BEST FOR CONSERVATION?). Recommendations at privatizing the DNPWM and/or tendering out services, as proposed by the World Bank, were seen by some elements of the ruling ZANU-PF party as intended to empower the whites once again – and rightfully so, since most black Zimbabweans had little training in the tourism and safari industry, links to the markets or the finances to run such operations (see Chapter 11, Section 11.6.3.1, Patronage politics, Zimbabwe's Department of National Parks and Wildlife Management (DNPWM)).

12.7.2 Famine in Malawi

Malawi's 2002 famine was the result of selling off the country's grain stocks to repay commercial bankers at the advice of the IMF (Bond, 2002) (see Section 12.4.4.5, Impacts of structural adjustment on maize production in Malawi).

12.7.3 Famine amongst Food Surpluses in India – Lessons for Africa

Of the 830 million hungry people worldwide, a third (33%) of them live in India (Jensen, 2002; Shiva, 2002). It is estimated that 200 million out of 800 million Indians do not have enough land, income or access to food transfers to secure adequate calories (Eicher & Staatz, 1990; Madeley, 2002). Yet in 1999, the Indian government had 10 million tons of surplus food grains, mainly rice and wheat. In the year 2000, that surplus increased to almost 60 million tons - most of it left in the granaries to rot (Jensen, 2002; Shiva, 2002) while waiting to be exported (Madeley, 2002).

“Instead of giving the surplus food to the hungry, the Indian government was hoping to export the grain to make money. It also

stopped buying grain from its own farmers, leaving them destitute. The farmers, who had gone into debt to purchase expensive chemical fertilizers and pesticides on the advice of the government, were now forced to burn their crops in their fields. At the same time, the government of India was buying grain from Cargill and other American corporations, because the aid India receives from the World Bank stipulates that the government must do so. This means that today India is the largest importer of the same grain it exports. It doesn't make sense - economic or otherwise" (Jensen, 2002).

People are starving (in India) because the policy structures that defended rural livelihoods, access to resources and markets and hence, entitlements and incomes, are being systematically dismantled by structural adjustment programs, driven by the World Bank and by WTO rules imposing trade liberalization. Deregulated imports are a major cause of poverty and famine in countries like India. Globalization has dismantled the systems, which guaranteed domestic market access for farmers, a system which brought food security to the poor. India's domestic production of edible oil has been effectively wiped out, as highly subsidized soya from the U.S. and palm oil from Malaysia flood the market due to lack of adequate import controls. Imports now account for 70% of the domestic consumption of edible oil. This has resulted in coconut farmers in Kerala blockading their local harbor to protest against such imports. Groundnut farmers and soya bean farmers in a number of areas mounted demonstrations against this attack on their livelihood. As a result, they were shot at (Shiva, 2002).

12.8 CORRUPTION AND FAILURE OF IMF/WORLD BANK PROGRAMS

There "is no real impetus for change because the people who are paying the price for this reckless lending and borrowing are the ordinary, poor citizens who are often unable to raise their voices in protest. The lending institutions can keep rescheduling the loan and adding interest; the contractor gets paid, the borrowing government

gets its cut and will probably be long gone when the people find out what has really been going on. The system works very well for elites in both countries, and unless a new open, transparent system is established, it is likely to continue...The World Bank's own evaluation of project performance in the 1990s showed that in the poorest countries, and in South Asia and Africa, between 60% and 70% of projects failed:

...In Nigeria at least 61 development projects financed by more than \$5 billion in foreign loans have either failed or never opened, according to a government commission...

...Tanzania owes the World Bank more than \$575 million for 26 failed agricultural projects, according to the Tanzania Coalition on Debt and Development. The World Bank's own Operations and Evaluations Department admitted in 1998 that it failed to involve Tanzanians in appraising the projects before they went ahead, and that 'pilot projects went to the Board as proven undertakings; early warnings of failings by World Bank technical staff and co-financiers were ignored' " (Hanlon & Pettifor, 2002).

"Structural adjustment policies have placed considerable emphasis on measures to reduce the size of and resources allocated to the civil service in Africa. However, and contrary to expectations, in spite of such measures, corruption has remained unabated, even showing a tendency to rise and penetrate various aspects of economic and social life...role of domestic and international business groups in corrupting the state apparatus is almost totally disregarded...economic corruption related to granting government contracts and privatization of public enterprises do not appear to be a serious source of concern for the African poor" (UNCTAD, 2002) [(see Chapter 11, Section 11.11.6.2, Modern conservation and the Baka Pygmy that discusses impacts of privatizing marketing boards; Section 11.11.7, Case study Bongo in the Congo (Brazzaville) and Chapter 12, Section 12.3.4.3, Structural adjustment and creation of government bourgeoisie].

Poor people are often ignorant of the issues and are too worried about trying to survive to take the time to learn.

12.8.1 South Africa/Lesotho

In the mid-1980s, as the anti-Apartheid sanctions campaign was gaining global force, conservative forces were looking for ways to support Apartheid South Africa. The European Community [now European Union (EU)] and World Bank agreed to back a \$2 billion dam in Lesotho (totally surrounded by South Africa) to supply water to South Africa (see Chapter 7, Section 7.6.1, Lesotho Highlands Water Project [LHWP] and Chapter 13, Section 13.11.2, Lesotho Highlands).

12.8.2 The Meltzer Commission, Restructuring the IMF and World Bank

The U.S. Congressional Meltzer Commission (2000) recommended

“that the IMF be restructured as a smaller institution with three unique responsibilities which, if properly performed, would increase global stability, improve the functioning of markets, and help countries improve domestic monetary and fiscal policies:

1. to act as a quasi-lender of last resort to solvent emerging economies by providing short-term liquidity assistance...that would not retard the development of those institutions within the recipient country that would attract capital from commercial sources;
2. to collect and publish financial and economic data from member countries, and disseminate those data in a timely and uniform manner that permits market participants to draw useful information about member countries' economic performance across time and across countries; and
3. to provide advice (but not impose conditions) relating to economic policy...”.

Similarly, the Zedillo Report (High-Level Panel on Financing for Development) recommended that the IMF streamline conditionalities and that borrowing countries should be given the opportunity to choose their own path to reform (United Nations, 2001).

With regard to the World Bank reform, the Meltzer Commission (2000) recommended that the World Bank be renamed World Development Agency and that the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) be renamed the African Development Agency. Additional reforms include (Meltzer Commission, 2000):

1. “Grants should replace the traditional Bank tools of loans and guarantees for physical infrastructure and social-service projects. Grant funding should be increased if grants are used effectively...”
2. Development Agencies should be precluded from financial crisis lending...
3. The World Bank should become the principal source of aid for the African continent until the African Development Bank/*Banque Africaine de Developpement* (ADB/BAD) (Agency) is ready to take full responsibility.....
4. The World Development Agency should concentrate on the production of global public goods and serve as a centralized resource for the regional agencies. Global public goods include improved treatment for tropical diseases and AIDS, rational safeguarding of environmental resources, inter-country infrastructure systems, development of tropical agricultural technology, and the creation of best managerial and regulatory practices.....
5. Private-sector involvement by the development institutions should be limited to the provision of technical assistance and the dissemination of best practice standards. Investment, guarantees, and lending to the private sector should be halted....
6. The World Bank and the regional development banks should write off in entirety their claims against all Heavily Indebted Poor Countries (HIPC)s that implement an effective economic development strategy under the Banks' combined supervision.
7. The United States should significantly increase its support of effective programs to reduce poverty. The six dollars per capita currently spent is too much for ineffective programs but too little for effective programs”.

The Bush administration proposes that 50% of the International Development Association (IDA)⁴⁹⁵ resources be distributed as grants, not low-interest loans. Contributions from the USA would be tied to the future effectiveness of IDA (established in 1960 to provide soft “concessional” loans) programs. The US Treasury Secretary Paul O’Neill (now ex-Secretary) has said that giving money to health, education and sanitation projects in developing countries would be more effective than giving loans to governments “ ‘that sometimes waste the resources’ ” (House of Commons, 2002) (see Chapter 11, Section 11.13, AREAS WHERE FOREIGN AID CAN MAKE A DIFFERENCE – HEALTH AND EDUCATION).

It appears that there is little evidence on the ground for these reforms (Madeley, 2002). While lauding the National Security Strategy of the United States that would aid countries with appropriate national reforms, improve the effectiveness of the World Bank and other development banks to raise living standards, insist on measurable indicators of development, provide large amounts of development assistance in the forms of grants over loans, secure public health, emphasize education and continue aiding agricultural development, Sachs (2005) found a disconnect between rhetoric and financial commitment by the U.S. Government.

⁴⁹⁵ The World Bank is made up of the International Bank for Reconstruction and Development (IBRD) plus the International Development Association (IDA).

12.9 THE WAY FORWARD

The International Labor Organization (ILO) (2004) believes that there is a glaring inequity in the global trading system in trade barriers by the North against labor-intensive goods produced in the South.

“These are items in which the South has comparative advantage, and which are vital for their growth and development prospects. On this, we share the broadly held view that unfair barriers to market access must be substantially reduced, and that this will provide important opportunities to developing countries. But we must also point out that this will not be a panacea. The interests of the LDCs will have to be safeguarded through the WTO provisions for Special and Differential Treatment to nurture their export potential. South-South trade barriers remain high and developing countries can do much to help themselves through reducing these. In addition, certain principles other than just fair market access must also be respected in order to make the global trading system fully fair to all” (ILO, 2004).

12.9.1 Export Transformed Products; It’s Not Rocket Science

“If a society spends one hundred dollars to manufacture a product within its borders, the money that is used to pay for materials, labor and, other costs moves through the economy as each recipient spends it. Due to this multiplier effect, a hundred dollars worth of primary production can add several hundred dollars to the Gross National Product (GNP) of that country. If money is spent in another country (e.g., buying transformed products from another country), circulation of that money is within the exporting country. This is the reason an industrialized product-exporting/commodity-importing country is wealthy and an undeveloped product-importing/commodity-exporting country is poor” (Smith, 1994 *In:* Shah, 2002).

“An economy with a higher share of manufacturing in total value added is generally less exposed to external shocks, price fluctuations, climatic conditions and unfair competition policies” (UNECA, 2004).

This is where Africa must head, into transforming raw products in Africa, prior to exporting them.

12.9.2 Changes Needed by OECD “Developed” Countries

There is a need for a more collective voice and through regional organizations, such as the New Partnership for Africa’s Development (NEPAD), comes the capacity to negotiate international agreements (United Nations, 2002). Palmer and Kline (2003) believe that “to fight a war on unfair-trade rules, the G-8 countries (G-7 + Russia) should:

- Immediately stop using subsidies and export credits that cause over-production and dumping of surpluses in developing countries.
- Open their own markets to all products from Africa and other low-income countries.
- Amend WTO patent rules in order to improve developing countries’ access to affordable, generic medicines for HIV/AIDS and other diseases, as promised in Doha in 2001”.

To some degree, less expensive generic anti-retro viral drugs are beginning to become available and/or drug companies have drastically reduced the prices in Africa (see Chapter 11, Section 11.13.2.2, HIV/AIDS).

“Documented in previous UNCTAD reports, such countries continue to face significant trade barriers in their more affluent trading partners, notably the industrial countries, in the two sectors which can make the greatest contribution in these respects, i.e. agriculture and labor-intensive manufactures. In this respect, some recent initiatives, including the Everything but Arms (EBA) initiative of the European Union (EU) (see Chapter 13 Section 13.13.6.3, Other agreements) and the African Growth and Opportunity Act (AGOA) of the United States (see Chapter 13,

Section 13.13.6.2, AGOA) are significant steps in the right direction. Nevertheless, continued protectionism in agriculture constitutes perhaps the most important external impediment to resource mobilization in many developing countries in Africa, where this sector could provide considerable ‘vent for surplus’ needed to generate resources for creating jobs in industry...The expansion of industry requires exports and this is one of the major external obstacles which, far from having been eliminated, is becoming worse...Clearly, the long-term solution lies in improving the productive capacity of the region and resolving the deep-seated imbalances and distortions in the international trading system in areas of export interest to African countries. There is now a consensus among the major international institutions that the cost of protectionism in industrial countries for Africa tends to be very high and that market access for African products needs to be improved. However, the trade policy advice to the African countries needs to be based on a realistic assessment of what can be achieved in this respect. Many of the increased Balance of Payments difficulties in developing countries today, including those in SSA, have their origin in the failure to pay adequate attention to forces of protectionism in industrial countries in designing trade policies in structural adjustment programs” (UNCTAD, 2002).

Additional Recommendations (Welch, 2001):

- The U.S. should work to refocus the IMF on short-term lending and ensure that PRSPs provide for genuine country-driven economic development plans;
- Washington’s priority should be the encouragement of sustainable, equitable development that benefits local people rather than (just) Transnational Corporations (TNCs); and
- The U.S. should push for greater transparency and for social and environmental impact assessments of adjustment lending. The U.S. should also insist on delinking structural adjustment conditions from debt relief.

12.9.3 Role of Sub-Saharan African Governments in Diversification through Industrialization

Trade liberalization policies should clearly benefit the poor and trade liberalization in the South should not be encouraged in economic sectors where the U.S. and Europe retain trade barriers (Welch, 2001).

While some economists believe that opening markets will result in economic growth and development, making one more competitive, many economists analyzing the developing world believe that countries should open markets once they become competitive (Steenkamp, *pers. comm.*).⁴⁹⁶ UNECA (2004) sums up this issue by stating that

“the industrialized countries need to be aware of the need for a generous timeframe for liberalization if African economies are to be able to strengthen supply-side capacities and compete adequately in global markets...export diversification is rarely, if ever, achieved in a strictly laissez-faire policy environment”.

Quoting the Zedillo Report (High-Level Panel on Financing for Development), it is argued that a priority for any Development Round of the WTO is the need to consider how to legitimize time-bound protection of certain industries, by country, in the early stages of industrialization (UNECA, 2004):

“ ‘However misguided the old model of blanket protection intended to nurture import substitute industries, it would be a mistake to go to the other extreme and deny developing countries the opportunity of actively nurturing the development of an industrial sector.’ ”

⁴⁹⁶ Ezra Steenkamp, Department of Agriculture, Private Bag X791, PRETORIA, 0001, Tel: +27 12 319 6110, e-mail: <mailto:ezras@nda.agric.za>.

One such example is that the “East Asian Miracle” (Singapore, China and Malaysia) was brought about by state interventions, including states playing an important role in fostering export competitiveness and by using mechanisms, including the maintenance of export-friendly effective exchange rates and the granting of large subsidies to exporters; trade policies being part and parcel of broader national development strategies (UNECA, 2004). The Asian Newly Industrialized Countries (NICs) tended to adopt import substitution in the 1950s and 1960s until their nascent industries were competitive, followed by export-led industrialization in the 1970s and 1980s, at all times government playing a major role in helping these economies develop (Alemayehu, 2000). In the East Asian Miracle, government took a more active role in promoting economic growth, abandoning the religion that the market knows best, intervening, as in the West, in technology transfer, education and health, and industrial planning and coordination (Chomsky, 1999). In the East Asian Miracle,

“There are important lessons to be learned here for Africa, although this goes against the contemporary paradigm concerning the merits of trade liberalization, which focuses excessively on removing the impediments to imports, but provides little guidance regarding how to strengthen export capacity and promote diversification” (UNECA, 2004).

Alemayehu (2000) argues that opening up a nascent industry to “free-trade” prior to the industry becoming competitive in the global market is “tantamount to forcing a baby to run before crawling” and results in deindustrialization, as they cannot compete against established industries with strong market links.

Sanctions, in essence, created a protected market in both Zimbabwe (Southern Rhodesia) (see Section 12.7.1.1, Import substitution) (Alemayehu, 2000) and South Africa. South Africa would likely not have developed its automotive and arms industries, among others, if it had not been for sanctions, in essence, *de facto*

protected industries. South Africa, the only truly industrialized nation in Sub-Saharan Africa, maintains a number of protective trade tariffs, just as the OECD countries, such as anti-dumping controls to protect key industries (Mabiletsa, 2003). For instance, South Africa protects their sugar industry with import tariffs, making it about twice as expensive for local consumers than the world price (Steenkamp, *pers. comm.*). Section 12.2.4 (Agricultural Tariffs and Subsidies, Hiding Domestic Trade and Production Subsidies, Green, Blue and Amber Boxes) discusses percent Producer Subsidy Equivalent/Producer Support Estimate (PSE)/(%PSE) that help make South African products competitive internationally and/or protect South African producers.

Likewise, Mauritius, whose economy is based on textiles, sugar and tourism, has a market that is very protected from imports. Its export sector has been kept open by segregating the export sector from the import sector (UNECA, 2004):

- Duty-free access provided to all imported inputs (e.g., raw products used in manufacturing), resulting in a competitive export sector;
- Tax incentives to firms operating in the Export Processing Zone (EPZ); and
- Labor market for the export sector segmented from the rest of the economy, with greater flexibility in the EPZ regarding overtime payments and discharging workers.

UNECA (2004) found that

“over the last two decades many African countries have abandoned attempts at providing financial and technical support for domestic industry. Yet providing such support need not be controversial”:

- Selective interventions by governments in overcoming the market and institutional failures in building the capabilities required for export sector development;
- Develop generalized industrial policy targeted at certain kinds of activities (e.g., investment, research and development, training, etc.) rather than selective interventions to support particular industries or firms;⁴⁹⁷ and
- Coherent policies are required across ministries, including trade, employment, education agriculture, transport, etc. to increase competitiveness of African economies.

A Trade Competitiveness Index (TCI) for African countries has been developed as a tool for policy makers in Africa to be able to identify where the competitive shortcomings of their countries lie compared to other African countries.

“Using a total of 34 indicators, the TCI is divided into three components, each capturing a different dimension of trade competitiveness: a Trade Enabling Index, reflecting the overall economic and political environment's conduciveness to trade; a Productive Resource Index, measuring the availability of direct inputs to production, such as land and labor force; and an Infrastructure Index, measuring the availability of indirect inputs such as a physical infrastructure that enables the movement of goods and services. These three sub-indices received equal weighting to comprise the TCI, which in turn allows the identification of the most competitive countries in terms of trade as well as identification of bottlenecks to an improved trade performance” (UNECA, 2004).

This authors believe that a major emphasis on education and moving into an industrial/high technology information age economy is the only hope of saving the people and the natural systems which traditionally supported them, but which

⁴⁹⁷ This is the path that industrialized countries like the U.S. took supporting national research and development programs and infrastructure projects, along with a complicated system of tax breaks, etc. (UNECA, 2004).

are being mined in an unsustainable manner as a result of being out of balance with the ever-growing human population and antiquated government policies regarding resource and land tenure. UNECA (2004) believes placing an emphasis on industrialization will be critical to economic development. This also means diversification through transforming the raw products, which are currently the basis of most Africa's economies, in Africa rather than in the West. Obtaining this added value will 1) employ more people, 2) increase their standard of living assuming Africa assures that slave wages are not paid, 3) help urbanize Africa in a civil manner, avoiding the slums, pollution and poverty of places like Nairobi, Kenya, that support the current industrial process based on slave labor and little or no environmental pollution controls, 4) urbanization will take pressure off the rural natural resources and be more conducive to seeing a bit of "Wild Africa" survive, linked to empowering the people in rural Africa to become "owners of these natural systems" and the right to manage and benefit from them, 5) an urbanized and better educated society will be more environmentally conscience since they will hopefully no longer only worry about survival from day to day – "the subsistence mentality", 6) birth rates will decline as children go from being producers in the rural economies (free or cheap farm labor – an asset) to consumers – a deficit in an urban economy and 7) with an educated middleclass there is a strong likelihood that leaders will be held accountable and that Africa will begin finding its own solutions to democracy.

Foreign capital goes where the economy is already working and the prospects of low-risk profit are good (Legum, 2002). Thus, the conditions for transparency, good governance, reinvesting national assets into infrastructure and into assuring a healthy and educated work force, will be required by African governments if they wish to attract Foreign Direct Investment (FDI).

12.9.4 Consumer Beware

“But no one at the UN or in the First World is willing to acknowledge the dream’s impossibility: the unsustainability of a world in which the Third World’s large population were to reach and maintain current First World living standards. It is impossible for the First World to resolve that dilemma by blocking the Third World’s efforts to catch up...impossible for the First World alone to maintain its present course...depleting its own resources as well as those imported from the Third World...untenable politically for First World leaders to propose to their own citizens that they lower their living standards, as measured by lower resource consumption and waste production rates. What will happen when it finally dawns on all those people in the Third World that current First World standards are unreachable for them, and that the First World refuses to abandon those standards for itself...the crudest tradeoff...encouraging and helping all people to achieve a higher standard of living, without undermining that standard through overstressing global resources” (Diamond, 2005).

Hoogvelt (2002 *In: Zack-Williams, et al.*, 2002) believes that Westerners must change their lifestyles, which are dependent on the rapacious extraction of wealth from the African continent. The first step is the recognition at the collective intellectual and emotional level that what is wrong with Africa is actually wrong with us (Westerners). In commenting on an interview with a Shell Oil Executive who blames everyone, but themselves for the human and environmental tragedy in the Niger Delta (see Chapter 13, Section 13.10.1.3, Oil and Repression in the Niger Delta – Nigeria), including a corrupt Nigerian Government and the consumer, she goes on to say:

“We are involved. We in the center and the heartland of the global capitalist system are the cause, and the excuse of much plunder, degradation and dereliction in the margins of the world. It is our own humanity that is at stake if we continue profit from this stake. Blaming Africans for complicity in this trade does not let us off the hook. Our lifestyle, and our conditions of socio-economic well-being depend on environmental plunder and pauperization in large

parts of the world, including Africa" (Hoogvelt, 2002 *In: Zack-Williams, et al.*, 2002).

12.10 CONCLUSION

Agricultural subsidies and protected markets in Europe and America have been a disincentive to the development of commercial agriculture, for both food and export in Sub-Saharan Africa. Subsidies are so contentious that talks broke down at the September 2003 World Trade Organization (WTO) meeting in Cancun, Mexico. Africa and many developing countries, feel that they have a comparative advantage for certain crops (e.g., cotton) if subsidies and trade barriers were dropped by the West, including barriers against transformed products. In July 2004 in Geneva, Switzerland, a tentative agreement was reached between the developing world and the G-8 to eliminate certain export subsidies for Western farmers in return for developing countries opening their borders to more finished products from the West. The devil is in the details and if this is a continuation of Africa exporting raw products while importing transformed products, then nothing really changes. Time will tell.

Furthermore, in many cases, subsidies to Western farmers have produced food surpluses that would otherwise be non-competitive. This surplus food, through such programs as the U.S. PL 480 Food for Peace Program and the World Food Program (WFP), is dumped into Africa and other developing countries at below market prices. While of value for drought relief and famine caused by civil wars, needless food dumping puts small and commercial farmers out of business unnecessarily. For instance, rather than dumping cheap American/European subsidized grains/food into Sub-Saharan Africa, it is preferable to help Africa feed Africa, such as by buying maize from South Africa to make up for food shortages during drought in southern Africa (see Chapter 11, Section 11.8.8, Food Aid and Impacts on Grain Production in Southern Africa), or by allowing the

sustainable harvesting of Kenya's wildlife on ranches to feed refugees in the Horn of Africa (see Chapter 11, Section 11.8.3.1, "Food for Peace" or "food for poverty", Western donor impacts on food production and wildlife management in Laikipia, Kenya). This encourages the subcontinent to continue the development of commercial agriculture to feed itself. Unnecessary external food aid shuts down agriculture. Unnecessary food dumping is not only a disincentive to grow food, but can be a disincentive to use costly agricultural inputs (e.g., fertilizers and pesticides), resulting in soil "mining", decreased production capacity, expansion into marginal areas and ultimately, deterioration of the natural resource base. The end result is short-term gains in favor of long-term declines in production capacity and biodiversity in order to maintain their income/buying power as currencies devalue and world commodity prices fall because of Structural Adjustment Policies.

Foreign aid, subsidies, structural adjustment and debt relief are all neo-colonial tools of the West to create welfare states on the African continent. We know in America, that once on welfare, it is tough to break out of this mold; it is addictive. During the Cold War, these tools of dependency were used to keep the Russians and Chinese out of Sub-Saharan Africa and to obtain critical votes in the UN. In some cases, as in Zaire (today's Democratic Republic of Congo), they were used to obtain staging grounds by the West to battle the Eastern Bloc on the African continent. The Super-Powers were the "Kings, Queens and Knights", while the people of Africa were the "Pawns" who suffered the consequences.

With the closing of the Cold War one would have thought that the West would want to help Sub-Saharan Africa, one of the resource richest subcontinents in the World while being the poorest, evolve beyond subsistence and mono-culture economies. This was not the case.

The West and the materialistic lifestyle it has created, continues to depend on cheap raw materials for its industrial complex. What struck the principal author while visiting the USA in June 2003 was how American lifestyles had changed since the 1950s. In the past, during the heat of the summer, houses were designed with screen porches, so people could literally sleep out-of-doors, while being protected from mosquitoes. Cross-ventilation and shade trees helped keep houses cool. Fireplaces were commonly used to heat homes, not just for decoration as today. Today, architectural design has changed all buildings to “closed living” conditions. Windows are not meant to be opened other than for brief periods of the year. Central heating in the winter and central air-conditioning in the summer are used in climate controlled environments, not only in the home, but the workplace and shopping malls, and where fireplaces are more for decoration and atmosphere than warmth. This lifestyle requires cheap energy. Here in South Africa, we must wear our winter coats in both our homes and workplace, while using mobile “spot” heaters to warm ourselves, or among the poor - air polluting coal.

Thus, these neo-colonial tools (subsidies, tariffs, quotas, food dumping, structural adjustment, foreign aid and debt relief) are still used to manipulate economies to allow access by the West to cheap resources on the African continent, from petroleum to COLTAN used in microchips, to coffee, cacao and timber; raw resources needed by the West to stimulate its consumer economies and supply the demands of its citizens (see Chapter 13 for details), while assuring Western farmers continue producing food, regardless of the cost.

The net result, even in 2008, is resource plundering, food dependency, spiraling poverty and low educational levels that are linked to the HIV/AIDS pandemic, loss of biodiversity, habitat degradation and poor governance. Governments living on international welfare tend to be more responsive to donors and IFIs than their

citizenry, since that is where their “bread and butter” comes from; Euros and U.S. dollars and not local taxes. The political elite, from Africa and the West, the Beltway Bandits and the multi-nationals, score big time at the expense of the masses.

Government-to-government loans do not make sense, since most of Africa does not have enough of a tax base to allow these loans to ever be paid off. In addition, such loans will not create economies that must be linked to creating enabling environments that allow the private sector to compete in a global market place. Initially, this may require some protection until emerging industries become competitive.

The next chapter will outline in some detail the traditional role of the Western private sector in Sub-Saharan Africa and innovative initiatives, such as AGOA and NEPAD, which have the potential to create a partnership with the West, instead of the current “Master-Servant” relationship that is not sustainable. If the West wishes to not only access Africa’s rich resources, but also access the wonders of its charismatic mega-fauna and unique cultures, then this is the direction we must all be moving towards as a global community. It will also help create a middleclass and related benefits; accountable governments, educated and healthy people able to participate in a global economy, as well as declining HIV/AIDS rates, among others.

African governments will be required, with initial help from the West in foreign aid that subsidizes health and education (see Chapter 11, Section 11.13, AREAS WHERE FOREIGN AID CAN MAKE A DIFFERENCE – EDUCATION AND HEALTH), until Sub-Saharan Africa’s tax base is large enough to support these areas of social welfare on their own in order to produce productive members of society that can fit into a global economy.

America and Europe should be flexible enough to negotiate the lifting of certain subsides where Sub-Saharan Africa has a comparative advantage. America and Europe need to export their technologies to Africa and, along with African countries, find incentives (e.g., low interest loans or even grants) to attract foreign investment to jumpstart the transformation of Africa's raw products on the continent, leading to industrialization and urbanization where the majority of job opportunities will be in 50 years. Industrialization may be considered a form of diversification. The developing world, including Sub-Saharan Africa, may have to consider the creation of more "OPEC" type bodies to control the availability and negotiate prices of unique or rare raw materials, and even products transformed in Africa, with the developed world.

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Chapter 13

13.0 THE CURRENT AND FUTURE ROLE OF THE PRIVATE SECTOR IN SUB-SAHARAN AFRICA, RESOURCES WARS OR NEPAD?

“Behind rhetoric about self-determination, U.S. and European powers have used aid to compete with one another through colonial and neo-colonial systems. Trade and investment wars have gone on in the name of a super-project of social engineering called ‘development’ ” (Sogge, 2002).

The five pillars of American global sway in the 20th century include: “The international reach of U.S. investment banking, the emerging giantism of the military-industrial complex, the ballooning of the CIA and kindred intelligence operations, the drive for U.S. control of global oil supplies, and a close alliance with Britain and the English-speaking community” (Phillips, 2004).

“America’s Africa policy is morally bankrupt. Its commercially-influenced policy has directly promoted ethnic rivalries and some of the worst bloodshed of the 20th century. U.S. military and intelligence involvement in Africa, far from creating a sanguine and stable environment for a ‘new world order,’ has taken the continent back to another era – namely the ‘old world order’ of Western tutelage, tribal preferences, commercial chicanery and continued under-development...human rights means very little in the new world order crafted by military and economic planners in Washington. Only maximum profits engendered by unhindered access to raw materials dictate the foreign policies of Washington and its allies in London and Ottawa...America’s mercenary-influenced African foreign policy has dealt a severe blow to its traditional support for human rights” (Madsen, 1999).

This is both a global war pitting France against America and its allies, as well as an intra-continental war in which American and French proxies are used to fight

their battles where the victors reap the benefits to the detriment of Africa and Africans.

“This is like a guy who is falling from the Empire State Building who reassures his friend on the 20th floor: ‘Cool it, man. No crisis yet.’ We have already pushed Africa off the Empire State Building. But it hasn’t hit the pavement yet” (Jared Diamond, University of California *In: Rosenblum & Williamson, 1990*).

Weaknesses in global governance

“have contributed to the uneven social and economic impact of globalization. There are two main channels through which this has happened. The first is the creation of a system of rules governing the global economy that has been prejudicial to the interests of most developing countries, especially the poor within them. The second is the failure to put in place a coherent set of international economic (environmental) and social policies to achieve a pattern of globalization that benefits all people” (ILO, 2004).

The irony of the African continent is that one of the resource richest continents in the world is among the poorest and most backwards. One must ask why, but one must realize that this dichotomy between the extremes of rich and poor, in not only Africa, but also the Developing World in general, could jeopardize the idyllic quality of life of the Western Developed World. The West must come to realize, that as the largest consumer of natural resources, it cannot consume them at the expense of the rest of the World.

“But I also have a practical view, which derives from seeing people struggle to survive by exploiting the only resources available to them – namely, the natural world around them. Aiding their struggle while halting the destruction of those resources is humanity’s greatest challenge for the next century. It can be done, but only if the different needs of rich and poor countries are acknowledged. It will fail if the richer nations try to impose

solutions that effectively freeze the citizens of the less-developed nations in permanent poverty” (Leakey & Lewin, 1995).

This chapter will discuss the current and future role of the Western private sector and how they impact Africa’s economies and natural resources.

Aid agencies miss the point when they judge the rich world's rescue plans for Africa in terms of aid and debt relief. Africa's needs are on a far greater scale than the extra \$6 billion⁴⁹⁸ a year that the G-8 (G-7⁴⁹⁹ + Russia) governments plan to assign to Africa out of the \$12 billion increase pledged at the United Nations Conference on Finance for Development in Monterrey (Mexico). The total combined annual economic output of the 48 African (Sub-Saharan) countries is US\$ 300 billion, which is roughly the same as Argentina, with a human population of only 30 million compared with Africa's population of 818 million. Africa receives less than 1% of global Foreign Direct Investment (FDI) (see Section 13.13.5, Foreign Direct Investment in Sub-Saharan Africa). Aid flows are actually declining in real terms, having descended to less than half their level of two decades ago (Hampshire, 2002) (see Chapter 11, Section 11.7.1 Foreign Aid as Portion of Donor Country GNP).

To halve African poverty by 2015 in line with the UN Millennium Summit's goal, the economies of Sub-Saharan Africa will have to grow between 7% and 8% a year in real terms (World Bank, 2000; Hampshire, 2002), well above their average of a little over 2% from 1991 to 1997. This is a tall order for a continent containing most of the poorest countries in the world, the world's lowest life expectancy, the highest child mortality rates and an HIV/AIDS epidemic (Hampshire, 2002).

⁴⁹⁸Note in 2002 was US\$ 17.2 billion (see Chapter 11, Section 11.6.7, Foreign Aid and Puppet Governments – “Donor Democracy”, Table 11.4: Official 2002 development assistance (ODA = foreign aid) as a percentage of all investment inflows to Sub-Saharan Africa

⁴⁹⁹G7 consists of France, United States, Britain, Germany, Japan, Italy and Canada.

“The way to Africa's economic salvation is to build confidence in its future as a place where it is both safe and profitable to invest, persuading investors to disregard generalizations and seize the opportunities that individual countries and sectors offer” (Hampshire, 2002).

As discussed in Chapters 11 and 12, food aid and development aid strengthen the institutions that prevent progress, while weakening the institutions of the Third World, which could bring true prosperity. Aid increases the role of government and bureaucracy in the economic life of the Third World, while minimizing the role of markets and private entrepreneurship. One way of aiding Third World nations is through true “free-trade”, maybe best called “fair-trade”, lowering import barriers by the First World, allowing the Third World private sector easier access to Western markets. This will result in the opportunity to develop new industries or expand old ones. Commercial intercourse with the West, has transformed economic life in the Far East, South-East Asia, parts of Africa and Latin America (Majewski, 2002).

“It must be emphasized that free-trade alone will not solve all the problems of Third World poverty. Free-trade only increases the opportunities of the less developed nations. It will not eliminate the shackles of government regulation and intervention that dominate Third World economies. That task can only be done by the people of the Third World themselves. Yet, eliminating foreign aid and instituting free-trade will at least encourage Third World peoples to develop institutions such as private property rights and free-markets which will lead to growth and prosperity” (Majewski, 2002).

“In most of these countries - I'm thinking of Africa - people are not developing economically because they're not being allowed to. They're being oppressed politically. If you look at the development that's taken place in Asia in the past 15 or 20 years, none of that can be attributed to foreign aid. It's all investment; it all came about through change in government policies that allowed people to invest their money. I had a friend who had a business in Nairobi

a number of years ago who said he wanted to keep the business small because if you stuck your head up too high they'd chop it off. The President of Kenya (Moi) basically stole most of the successful businesses in the country, and now owns them. That's not the kind of policy that's going to foster large economic growth.⁵⁰⁰ And if the Asian model is going to apply to Africa, it's got to start slowly, and it has to start with good government. And to a certain extent, NGOs and aid organizations in these countries now help fortify a lot of bad governments" (Might Magazine, 2002).

13.1 CURRENT STATE OF AFRICAN ECONOMIES

Since Africa is still largely an agrarian region, falling agricultural productivity affects all other sectors of the economy. As discussed in Chapter 5, about 67% (2/3rds) of the labor force is employed in agriculture and 70% of the population lives in rural areas. Agricultural exports make up about 33% (1/3rd) of the total economic output and of total exports (Martin & O'Meara, 1995).

Over the last 30-40 years, agriculture and food production has grown more slowly than the population. Low and declining levels of domestic food production have been offset only partially by rapidly rising food imports. Africa has become the largest per capita importer of food globally and the largest per capita recipient of food aid. Average daily caloric intake, as a measure of well-being, was around 90-93% of minimal daily requirements between 1985 and 1995; 12-14% below less-developed countries (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*) (see Chapter 5, Section 5.3.3, Food Security in Africa and Section 5.4, HUNGER LINKED TO POVERTY).

⁵⁰⁰ Economic growth is the annual percentage rate change (from year to year) in a nation's "real" (adjusted to remove the effects of inflation) gross domestic product (real GDP).

Agricultural exports have stagnated or declined in most African countries (e.g. coffee, cocoa, cotton, groundnuts and timber). The proportion of global exports from Africa shrank from 2.5% in 1970 to 1.2% by the early 1990s. Africa's share of the world's primary commodity market has fallen from 7% to 3% over the past two decades (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*). The World Bank (2005) estimates that Africa's share of world exports has dropped from 3.5% in 1970 to less than 2.0% in 2003. If South Africa is left out, the cumulative trade losses between 1970 and 1997 were 120% of the GDP (Guest, 2004). Since most African countries depend on one to three export commodities, whose production is declining. This has resulted in a decline in foreign exchange and a reduced capacity to import needed goods (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*). From 1980 to 1993, imports to France from Sub-Saharan Africa (SSA) dropped from 10.8 to 5.3% of all imports, and exports from France to SSA dropped respectively from 13.5% to 6.9% of all exports (Huliaras, 2002) (see Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA).

The per capita GNP or Gross National Income (GNI)⁵⁰¹ in Sub-Saharan Africa has actually declined by 0.2% between 1990 and 2001, while life expectancy has decreased and people living in poverty have increased (Ignatius, 2003). Sub-Saharan Africa currently has 11% of the world's population, but only 1% of global trade. Since the 1970s, deteriorating terms of trade have cost Africa more than seven times the amount it has gained in development aid (Palmer & Kline, 2003) (see Chapter 12, Section 12.3.4.4, Trade and structural adjustment policies (SAP), Declining "Terms Of Trade" Associated With Structural Adjustment).

⁵⁰¹ Previous terminology

Gross National Product (GNP)

per capita GNP

Source: World Bank (2004)

New terminology

Gross National Income (GNI)

per capita GNI

Some countries have seen growth in their GDP⁵⁰² in recent times (Commission for Africa, 2005). What this means is that,

“while many African countries have historically managed to generate periods of rapid growth, few have been able to sustain it for long periods at the levels needed... (a) 5% annual growth is needed simply to keep the number of poor from rising and halving severe poverty by 2015 will require annual growth of more than 7% along with a more equitable distribution of income... A highly unequal distribution of income significantly reduces the positive impact of growth on poverty. Inequality is particularly high in Lesotho, Botswana, Sierra Leone, the Central African Republic, Swaziland and South Africa. But it is most severe in Namibia, which has one of the highest levels of inequality in the world. Relatively equal distributions of income in Ghana and Uganda have meant that growth in these countries has been linked more strongly to poverty reduction... The critical challenge is to ensure poor people are able to participate in these opportunities. That requires government action. Strengthening the assets of poor people – including their human capital, such as health and skills, physical capital, such as land and property, access to finance and their natural environment – enables them to participate more effectively in markets, while the economic, legal and governance environments shape the opportunities open to them” (Commission for Africa, 2005).

However, Sub-Saharan Africa is also the only region where the annual growth of per capita GDP or Gross Domestic Product⁵⁰³ has been negative, at -1.0% between 1975 – 1999, compared with 6.0% for East Asia and the Pacific and 2.3% for South Asia (Roman, 2003). Similarly, according to Sogge (2002), between 1960 and 1980 per capita GDP increased by 36%, while between 1980 and 1998, during the period of structural adjustment (free-market

⁵⁰² For an explanation of GDP versus GNP/GNI, see Footnote 48, Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA.

⁵⁰³ Of Africa’s ten richest countries, with a per capita GDP over US\$ 3,500, nine lie partly or entirely in temperate zones: Egypt, Libya, Tunisia, Algeria and Morocco north of Sub-Saharan Africa, as well as Swaziland, South Africa, Botswana and Namibia in Sub-Saharan Africa, with Gabon being the continent’s only truly tropical country making the list (Diamond, 2005).

fundamentalism), the per capita GDP fell by 15% in SSA. Zack-Williams (2002 *In: Zack-Williams, Frost & Thomson, 2002*) estimates that Sub-Saharan Africa's per capita GDP fell from US\$ 671 in 1975 to US\$ 245 by 1997 [see Chapter 12, Section 12.3.4.4, Trade and structural adjustment policies (SAP)]. This implies that, among other things, the human population is growing faster than the GDP (Alemayehu, 2000; Sachs, 2005), making it difficult for Sub-Saharan African economies to improve the standard of living of the average family. To put it in simple terms, based on defining poverty as living on less than US\$ 1/day,⁵⁰⁴ unimaginable to most Westerners, unless there are major changes in the status quo of Sub-Saharan Africa's economies per capita, the population living in poverty will only increase,

“46.4% of the population in Sub-Saharan Africa were living in households with incomes/person of less than \$US 1/day in 2001. This compared to 31.3% in South Asia, 14.9% in East Asia, 9.5% in Latin America and the Caribbean, 3.6% in Eastern Europe and Central Asia, 2.4% in Middle East and North Africa. In terms of absolute numbers, India had more poor people than all Sub-Saharan African countries put together (358.6 million compared to 312.7 million). However, it is projected that by 2015, Sub-Saharan Africa will have the largest number of poor people (366 million below \$US 1/day), and will be the region with the highest proportion of poor people (42.3%)” (Commission for Africa, 2005).

In 1981, SSA had approximately 150 million extremely poor. The majority of countries in SSA are classified as having extreme poverty; that is at least 25% of the households living on less than US\$ 1/day (Sachs, 2005). This chapter will delve into changes that could reverse this decline in quality of live on the subcontinent.

⁵⁰⁴ World Bank definitions include “Extreme Poor” living on less than US\$ 1/day measured at purchasing power parity and “Moderately Poor” living on US\$ 1-2/day (Sachs, 2005).

Since Africa is the least developed region of the world, it imports the bulk of its machinery and equipment used in local production, as well as a substantial portion of its consumer goods. Only 10% of Africa's exports are manufactured goods. Africa has actually experienced a de-industrialization; experiencing a decline in total manufacturing output and a decline or stagnation in the proportion of the labor force in manufacturing (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*) [see Chapter 12, Section 12.3.4.4, Trade and structural adjustment policies (SAP)].

In Africa's "industrial" sectors, only mining and petroleum production continued to grow over the past two decades. Part of the problem has been the Third World's, including Africa's compulsory economic liberalism in the 19th and 20th centuries. This is a major element in explaining the delay in industrialization, or in the case of India, de-industrialization in the 19th century, where Great Britain exported raw cotton from India for its industry, while shutting down India's textile industry through protectionist measures, as well as shipbuilding, steel, locomotives and other industries through "free-market" principles (Chomsky, 1999) (see Chapter 12, Section 12.1, COMMODITY DEPENDENT, AFRICAN GOVERNMENTS FALL IN-DEBT – SPIDER WEB OF THE WORLD BANK AND IMF).

As discussed, African economies are very small and based on the production and export of a handful of primary commodities with minimal industrial processing. This size and dependency is a result of colonial domination and a world economic order, which has severely constrained the growth opportunities for the "last and least" seeking to develop. As a result, Africa is extremely vulnerable to external forces beyond its control, such as when global prices for the raw products, which it has to export, are low compared to the manufactured products from the West and increasingly from the East, which it must import. It is estimated that about

25% of the purchasing power⁵⁰⁵ of Sub-Saharan Africa exports was lost over the 1980s due to the global recession of the early 1980s. This resulted in new lows for African commodity (raw products) prices, with continued declines in prices for coffee and cocoa (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*) [see Chapter 12, Section 12.2.5, ILO Demands an End to Subsidies and Trade Barriers and Section 12.3.4.4, Trade and structural adjustment policies (SAP)].

Servicing Africa's debt is estimated to absorb more than 20% of all export earnings each year, which is four times higher than annual expenditures for health and education (see Chapter 12, Section 12.5, DEBT AND STRUCTURAL ADJUSTMENT POLICIES and Section 12.6, IMPACTS OF STRUCTURAL ADJUSTMENT ON SOCIAL WELFARE AND EMPLOYMENT). This problem is compounded by the highest rate of population growth in the world, a large percentage of the population coming into the work force (see Chapter 5, Section 5.9, OVER-POPULATION, SOIL DEGRADATION AND DECLINING AGRICULTURAL PRODUCTIVITY), combined with the highest HIV/AIDS rate in the world, averaging 3%/year. HIV/AIDS in the long-term will counter the high birth rate, but could devastate the productive portion of the population, leaving mainly non-working, under-aged youth and the elderly behind to fend for themselves (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*) (see Chapter 5, Section 5.8, HIV/AIDS DECLINING AGRICULTURAL PRODUCTION AND FOOD SECURITY IN SSA).

⁵⁰⁵ Purchasing power of money is measured by the quantity and quality of products and services it can buy, also called buying power.

This continues to place increasing pressures on Sub-Saharan Africa's already over-used land and natural resource base by a predominantly rural subsistence population, while in the cities there is tremendous competition for the few available jobs, with little opportunity for upward mobility. Tropical soils are very fragile [see Chapter 5, Section 5.5.2, Physical and Environmental Constraints to Overcoming Food Production in Sub-Saharan Africa (SSA)] and the pressures of rapid population growth and intensive economic exploitation are causing widespread ecological damage, and contributing to the reduced agricultural yields. Arable land per person is declining, as discussed in Chapter 5 (Section 5.9.1, Overpopulation, Land Scarcity and Decreasing Agricultural Production in Sub-Saharan Africa). Fallow periods are no longer sufficient to restore soil fertility (see Chapter 5, Section 5.9.3, Fallow Agriculture, Over-Population and Agricultural Production) and the costs of increasing yields by external inputs of fertilizers and pesticides versus the increase in yields, are not cost-effective in much of Sub-Saharan Africa as there are often other limiting factors to production, such as chemical and physical qualities of the soils, climate, economies of scale, under-training in the latest technologies, poor market transport, storage and processing infrastructure (see Chapter 5, Section 5.12.1.8, Infrastructure technology as an incentive to increased agricultural production). Factors such as drought, locusts, quelea, rodents and other pests often make it too risky for most subsistence farmers to purchase inputs (e.g., pesticides and fertilizers) without large subsidies, which African countries cannot afford (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*) and which structural adjustment policies (SAPs) have discouraged (see Chapter 12, Section 12.4.3, Declining Fertilizer Use in Sub-Saharan Africa).

Meanwhile, forest areas are being invaded across the continent, first for timber and charcoal and then for cultivation and grazing, while the opportunity for the forests to regenerate is nil (see Chapter 5, Section 5.6.1.1, Impacts of colonialism

on agriculture and pastoralism in the Sahel, Section 5.9.4, Forest Losses Linked to Over-Population and Agricultural Land Scarcity and Chapter 11, Section 11.7.7.2, Mismanagement, corruption and classified forests, Senegal). At the same time, growing numbers of people and livestock are being forced into more and more marginal areas, increasing erosion and desertification (Stryker & Ndegwa, 1995 *In: Martin & O'Meara, 1995*) (see Chapter 6, Section 6.1.4.7, Impacts on pastoralism and range ecology from increases of human and livestock populations in the 20th century). Very often civil wars and conflict result from a collision between traditional pastoralists moving south and itinerant farmers moving both north and south (see Chapter 5, Section 5.11, CONFLICT LINKED TO OVERPOPULATION AND DESERTIFICATION).

Where is Sub-Saharan Africa going economically and how can this seemingly hopeless situation be overcome? Economies should be driven by the private sector, while governments should play a regulatory role and create an enabling environment in which the private sector can operate. Up until now, Sub-Saharan African governments have tried to take on the role of both the private sector and government, as “player and referee” in controlling economies (see Chapter 12, Section 12.3.4.2, Structural adjustment and privatization of parastatals), or have been in cahoots with the private sector in exploiting African natural resources to their advantage, but to the disadvantage of the rural poor living among these resources, be they mineral, wildlife, timber or other [see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas and Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)].

The United Nations Draft Declaration on the Rights of Indigenous Peoples, presently under negotiation, will likely demand (see Chapter 11, Section 11.10.1, Foreign Aid for “Conservation”?):

“recognition of prior rights of indigenous peoples over lands and resources they have occupied and nurtured since time immemorial. The refusal or inability of indigenous peoples to take advantage of modern land titling processes, which do not recognize their indigenous land tenure systems and resource rights systems, should not be used as grounds for their dispossession in favor of other interests” (ILO, 2004).

However, as seen from case studies throughout this book, African governments currently declare ownership over both land and these natural resources and, in turn, use the multi-nationals and/or foreign companies to extract these resources and obtain added value on the international market, with little or none of the value going to rural people.

While a partnership with the international private sector is imperative, as will be described below, the private sector’s attitude towards Sub-Saharan Africa, in collusion with Western governments, was, and too often still is, short-term and exploitative with what appears to be explicit collaboration and backing by international donors and financial institutions. Perkins (2006) describes the inter-relationship between corporations, banks, governments and related multilateral financial institutions and bilateral donors as “corporatocracy”, in which a global empire is developing, run and controlled by multi-nationals. Since the first Arab and European slavers entered Africa, the relationship has been one of plunder, Africa’s rich resources being mined off the continent with little or no reinvestment in the infrastructure or the people. Like America, the best developed countries in Sub-Saharan Africa are or were those in southern Africa, where the white settlers came to stay and reinvested the wealth they generated back into the

infrastructure of the country, but (unfortunately) too often not back into its people, though this is changing.

13.2 INSECURITY AMONG THE PRIVATE SECTOR

Often the only way the private sector survives in Sub-Saharan Africa is through under-the-table payoffs to corrupt government officials linked to a system of patronage and clientelism, which is how many poorly paid bureaucrats with large extended families earn the majority of their salaries (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, The Big Man and “Cosmetic Democracy”). With little security and an uncertain future, even the private sector in Africa tends to take a subsistence approach to business “living for today”. This is very disconcerting when one speaks of natural resources such as wildlife, forests and fishes; where because of the insecurity, there is a tendency to “mine” them as though they were non-renewable.

As one professional hunter said (Anon., *pers. comm.*),⁵⁰⁶ “In Africa’s safari industry you have to make your investment back in the first 3 years. Then you may get a few years of net profits and only God knows when it will end”. When the principal author first hunted in Tanzania, safari operator Franz Wengert (*pers. comm.*)⁵⁰⁷ sat him down and in exasperation explained, “I used to hunt, but today, I spend most of my time fighting the government trying to keep what I have”. Here was a man who for 22 years successfully ran and operated a safari hunting and ecotourism company. He started from scratch and built it into a company that generated US\$ 600,000/year for the Tanzanian government. He operated, managed and marketed up to 13 hunting blocks at a time, amounting to 2,000 km²/block at a minimum. He averaged 40-60 hunts per year or somewhere between 60-80

⁵⁰⁶ ANON (2001). Anonymous to protect the professional hunter.

⁵⁰⁷ Franz Wengert (1991). Former owner of Wengert-Windrose Safaris, Arusha, Tanzania. Now residing in the Dominican Republic. franzwengert@web.de.

clients/year. Yet, for a small payoff to a mid-level bureaucrat, the Tanzanian government was prepared to give away his hunting blocks. He was basically told to pay his fees on a national holiday, which was impossible, and this failure of timely payment used to confiscate two of his hunting blocks. The principal author prepared a document with Mr. Wengert (Wengert, 1998), which he used through the Lawyers Environmental Action Team (LEAT) (Majamba, 2001) to take the Tanzania Wildlife Division to court over this trumped up excuse on the timely payment of government fees as a basis to confiscate some of his blocks. He won the case, the High Court of Tanzania declaring the action by the Director of Wildlife a nullity due to a clear abuse of powers vested in the Director of wildlife by the law (Majamba, 2001). LEAT also helped safari operator George Alexiou (now deceased) to win a similar case, while safari operator Raoul Ramoni was also obliged to take the Wildlife Division to court, winning a case against the confiscation of one of his hunting blocks. It is said that the then Wildlife Director, Mr. Muhidin Ndolanga, retired as one of the richest men in the history of game management, globally.

Until the private sector has security in Sub-Saharan Africa, be it a local community, individual or multi-national corporation, there will be a tendency to “mine” the subcontinent’s resources. Much of the Western private sector will be reluctant to invest in the continent or, like carpet baggers after the American Civil war going into the impoverished South, will only come to milk the continent, with little reinvestment into its development. This is a good summary of the situation at the beginning of the 21st century on the African subcontinent, other than maybe South Africa.

13.3 CAPITALISM WITHOUT A CONSCIENCE

The U.S. Defense Science Board concluded in a

“1997 report ‘Historical data show a strong correlation between U.S. involvement in international situations and an increase in terrorist attacks against the United States’ ” (Phillips, 2004).

As the world enters the 21st century, the new religion appears to be materialism, regardless of the consequences to nature or fellow man.

“ ‘The Bank and IMF are instruments of a few rich governments, which hold a majority of the dollar-based votes, and would rather pretend that all is well than ask their tax payers to address the urgent problems of the poor...The IMF has no business trying to run dozens of poor countries...its policy recommendations have left Africa every bit as dependent on primary commodities as it was 29 years ago’ ” (Jeffery Sachs⁵⁰⁸ In: Legum, 2002).

Things are not okay and 911⁵⁰⁹ should have been a wake-up call to the citizens of the West. Given media bias, this is not evident.

“ ‘When the ruler of a country fails to apportion wealth to those in need, poverty becomes prevalent. Poverty being prevalent, theft becomes prevalent, weapons become prevalent. When weapons become prevalent killing and maiming become prevalent, lying becomes prevalent...slander...sexual infidelity...abuse and frivolity...covetousness and jealousy...wrong understanding becomes prevalent’ ” (The Buddha 545 BC In: Legum 2002).

⁵⁰⁸ Jeffery Sachs, Director of the Centre for International Development at Harvard, from a speech at the World Bank in April 2000 and a Financial Times article of September 26, 2000. By 2005, Director of the Earth Institute, Columbia University and Special Advisor to UN Secretary-General Kofi Annan on the Millennium Development Goals.

⁵⁰⁹ September 11, 2001, planes crashed into World Trade Center, believed linked to Muslim fundamentalist group, *al-Qaeda* headed by Osama Bin Laden.

At the beginning of the 21st century, this applies to much of the failed states on the African subcontinent who have helped improve Western prosperity at the expense of the African people through globalization, and even to South Africa as a legacy of Apartheid and the poverty and backwardness, it created.

As early as the 1960s, René Dumont (1966) saw the growing gap between the rich and the poor in the world as a “dangerous international threat” to “world peace”. This gap has increased significantly since the 1960s and can be clearly expressed by the growing difference in GDP’s between the 20 richest and poorest countries. In 1960-62 the per capita GDP in the 20 poorest countries was US\$ 212 versus 11,417 in the 20 richest countries as opposed to 2000-02 where the figures are respectively, US\$ 267 versus 32,339 (ILO, 2004). Bodansky (2001) states that

“with destitution and misery growing throughout the developing world, the Islamists ‘hearts and minds’ campaigns are proving extremely successful in building solid and resilient popular bases, encouraging local youth to join the jihadist forces – though the leaders of this Islamic radicalism tend to come from the affluent and privileged segment of society, are highly educated and relatively Westernized”.

Bond (2002) quotes from the New Partnership for Africa’s Development (NEPAD) that the continual marginalization of Africa from globalization and social exclusion for the majority of the people constitutes a serious threat to global stability, but believes this is rhetoric that does not match what is happening on the ground, the continual application of structural adjustment policies and thus, marginalization.

In the December 11, 2001, *Washington Post* an editorial by African American Susan Rice, former Under Secretary of State for African Affairs from 1997-2001 (Rice, 2001), explained:

“ ...Africa is an incubator for the foot soldiers of terrorism. Its poor, young disaffected, unhealthy and under-educated populations often have no stake in government or faith in the future. They harbor an easily exploitable discontent with the status quo. For such people in such places, nihilism,⁵¹⁰ is as natural a response to their circumstances as self-help.”...

It is interesting that this comes from what Madsen (1999) calls an architect of the African Crisis Response Initiative (ACRI), which appears to be a wedge into American hegemony in Africa (see Section 13.8.2, American Imperialism in Sub-Saharan Africa, a Struggle for Control of Francophone Africa), regardless of the cost to humanity on the continent. Is it possible she wishes to repent for past sins?

In a similar article in the South African *Farmers Weekly*, well-known conservationist and founder of Holistic Resource Management fame, Alan Savory, living in New Mexico, USA, who was also a top guerrilla warfare commander in the Southern Rhodesian (Zimbabwe) military for over 20 years and founded the “tracker unit” which became the famed elite Selous Scouts - wrote concerning 911 and the war on terrorism that:

“...The President has called it a war and pledged to win it. This pledge, while understandable because of prevailing emotions, is about as meaningful as the many pledges to win the war against drugs. America and the Western nations, whose way of life is under attack, will need far deeper understanding to bring about peace and to safeguard what we value in our way of life. This is not a new form of warfare – it is one of the oldest forms of welfare. And due to technological advances, it is capable of wreaking unbelievable havoc...I see in America a repeat of what I lived through. Our strength is our greatest weakness. What do I mean? In Rhodesia we had an extremely capable and efficient army for bush warfare. We never lost a single encounter or battle no matter

⁵¹⁰ Nihilism: Conditions in a society are so bad that destruction is desirable.

what the odds, but that guaranteed we would lose the war. I say this because these situations are not wars requiring military solutions but situations requiring civilian policies that deal with the root cause of the people's frustrations and suffering. When all of your attention and funding is focused on revenge, there is little room for looking deeper...American leaders would be wise not to treat this as a war but rather a serious wakeup call to look at an extremely broad and comprehensive strategy involving our foreign and domestic policies and our education and business systems...If America is to provide the leadership needed at this moment, we must try to understand how and why the bin Ladens of the world can have such a pool of angry young men who are prepared to give their lives" (Savory, 2001).

We need to:

- "Heed the cries of people displaced by massive dam construction in India and Africa, or the bulk of the Mexican population whose lives are daily becoming worse under the North American Free-Trade Agreement (NAFTA).
- Realize that we cannot prop up the despots to ensure access to oil while hundreds of thousands under these despots live lives of slow starvation (e.g., Nigeria, Angola, the Democratic Republic of Congo, Congo Brazzaville, etc.).
- Understand that we cannot call on people in poor countries to be good capitalists and then go to war against them for supplying us with drugs our citizens seek.
- Understand that when we ban chemicals that are known to be damaging to humans, we should not allow multinational corporations to increase their manufacture and sale in the Third World countries so that we can profit (e.g., banned pesticides).
- Recognize that we cannot take thousands of years of careful nurturing of genetic material by simple people and patent the genes for the profits of our corporations and their shareholders.

It is not democracy that is under attack but rather certain aspects of our lives that others see as causing their suffering. It is in our own enlightened self-interest to look at our policies and business activities and the effect these are having on the world's natural resources and communities....To win peace, the President's advisors should include men and women who understand the effects on millions of ordinary peace-loving people of our agriculture, trade and arms sales, and other policies as well as the effects of multinational corporations" (Savory, 2001).

“Poverty does not create terrorists – that’s a falsehood and a smear. However, theft of wealth and development denied inevitably seeds resentment, the spark terror’s masters know how to stroke. Corruption and stolen opportunity stalk the streets and hard corners where terrorists recruit. Globalization if properly applied can be a means of relieving mass endemic poverty and a key to defeating terrorism” (Bay, 2002).

“It might be expected that President Bush’s meeting today with Presidents Daniel Arap Moi of Kenya and Meles Zenawi of Ethiopia would be dominated by the war on terrorism. East Africa has been a center of activity for al-Qaeda for some time...Terrorist groups have taken root in the region in part because of the misrule inflicted on nearly 100 million people by these two presidents” (The Washington Post, 2002).

Legum (2002) best sums it up in two quotes:

1. A letter from past Russian Premier Mikhail Gorbachev to Past President George Bush Sr. (current President George W. Bush’s father) entitled: *“The World Doesn’t Want to be American:”*

“ ‘....It is time for the America’s electorate to be told the blunt truth: that the present situation...is not tenable as long as an enormous portion of the world live in abject poverty, degradation and backwardness...Instead of seeing an increase in U.S. security, the end of the Cold War has seen a decline. Should the United States persist in its policies, the international situation will continue to deteriorate’ ” (Legum, 2002)

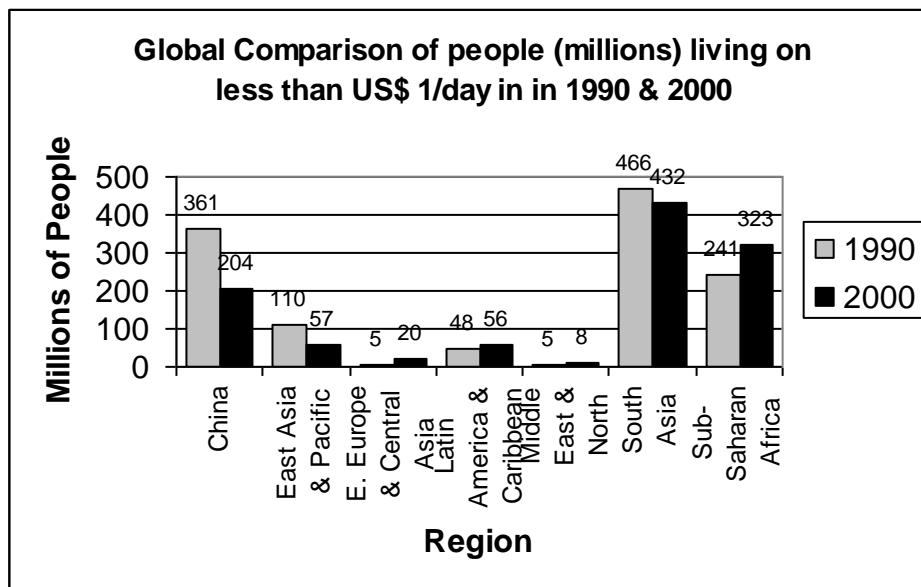
2. “ ‘...Either start caring about the fate of everyone on this planet or be prepared for a slippery slope towards violence that will eventually dominate our daily lives;’ ” (Rabbi Lerner In: Legum, 2002).

Like it or not, America’s global domination of the world economically, culturally, politically, militarily and technologically causes America to be seen globally as

the “world’s dominant minority”, resulting in backlashes no different than the Hutu against the Tutsi (Chua 2003) (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, The Big Man and “Cosmetic Democracy”; Section 11.6.4, Dangers of Economically Repressed Majority Being Handed Political Power through One Man One Vote Elections and Chapter 13, Section 13.8.6, Former Cold War allies vying for power in the Great Lakes Region). The INTERNET and CNN, outcomes of globalization, fuel this growing discontent as the poor of the developing world become aware (Chua, 2003) of what they do not have, people often living in resource rich countries in which this wealth is squandered, often in collusion with Western governments and multi-nationals. This disproportionate distribution of wealth today has resulted in the richest 1% of the world’s population owning as much as the poorest 57%. Half the world’s population live on less than US\$ 2/day, and more than one billion (about 17% of the World’s population of 6.1-6.3 billion) on less than US\$ 1/day (Chua, 2003; World Economic Forum, 2004), unable to escape from the “poverty trap;” too poor to save for the future and thus unable to escape economic poverty and often consequential environmental degradation (depletion of natural capital) (Sachs, 2005), while the top 20% of those living in high income countries account for 86% of the world’s private consumption (Chua, 2003). While in 1820 the biggest gap in per capita income between the richest country, the United Kingdom (about US\$ 1,600 per capita GDP) and the poorest region, Africa (about US\$ 400 per capita GDP) was only 4/1 by 1998, this gap had increased to 20/1 between the richest country, the United States (about US\$ 26-27,000 per capita GDP) and Africa (US\$ 1,300 per capita GDP) (Sachs, 2005). As discussed in Chapter 5 (see Section 5.4, HUNGER LINKED TO POVERTY), half of Sub-Saharan Africa’s 600 million people live on less than US\$ 1/day (World Economic Forum, 2004) 46.4% in 2001 according to the Commission for Africa (2005), and roughly half lack access to clean water (World Economic Forum, 2004) (see Chapter 11, Section 11.13.2.4, Safe drinking water in Africa as a health indicator). Other than

South Asia, Sub-Saharan Africa's inhabitants may be considered among the poorest in the world (ILO, 2004) (Figure 13.1).

With a recent average economic growth of 3.3% a year in Africa, few countries will achieve the poverty reduction goal for 2015; the number of the poor projected to increase as populations rise (World Economic Forum, 2004).



Source: Redrawn with permission, Copyright © International Labor Organization (ILO) (2004).

Figure 13.1: Global comparison of people living on less than a US\$ 1/day in 1990 and 2000 (in millions)

Meanwhile in the 1990s, where terror lurked around the street corner, two billion people, particularly in Sub-Saharan Africa, the Middle East and the former Soviet Union, have not benefited from globalization, leading to greater inequality, often with a few elites within these countries taking advantage of economic opportunities stemming from globalization (Chua, 2003), at the expense of the majority who remain poor or become poorer and more frustrated, eventually de-linking themselves from any hope of civil society giving them an opportunity. This is mainly due to the extraction of raw resources with a minimal investment, exchange of technologies or stimulation of national and regional economies. In

fact, Sub-Saharan African is a region of under-investment by the international private sector World Economic Forum (2004) (see Chapter 11, Section 11.6.7, Foreign Aid and Puppet Governments – “Donor Democracy” and Section 13.13.5, Foreign Direct Investment in Sub-Saharan Africa).

These hopeless masses are the majority recruits, the “World-Hutus” used as pawns by a fanatical elite minority (Muslim fundamentalists practicing “Political Islam”), no different than the minority educated Hutu elite using the poor uneducated Hutu majority in Rwanda, against the “World-Tutsi”, the United States and the West in general (see Section 13.8.6, Former Cold War allies vying for power in the Great Lakes Region). The World Trade Center was seen as the “High Temple of Capitalism”, housing thousands of highly paid “soldiers” fighting an economic war that forces 80% of mankind to live in poverty. America should not ignore the widespread hatred felt against it as no empire can successfully oppress other nations and cultures indefinitely (Chua, 2003) in order to maintain their lifestyles. Sachs (2005) believes that with only 4.5% of the world’s population, the neoconservative push for unilateralism and the creation of a global U.S. empire is dangerous, as its economy cannot sustain such attempts. Additionally, Sachs (2005) concludes that America has found, as with Iraq and Afghanistan, that it can conquer, but it cannot rule, being seen not as a liberator, but as an occupier, as a result of the rise in the political ideology of nationalism and self-determination throughout the 20th century.

The danger for America is a loss of democracy and the security that Americans have known for the last 150 years. In other words, our accumulation of wealth and lifestyles at the expense of the rest of the world has triggered a backlash – terrorism. Rather than trying to understand “why they hate us”, Americans are turning blindly to the flag and this blind faith in “America the Beautiful”, allowing evil in society to take advantage of misled patriotism to continue living

off the backs of the rest of the world through imperialist aggressions justified on the premise that they are protecting America, when in reality they are controlling the world's resources for America's multi-nationals. Norman Mailer (2003) is concerned that a reaction to terrorism in the U.S. has been a

“ ‘blind promiscuous flag waving patriotism,’ without asking why this happening to us is? In a country with collapsing moral values dominated by materialism, this form of patriotism ‘becomes the hand-maiden of totalitarianism,’ where the freedoms of democracy are slowly eroded away. The ‘country becomes the religion.’ We are asked to live in a state of religious fervor: Love America! Love it because America has become a substitute for religion. But to love your country indiscriminately means that critical distinctions begin to go. And democracy depends upon these distinctions”.

This risks the creation of an endless cycle of violence that will be visiting America's backyards, a phenomenon that up until now America has been insulated against. As the Hutu and Tutsi elite used and misled the masses to their own ends, so are the elite in America misleading their citizens about the real issues that helped to spawn “911”.

“An Africa with failing states and deep resentment can become a source of conflict which is not only internal but spreads across continents in international terrorism and crime. Cells of groups linked to al-Qaeda are thought to be in operation in Kenya, Ethiopia, Somalia and Sudan and terrorist attacks have already taken place in East Africa (August 7, 1998 U.S. Embassy bombings in Kenya and Tanzania)...(in) Africa's population of around 700 to 800 million, there are roughly 350 million Muslims, 400 million Christians and some 100 million followers of indigenous religions” (Commission for Africa, 2005).

It appears the mastermind of the July 2005 London subway bombings may have used southern Africa as an operational base (WJLA, 2005). Geographically, the Muslim religion dominates in a large part of Africa (Figure 13.2). AKL (2005)

estimates that 250,000,000 or 20% of the World's Muslim population live in Sub-Saharan Africa. Though traditionally home to the moderate and more tolerant Islamic Sufi sect, poverty, corruption and political alienation are contributing to the spread of radical Islam in Sub-Saharan Africa, such as in Somalia, Eritrea and Kenya, while Nigeria, with 60 million Muslims, has already seen Islamic law



Source: University of Texas (2006) with permission, Digital Library Services Division
University of Texas Libraries

Figure 13.2: Muslim Africa, 1987

“*Shari'a/Shariah/Sharia*” adopted in the north, often contributing to religious tensions and violence. As a result of hopelessness among many of the youth, Sub-Saharan Africa is serving as the feeding grounds for committed extremists from outside the region to move through and gain local support and assistance, even though the local people may or may not be the ones who are providing most of the foot-soldiers for extremism and terrorism. Africa is on its way to becoming the first Muslim continent (AKL, 2005).

In addition to terrorism, America and Europe are experiencing a major and, one could argue, uncontrollable immigration as the Third World abandons its homeland for these promised lands. This is epitomized in 2005, by 11,000 Sub-Saharan African lumpens trying to scale the razor wire fences in the Spanish enclaves of Ceuta and Melilla on Morocco's Mediterranean coast in hopes of gaining access to the mainland and a new life (Ham, 2005). The Spanish Canary Islands, another gateway into Europe, are also a major destination for West Africans, of which at least 32,000 were prepared to die in 2006, departing the West coast of Africa in unseaworthy boats, rather than remain on a subcontinent that offers them nothing but hopelessness and despair. In Senegal, there are many villages with only women, elderly and children. They have not heard from their husbands, brothers, fathers and sons in months, not knowing if they survived or drowned in their bid to attain Europe (Schlein, 2007a) and a better life, where remittances back home can make a difference in the survival of the family. Women and children are beginning to chance this perilous voyage (Tran, 2007).

This is resulting in a large and growing “South” in the “North”. This is resulting in major urban centers in the West generating stratified dead-end and precarious lives lower on the social ladder. In 1998, a child born in New York City stands a smaller chance of living to five or learning to read than a child born in Shanghai. In Marseille, France, there are North African slums where few policemen dare

venture. If a child survives to adulthood under such conditions, he/she is a prime candidate for terrorism or criminality since he/she will not be trained to integrate into mainstream society (Sogge, 2002). The November 2005 outbreak of violence (burning vehicles and schools) by the North and Sub-Saharan immigrants living in the *bidonvilles* of France is indicative of things to come if Africa does not develop.

The World's economic system has a lot to do with how we relate to each other (Legum, 2002). Unless capitalism develops a "conscience", the West must wake up and realize that its very existence and lifestyle is in jeopardy, and cannot continue to exist on the shoulders of and at the expense of the Developing World. Slavery in the "Deep South", American segregation and South African Apartheid, in which a few benefited off the backs of others, were not sustainable. In this world of global communications, the awareness that the materialistically dominated lifestyles of the West depend on living on the backs of the rest of the world, will also be unsustainable. We are truly a global society and our futures are too intertwined to ignore the plight of the majority poor in the rest of the world.

13.4 EXPROPRIATION OF NATURAL RESOURCES, IMPLICATIONS FOR REGIONAL AND NATIONAL SECURITY

There is increasing concern about the adequacy of the natural resource base of states in Sub-Saharan Africa. Much of the relative economic development in Sub-Saharan Africa is attributable to the exploitation of non-renewable resources, such as fossil fuels and metallic ores, or to non-sustainable rates of exploitation of renewable resources, such as forestry, fisheries, related water systems and agriculture. The increased demand for resources for local, national and export markets, as well as escalating competition for the control of natural resources,

have been a source of insecurity in the southern African region. Adding to this is the prospect of the recolonization of Africa's resources as a result of economic liberalization (Structural Adjustment) since the 1980s. Examples of this include the concession of territorial enclaves rich in mineral, forest and biodiversity resources to direct control of multinational corporations and Western NGOs [see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the "Dobi Dobi", More Parks and Protected Areas and Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)]. Recent research indicates that the lack of resources and environmental degradation are playing more prominent roles in factors contributing to destabilization on the continent. "Development", which adversely contributes to environmental change, may also cause instability (Van Wyk, 2000).

13.5 FAILURE TO DEVELOP GOOD GOVERNANCE IN MINERAL RICH COUNTRIES

"Lack of transparency encourages corruption, especially where politicians and officials are members of secret societies, which are common in Africa as in the rest of the world. This lack of openness is a particular problem where income – particularly that derived from oil, minerals and other high-value natural resources – is managed in a way which hides accounts from the public...All the evidence shows that oil, for example, usually enriches only the ruling elite. For the vast majority of the population mineral wealth often appears merely to increase corruption, poverty and political instability" (Commission for Africa, 2005).

Governments with large resource bases tend to be poor at developing state institutions, since revenues from mineral sales reduce the need to levy taxes and thus diminish the need for accountability to citizens. In turn, this revenue can be used to develop political patronage (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, The Big Man and "Cosmetic Democracy"), maintain power and enrich the political elite and their families, resulting in poor economic

performance and greater socio-economic inequalities (LeBillon, 2000; Reno, 2000 both *In: Cilliers & Dietrich, 2000*). In contrast, where small producers grow coffee or cocoa, or even plantation economies that need a lot of workers to harvest sisal, tea or rubber, very few people are needed to gather oil. Most African states that currently experience major internal strife are dependent on oil or other enclave economy mineral exports for revenues. They include Algeria (with 98% of foreign exchange earnings from oil exports), Angola (83% from oil), Nigeria (96% from oil), Sierra Leone (96% from titanium ore and diamonds), and the Democratic Republic of Congo (78% from copper and cobalt). Developments in Liberia, Sierra Leone and the Democratic Republic of Congo show that strongmen can seize control over small, economically valuable pieces of territory and use them as bases from which to compete for control over what remains of the state and its rich resources (Reno, 2000 *In: Cilliers & Dietrich, 2000*).

“The question begs to be asked whether the different results of UN operations in Angola and Mozambique – one failed, one successful – were at least in part related to the fact that Mozambique is rich in prawns and peanuts, while Angola is rich in diamonds” and oil (de Beer & Gamba, 2000 *In: Cilliers & Dietrich, 2000*).

Countries with a high proportion of their Gross Domestic Product (GDP) consisting of mineral exports are more likely to face conflict, resulting in less democracy, poor economic growth and greed by competing elites. Perverse economic and institutional effects of resource abundance include (LeBillon, 2000 *In: Cilliers & Dietrich, 2000*):

- Poor economic growth;
- Neglect of non-resource sectors and a low level of economic linkages;
- High level of inequalities;
- Corruption of state institutions;
- High economic inefficiency and subsidization of politicized schemes;

- Budgetary mismanagement;
- High level of debt due to over optimistic revenue forecast and use of future revenues as collateral for loans; and
- High vulnerability to external shock, especially on resource prices.

Such regimes divested of a need for popular legitimacy, finance repressive security apparatuses, and reward a close circle of supporters and/or the general population through patronage/clientelism as a means of remaining in power. Lightly or non-taxed populations tend to be less concerned by the state's lack of accountability, legitimacy and "representativeness" than heavily taxed ones. Such populations live in parallel, non-formal economies not recognized by the State or the International Finance Institutions (IFIs). When resources guarantee sufficient rent, there is little incentive for the leadership to develop a diversified economy that could give rise to alternative sources of economic power and political competitors. The resource rent can be used to avoid the emergence of a class demanding political change (e.g., by impeding the growth of a middleclass independent from the resource rent) (LeBillon, 2000 *In: Cilliers & Dietrich, 2000*).

On the other hand, resource scarcity and population pressure can result in socio-economic innovation, including a diversification of the economy, resulting in a more even distribution of power across society. A resource poor country needs to develop and harness human capital rather than protect the weak resource rents of elites. As human capital develops (e.g., through education and institutions), the economy diversifies, governance becomes more representative and accountable and the likelihood of violent conflict decreases. Resource scarcity can also result in conflict, such as land scarcity in over-populated Rwanda and drought (water scarcity) in the Horn of Africa resulting in eco-violence or green wars (LeBillon, 2000 *In: Cilliers & Dietrich, 2000*) in Darfur, northern Nigeria and, in general,

across the Sahel (see Chapter 5, Section 5.11, CONFLICT LINKED TO OVERPOPULATION AND DESERTIFICATION).

Thus, in many African countries rich in natural resources, it may not be in the interest of the political elite, multi-nationals or their Western donors to have an educated middleclass that might demand accountability from its leaders as to what they do with the wealth generated by the country's natural resources with regard to developing the country and its human resources (see Section 13.10, RESOURCE WARS).

13.6 ENVIRONMENTAL STRESS AND POTENTIAL CONFLICTS

A recent study by OXFAM and arms control groups estimate that over a 15 year period from 1990 and 2005, conflict in 23 African nations (see Chapter 5, Table 5.24: Sub-Saharan African countries facing food emergencies at the beginning of the 21st century) cost these countries US\$ 300 billion (€214 billion) or about US\$ 18 billion/year, roughly equivalent in international aid from donors (see Chapter 11, Section 11.7.1.2, ODA) (AP, 2007; Bobb, 2007). The net result has been a 15%/year decline in GDP in these countries, the majority in Sub-Saharan Africa, resulting in 50% more infant deaths, 15% more malnourished people, a 20% reduction in adult literacy, and life expectancy declining by five years (Bobb, 2007). There are several links between resources, security and development in Africa, each with varying impact on destabilization on the continent (Van Wyk, 2000):

- **Conflict from Rich Resources.** Resources have been and still are used for military and political goals in Africa. Resources are often the defining factor in the power and wealth of a state. However, a number of variables determine the use of resources for a military or political goal, including the degree of resource scarcity, the extent to which the resource supply is

shared by two or more groups, the relative power of these groups and the ease of access to alternative resources. To become rich by controlling resources in war in Africa is a common practice. Rebels, governments and even peacekeepers have fought for diamonds, minerals and timber in recent wars in Liberia and Sierra Leone. In Sierra Leone, one of the recent peace agreements was only reached after the rebel leader, Foday Sankoh, was given a say in the country's mining industry. In Angola, the once ideological war made way for a scramble for oil (by the government) and for diamonds by the rebels. Rebels were offered permission to operate diamond mines legally.

- **Conflict from Scarce Resources.** As resources become scarcer, tensions will rise. Due to population growth, access to resources will not necessarily improve. The lack of resources also contributes to health issues. The UN Economic Commission for Africa (ECA) estimated that 80% of all diseases are caused by polluted water. Scarce resources have been used as an instrument or tool of conflict in Sudan where foreign food aid helps fuel the war (see Chapter 5, Section 5.11.4, Darfur, Sudan, overpopulation, desertification, ethnicity, conflict and politics and Chapter 11, Section 11.8.6, Food Aid and NGOs in Sudan). Genocide in Rwanda is partly a resource war between Hutus and Tutsis (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests - Rwanda, over-population and land degradation linked to deforestation for agriculture and political destabilization and Section 13.8.6.7, Ultimate and proximate causes of Rwanda genocide) and has generated refugees which had an impact on the politics and security of neighboring states. War looms around the corner in much of Sub-Saharan Africa from scarce water resources (see Section 13.11, AFRICA'S POTENTIAL WATER WARS). Conflict over land and other resources is a continuous issue in Kenya, contributing to major ethnic conflicts in 2008 (see Chapter 5, Section 5.7.1.3, Improperly

planned land tenure; impacts on wildlife, conflicts between pastoralists and small-scale farmers, Amboseli and Maasai Mara).

- Resource installations, such as dams on rivers, have been used as targets of violence, conflict and/or war (see Chapter 7, Section 7.10.3, Dam Impacts on Ethnic and Other Conflicts and Section 7.10.3.1, Senegal River and Section 7.10.3.2, Cahora Bassa Dam, Mozambique). South Africa's intervention in Lesotho in September 1998 was to defend, among others, the Katse Dam, part of the Lesotho Highlands Water Project, from a possible attempted bombardment by the Lesotho Defense Force [see Chapter 7, Section 7.6.1, Lesotho Highlands Water Project (LHWP) and Chapter 12, Section 12.8.1, South Africa/Lesotho and Chapter 13, Section 13.11.2, Lesotho Highlands].
- Inequalities in resource distribution, use, management and development can result nationally and/or internationally in conflict as in Sierra Leone (see Section 13.10.2.1, Sierra Leone, war and diamonds).

Against this background, six key issues are identified in the emerging patterns of instability, due to resources in southern Africa (Van Wyk, 2000), that also apply to much of Sub-Saharan Africa:

- Secure supplies of water/energy in terms of quantity, quality, regularity and pricing;
- Competing or conflicting claims to and uses of resources at interstate or transborder community level;
- Transborder ecological effects of resource management caused mainly by intrastate practices leading to various effects;
- The militarization and regimentation of environmental management in relation to the illegal and armed acquisition of natural resources across national borders;

- New forms of land alienation through joint and cross border management of natural resources to achieve economies of scale (such as the Kgalagadi Transfrontier Park), the development of regional products such as tourism packages and spatial development schemes, such as the Maputo Corridor (see Chapter 11, Section 11.11.5, Trans-Frontier Conservation Areas (TFCAs), Southern Africa); and
- External global hegemony and control over resources and their use through the private cross border investment by multinational corporations that are supported by regional governments through global governance treaties (such as the Convention on International Trade in Endangered Species (CITES), Chapter 10), trade and aid conditionalities (see Chapter 11, Section 11.7.2, Foreign Assistance Conditionalities Good Business for Donor County Not Recipient/Host Country and Chapter 12, Section 12.3.3, Structural Adjustment and Cross Conditionalities and Section 12.3.4, Structural Adjustment, U.S. Movement to Control Developing Economies).

Trade generates economic benefits because, given free and efficient markets, it encourages trading partners to specialize in goods or services that they have some comparative advantage in. Since developing countries often have abundant natural resources and cheap, plentiful labor, trade liberalization has fostered shifts toward labor and resource intensive sectors such as mining, logging, garment manufacturing and export crop production. Most of these sectors generate environmental costs not reflected in the production costs of individual enterprises, be they farm, households or multinational companies. Social (and environmental) costs of production are excessive production, resource consumption and waste emissions (Wood, 2001 *In: Diaz-Bonilla & Robinson, 2001*).

Based on studies of developed countries, although natural resource consumption and degradation increases as economies grow, an income threshold (middleclass)

is attained, above which demand for a better environment stimulates investment in environmental protection and rehabilitation. Degradation is thus reduced. Many developing countries are so poor, population growth so high and natural resources already so stressed, that catastrophic, perhaps irreversible, environmental damage may well occur long before any such threshold is reached (Wood, 2001 *In: Diaz-Bonilla & Robinson, 2001*).

Since environmental policies and institutions are likely to be weak in developing countries, producers there (be they domestic or foreign) have little incentive to care about the environmental externalities of their actions. Examples include:

- Rampant logging of the world's biologically diverse and carbon-rich tropical forests [see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the "Dobi Dobi", More Parks and Protected Areas and Section 11.11.7, Case Study Bongo in the Congo (Brazzaville)];
- Trophy hunting with little or no monitoring to assure economic and ecological sustainability (see Chapter 9, Section 9.7.7, Inappropriate or No Wildlife Monitoring to Assure Sustainability) or true integration of local indigenous peoples into the management of and benefiting from these areas (see Chapter 9, Section 9.7.2.1, Devolution through policy reform, land and resource tenure). The lack of monitoring to assure sustainability is a general problem in SSA, where most natural resources are often handled as short-term commodities. Why should this not be when the donors and IFIs are waiting around the corner to artificially prop up governments, while the private sector lives in an environment of insecurity; incentives to both the government (foreign aid) and the private sector (insecurity) to mine the resources for short-term gains as opposed to using Africa's natural resources for nation building. Until there is a critical mass of educated people from the rural communities willing to stand up

for their rights, this imbalance will continue along with the mining of these natural resources;

- Inappropriate coastal development which destroys coral reefs, mangroves and grass beds (see Chapter 8);
- Inappropriately placed dams (see Chapter 7);
- Oil pollution of the land, air and water in the Niger Delta of Nigeria from unregulated oil exploitation (see Section 13.10.1.3, Oil and Repression in the Niger Delta – Nigeria); and
- Poor worker safety, unregulated air pollution both in and outside of the workplace, pollution of surface waters, slave labor, and slums like Mathare and Kibera around Nairobi and the Athi River, Kenya (UNDP, 2005).

Magome and Fabricius (2004 *In:* Fabricius, Kock, Magome & Turner, 2004) suggest that the Convention on Biological Diversity (CBD), which, among other things, encourages sustainable use of biodiversity resources, while both sharing benefits with indigenous peoples and respecting their traditional knowledge and management systems (see Chapter 9, Section 9.3, COMMUNITY BASED NATURAL RESOURCES MANAGEMENT (CBNRM) PROGRAMS – PART OF THE WAY FORWARD), is in conflict with the World Trade Organization (WTO). The WTO promotes privatization of biodiversity resources, knowledge and technologies, possibly to the detriment of nation states and local people (Kennedy, 1998 *In:* Magome & Fabricius, 2004 *In:* Fabricius, *et al.*, 2004). This is

“all for short-term gains by foreign investors, who can make their money and leave when the resource base runs out, and or the environment is too damaged to allow it to continue generating income. This raises concerns that globalization might create ‘pollution havens’ in developing countries, where foreign investors operate to escape stricter environmental laws and enforcement in their own countries. There are also fears that governments might

progressively push environmental standards lower as they compete to attract scarce foreign investment (the 'race to the bottom' hypothesis). These concerns are real and must be dealt with.

Some governments' adoption of lenient environmental standards raises concerns that these countries are, in effect, subsidizing exports and reducing the competitiveness of producers in countries with stricter standards. Attempts to raise environmental standards bring protests from domestic producers who are concerned about potentially higher production costs and loss of international competitiveness. Politicians express concern too about increasing domestic prices in the face of widespread poverty. Furthermore, developing countries maintain that differences in resource endowment, pollution assimilation capacities, and social preferences with regard to environmental standards are legitimate sources of their comparative advantage.

There is thus a growing sentiment that formal linkages should be strengthened between the World Trade Organization (WTO) process and global environmental regulation. But obstacles remain, such as resentment toward rich countries seeking to impose standards that are at odds with economic conditions and social preferences in poor countries. Moves to strengthen environmental regulation as a pre-condition for trade are perceived largely as a guise by which rich countries legitimize non-tariff trade barriers" (Wood, 2001 *In: Diaz-Bonilla & Robinson, 2001*).

Likewise, the ILO (2004) is concerned

"that incentive competition between developing countries to attract FDI is inducing these countries to go too far in lowering regulations, taxes, environmental protection and labor standards".

Bond (2002) raises similar concerns over the need to bring environmental externalities, such as pollution, into the market place through taxes or the trading of pollution rights, assuring that these costs are adequately accounted for as a part of doing business. The question that remains is whether the WTO is an impartial mediator or an arm of the West, which will be used to control and manipulate the Developing World. The jury is still out.

In the early 1990s, one had to only drive by the industries along the Athi River, Kenya, to smell the polluted air and see the polluted river, while “slave labor” lived in a cesspool of their excrement in some of the worst slums the world has ever seen. Profits were maximized at the cost of the environment and the people. As will be discussed below, pollution of the Niger Delta by oil companies continues in the 21st century. The private sector in the safari and ecotourism industries in most of Africa are foreign carpetbaggers “in bed” with governments, both of whom make the majority of the profits while great inequity exists in what they are willing to pay communities and individuals that are ignorant of the true value of their natural resources (see Chapter 9, Section 9.7.6.5, Until safari and tourism companies are community-owned and operated, majority of net profits will go to other stakeholders). This is also true concerning timber [see Chapter 11, Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the “Dobi Dobi”, More Parks and Protected Areas and Section 11.11.7, Case Study Bongo In The Congo (Brazzaville)], minerals and fisheries (see Chapter 4, IMPERIALISM, INDEPENDENCE AND FRESHWATER FISHERIES).

Legum (2002) makes it very clear that a major problem with large, rich corporations is that they have a feeble record with regard to pollution and conservation since the bottom line of their shareholders is to maximize profits in a very competitive global market. Thus, unless civil society requires environmental mitigation through laws, the risk is that environmental issues will not be addressed. The current problem is that the majority of Africans are too uneducated to realize these issues.

Africa must make sure that both the African Growth and Opportunity Act (AGOA) and the New Partnership for Africa’s Development (NEPAD) do not run

into this problem. Ideally, African countries would adopt similar environmental laws, which all investors would be required to follow as a means of putting each country on an equal footing in its competition for investment, while assuring protection of the environment from this investment. There is some concern that the Multilateral Agreement on Investment (MAI), if enacted through the WTO or similar international body, would take away the right of countries to impose such environmental controls on international investors, including the right of the investor to sue a government for such impositions (Legum, 2002).

13.7 GLOBALIZATION AND MULTI-NATIONALS – CORPORATE CAPITALISM

While containing 5% of the world's population (Ruppert, 2004)

“the United States alone consumes approximately 30% of all raw materials used by the human population in any given year” (Klare, 2001),

and 25% of the world's energy (Ruppert, 2004). Discounting the growing demand by Third World populations for resources, the current rate of First World consumption of resources is not sustainable (Diamond, 2005).

“Our first problem is not immigration but the American corporation. That is the force which has succeeded in taking America away from us...The people who feel this lack of balance probably make up 67% (2/3rds) of the country, but they don't want to think about it. We don't control our country. Corporate power is running this country now. The notion that we have an active democracy that controls our fate is not true” (Mailer, 2003)

Some 65,000 Multi-National Enterprises (MNEs), with around 850,000 foreign affiliates, are the key actors behind global production systems (ILO, 2004). A 1995 study by the Institute for Policy Studies (IS) provides us with the

information that, of the top 100 economies in the world, 51 are corporations (Copeland, 2000; Legum, 2002) and only 49 are countries (Madeley, 2002):

- Six Transnational Corporations (TNCs) or multi-nationals control 85% of the world trade in grains;
- Eight TNCs control 55-66 % of the global trade in coffee;
- Seven TNCs control 90% of global trade in tea;
- Three TNCs control 83% of world trade in cocoa; and
- Three TNCs control 80% of world trade in bananas.

Cargill alone controls 80% of the global grain distribution. Three agri-businesses (Syngenta, Dupont and Monsanto) account for 67% (2/3rds) of the pesticides, about 25% (1/4) of the global seed market and 100% of the transgenic (genetic material – DNA from another species and/or organism) seed market (Table 13.1) (Madeley, 2002). A problem that arises is that the World Trade Organization (WTO) negotiates trade between countries, but has no regulatory authority over TNCs (Madeley, 2002), which by monopolizing the world market for both agricultural inputs and outputs, can control prices to their benefit as the middlemen between the farmer and consumer.

The top 200 corporations combined sales are bigger than the combined economies of all countries minus the biggest nine; that is they surpass the combined economies of 182 countries (Copeland, 2000; Legum, 2002). About 500 companies control 67% (2/3rds) of the world trade and 50% (half) of all the productive assets (Legum, 2002).

Table 13.1: Corporate control of global commodity trade, 1983

Commodity	World Exports (US\$ million)	% Marketed By 3-6 Largest Transnationals*
<u>Food</u>		
Wheat	17,851	85-90
Sugar	10,636	60
Corn (Maize)	9,833	85-90
Coffee	9,636	85-90
Rice	3,613	70
Cocoa Beans	2051	85
Tea	1,844	80
Bananas	1,324	70-75
Pineapples (fresh)	74	90
<u>Agricultural raw materials</u>		
Forest products	47,255	90
Cotton	6,567	85-90
Tobacco	4,239	85-90
Hides and skins	4,047	25
Natural Rubber	3,321	70-75
Jute	135	85-90
<u>Ores, minerals and metals</u>		
Mineral fuels	382,685	75
Copper	8,287	80-85
Iron ore	6,231	90-95
Tin	2,230	75-80
Phosphates	1,588	50-60
Bauxite	833	80-85

*In a few cases up to 15 transnational traders account for the bulk of the market.
 Source: Copeland (2000) with permission, Copeland.

"IS⁵¹¹ goes on to point out that the 12th largest corporation, Wal-Mart, had annual sales greater in value than the GDPs of 161 countries. Looking at how this economic power translates into real terms, we see from the following table that the vast majority of the world's trade in commodities is accounted for by a handful of Transnational Corporations (TNCs)" (Copeland, 2000) (Table 13.1).

This trend (to concentrate corporate power) ridicules the theoretical argument of a purely free-market economy. Governments still make a policy on the foundations of competitive general equilibrium theory - whose many bizarre assumptions include that there is an infinite number of small companies and that none has power over the market (Legum, 2002). These technology-based multi-nationals or Transnational Corporations (TNCs) as they may be called, tend to buy out or put out of business labor-intensive rivals. While these top 200 TNCs employ 18.8 million workers, it is only 0.75% of the world's work force. Between 1993 and 1995, while the global turnover of the top 100 TNCs increased by 25%, they cut their workforce by 4% (Legum, 2002).

Growth of global production systems has been the most pronounced in the high-tech industries (electronics, semi-conductors, etc.) and in labor intensive consumer goods (textiles, garments and footwear).

"It is also becoming significant in the service sector where technological advances have made it possible for services such as software development, financial services and call centers (e.g., India) to be supplied from different countries around the globe. The high-tech industries have experienced the fastest growth and now constitute the largest single component of the manufactured exports of developing countries. In these industries, the production of parts and components is carried out by subsidiaries of MNEs (Multi-National Enterprises) located in developing countries" (ILO, 2004).

⁵¹¹ Institute for Policy Studies (IPS), Washington D.C., www.ips-dc.org.

Until now, globalization has been the result of powerful governments in cahoots with multi-national corporations, especially the United States, pushing trade deals in which the neoliberal/corporate hold over the world's "economy, polity, journalism and culture" is overwhelming. In fact, the principle architects of the neoliberal "Washington Consensus", providing unregulated access to markets of the developing world, are huge corporations (Chomsky, 1999). Noam Chomsky (1999) feels that democracy is under attack worldwide, including in the leading industrial countries, where powerful corporate entities are increasingly interlinked and reliant on powerful states and largely unaccountable to the public. Functioning democracy presupposes relative equality in access to resources – material, informational and other. In state capitalist democracies, while the public arena has been enriched by long and bitter struggles, private power has labored to restrict democracy by transferring decision making from the public to the unaccountable arena. Noam Chomsky feels that the "Corporatization of America" during the past century has been an attack on democracy, with "free-trade" agreements transferring decisions over people's lives and aspirations into the hands of "private tyrannies" operating in secret without public supervision. It is what the Financial Times calls a "*defacto* world government" that operates in secret and without accountability (Chomsky, 1999).

While the above issues need to be addressed, globalization is a fact of life. Global problems require global approaches and institutions. Protectionism, isolationism and unilateralism in the extreme, will not solve them (Messer & Cohen, 2001 *In: Diaz-Bonilla & Robinson, 2001*).

13.7.1 Western Multi-Nationals, Globalization and American Jobs

In the era of globalization, American jobs are expendable, the bottom line being profits to multi-nationals as they move overseas to maximize profits from low

wages and lax environmental controls. Perkins (2006) equates the sweatshops and lack of environmental controls, typical of many multi-national interventions in the developing world, as a “type of slavery reminiscent of medieval manors and southern plantations”. A vast majority of the U.S. trade deficit is due to extremely unbalanced trading relationships with a few key regions/countries, including Asia (75% of deficit in manufactured goods), the North American Free-Trade Agreement (NAFTA) between U.S., Canada and Mexico: (13%) and the European Union (EU) (13%) in a limited number of critical industries (e.g., aircraft, steel and agriculture with the EU). The United States had a combined trade deficit with Japan, China and Germany of US\$ 144 billion in 1998, amounting to about 67% of the total deficit in goods traded valued at US\$ 229 billion. With low labor wages, China has lured multinationals and their associated technology, rapidly moving from fabrication of “low-tech products such as shoes and apparel into higher-technology products such as aircraft and parts, computers, motor vehicles and telecommunications” (Scott, 1999). About 55% of the U.S. trade deficit is with developing countries.

“The dependence of the U.S. on commodity exports and the steady erosion of output and employment in high-wage, high technologies industries are stark indicators of the failure of U.S. trade and industrial policies to nurture and sustain U.S. international competitiveness” (Scott, 1999). Meanwhile,

“U.S. multinational businesses have prospered. The soaring prices of U.S. stocks reflect the renewed worldwide dominance of U.S. companies...U.S. corporations have continued to play a dominant role in world production and trade by aggressively investing and moving production abroad. Multi-nationals use plants in other countries to serve foreign markets and, increasingly, to service the U.S. market as well. For example, Mexico now exports more cars to the U.S. than the U.S. exports to the rest of the world. And Mexico's largest exporter is Daimler-Chrysler” (Scott, 1999).

Because of an increasing global trade deficit, the U.S. lost 2.4 million manufacturing jobs between 1979 and 1994. Between March 1998 and July 1999, they lost another 500,000 jobs and by mid-1999, they were expected to lose another 400-500,000 manufacturing jobs, mainly among non-college educated workers that make up 75% of the U.S. labor force. Trade inequalities in the U.S. have been responsible for 20-25% of the increase in income inequality in the U.S. over the past two decades, eliminating high-wage, high skilled manufacturing jobs in the U.S., while pushing workers into other sectors where wages are lower, such as restaurants and health service industries (Scott, 1999) (see Chapter 12, Section 12.2.4.4, Cotton subsidies and protected markets, Trade Agreements Hurt U.S. Textiles and Section 13.13.4, NAFTA, Maquiladora and the Environment, Lessons for Sub-Saharan Africa).

13.7.2 Western Foreign Policy and Multi-Nationals Exploiting Africa

“All peoples have the right to their country’s natural resources and wealth without foreign domination”. (African Charter on Human and Peoples’ Rights, Article No. 21 *In: Gary & Karl, 2003*).

“Over the past two decades, oil-importing countries have enjoyed the benefits of double insurance against oil shocks: considerable spare production capacity in Organization of the Petroleum Exporting Countries (OPEC),⁵¹² and sizable emergency stocks held by OECD countries. However, spare capacity is now reduced to historically low levels and there are significant risks that the oil market will continue to be tight going forward” (IMF, 2005).

U.S. oil production peaked around 1970 at about 10 million barrels/day (mbd), declining ever since, to about 5 million barrels/day in 2005 (GAO, 2007). In 2005, the U.S. imported 59% of the more than 20 million barrels/day (mbd) of oil it consumed, with imports expected to account for 60% of consumption by 2025

⁵¹² OPEC Members include Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Quatar, Saudia Arabia, United Arab Emirates and Venezuela (Solcomhouse, 2005; Wikipedia, 2005).

(Blum, 2005). The GAO (2007) estimates that the U.S. imported 66% of its oil and petroleum products in 2005, with transportation accounting for 65% of U.S. oil consumption. U.S. proven oil reserves have declined from 39.0 billion barrels in 1970 to 22.7 billion barrels at the end of 2002, less than 2% of the world's known oil reserves. U.S. petroleum production is expected to decrease from 9.2 mbd in 2002 to 8.6 mbd by 2025, while oil consumption will rise from 19.6 mbd in 2002 to 28.3 mbd in 2025, a 44% increase. The difference will have to be imported. Four major producers provided over nearly 70% of the U.S. imported oil in 2002: 1) Canada, 2) Mexico and 3) Venezuela combined supplying 45% and 4) the Persian Gulf region nearly 20% of the U.S. imported oil (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates). OPEC country production is expected to account for 61% of the increase in petroleum demand over the next two decades (U.S. Department of Energy, 2005). The majority of the OPEC countries lie in politically unstable regions of the World. Thus, the United States is increasingly dependent on foreign oil making its economy highly vulnerable to disruptions. The U.S. strategic petroleum reserve has decreased from 118 days in 1985 to 53 days incase of a disruption (U.S. Department of Energy, 2005).

"Cheap oil fuels America's economy" (U.S. Department of Energy, 2005). Given the current situation in the Middle East and growing concerns over the long-term availability of oil, access to cheap oil is becoming a preoccupation with the West (Flakus, 2004). There is also a growing need for America to reduce its dependence on Middle East oil (U.S. Department of Energy, 2005). According to Paul Roberts, author of the book, *The End of Oil: On the Edge of a Perilous New World*, most of the easily obtainable, cheap oil has already been discovered and it will become more and more difficult to meet world demand (Flakus, 2004).

Global oil discoveries peaked in the mid-1960s. New fields tend to be smaller and in less accessible environments (e.g., deep sea and polar regions) (Ruppert, 2004). A peak in worldwide oil production could come within the next few decades (IMF, 2005), while the IEA (International Energy Agency) estimates non-OPEC oil production to peak around 2010 (GAO, 2007). At the same time, demand for energy is increasing, driven by emerging nations like China and India (IMF, 2005). The GAO (2007) expects global oil production will peak between now and 2040. The estimates of exactly when this peak will occur range widely due to variables such as the amount and how quickly oil remaining in the ground is used; how much of that oil can ultimately be produced given technological, cost, and environmental challenges; unfavorable political and investment conditions where 60% of the world's oil reserves are located; and future global demand.

Advanced countries will account for 25% of the increase in world oil demand, with most of the demand growth coming from developing countries. Transport demand in the non-OECD region will almost triple from 16 million barrels/day (mbd) to 45 mbd between 2003 and 2030, driven by a six-fold increase in vehicle ownership (IMF, 2005). It is estimated that 50% of all oil produced is used for transport (Ruppert, 2004).

This will make the world ever more dependent on politically unstable nations that have plenty of oil. Others like H. Sterling Burnett of the U.S. -based National Center for Policy Analysis⁵¹³ do not entirely agree, saying that there are three trillion barrels of oil reserves which could last 56 years under current consumption rates, with a 1.4% annual growth even if no more oil was discovered or new technologies developed to extract more from existing reserves. If new

⁵¹³ National Center for Policy Analysis, Headquarters: 12770 Coit Rd., Suite 800, Dallas, TX 75251-1339, Phone: 972/386-6272, Fax: 972/386-0924, Washington Office: 601 Pennsylvania Avenue NW, Suite 900 South Building Washington, DC 20004 Phone: 202/220-3082, Fax: 202/220-3096, <http://www.ncpa.org/contact.html>.

technologies can be developed, there are seven trillion (GAO, 2007) to 14 trillion barrels (Flakus, 2004) of oil in shale oil and tar sands that could suffice for 500 years, although this would imply higher costs of extraction and thus, higher costs to the consumers. Everyone agrees that alternative energies need investigating (Flakus, 2004).

Other estimates are that proven (conventional) oil reserves are sufficient to meet world demand at current levels for over 40 years. However, assuming access to other (non-conventional) sources such as shale, coal and deep-water, the International Energy Agency estimates oil resources could cover 70 years of average annual consumption (IMF, 2005), but once again at a much greater cost. Similarly, Klare (2001) estimates that at a global consumption of 73 million barrel/day in 1999⁵¹⁴ or 26.6 billion barrels/year, the residual oil supply of 1,600 billion (1.6 trillion) barrels could last 60 years, assuming static oil consumption. Assuming a rise in oil consumption by 1.9%/year between 1997 and 2020, total depletion could occur by 2040 (within 40 years) (Klare, 2001). Whether it occurs in 40 years or 70 years, oil is running out or, if nothing else, running low and becoming significantly more expensive as global demand increases. Estimates for years to exhaust proven reserves at current production rates for key oil producing countries include (WRI, 2005):

- Iraq, over 100 years
- Iran, Saudi Arabia, Libya, Venezuela and Kazakhstan, 43-100 years each
- Nigeria, Gabon, DRC, Angola, Russia, Australia, Canada, Brazil, Ecuador and Peru, 21-42 years each
- Canada, India, China, 13-20 years each
- USA, Argentina, Columbia, 6-12 years

⁵¹⁴ In 2000 the U.S. consumed 19.5 million barrels/day (25% of total global consumption) out of a total of 77.1 million barrels/day, projected to rise to 21.2 million barrels/day (25% of total global consumption) out of 84.8 million barrels/day by 2005, to as high as 24.7 million barrels/day (22% of total global consumption) out of 110.1 million barrels/day by 2020 (Klare, 2001).

Prices will remain volatile and there is no “silver bullet” with regard to alternative energy. The world will have to improve on the technology and efficiencies of a number of energy sources from wind, solar, hydro, nuclear, hydrogen, biomass/biofuels and fossil (oil, natural gas and coal) (Parfit, 2005).

The increasing use of biofuels using grains, soybeans, etc. risks to result in a declining availability of food to feed the world and should be a wakeup call to Sub-Saharan Africa to improving food security and increased food self-sufficiency (von Braun, 2005; Conway, 2005; Moreira, 2005; Hilker, 2006; TheWatt, 2006; Wald, 2006) (see Chapter 5, Section 5.3.1.2, Keeping up with future demand – global deficits of the 21st century).

Meanwhile, oil is king and to be cherished by those dependent on it to drive their economies.

The United States is not waiting around to see if cost-effective technologies can be developed to extract oil or produce alternative energy.

“As a consequence of the impending interplay of U.S. energy security interests and African economic developmental goals, the United States is on the verge of an historic, strategic alignment with West Africa”, the Gulf of Guinea emerging “as a new energy center of gravity and a vital U.S. interest” (AOPIG, 2002).

Oil security and counter-terrorism form the backbone of the U.S. Africa policy (Booker & Colgan, 2004). A 1997 evaluation in foreign aid and development by the U.S. Congress (CBO, 1997) raised concern that with the end of the Cold War, a potential threat facing the United States, and for that matter the West,

“may be the spread of weapons of mass destruction, especially if combined with political instability. An internal conflict in a developing country that became a regional conflict would have

dire consequences for U.S. allies if it involved use of nuclear, chemical, or biological weapons - not to mention the potential impact on the regional and global environment. In 1994, a brief survey of the world's trouble spots show(ed) a fairly striking correlation between economic malaise on the one hand and domestic unrest and political instability on the other. If the United States can address those problems by using its foreign aid to help to create economic opportunities and invest in human capital, then the chance of conflict may be reduced" (CBO, 1997).

The following are excerpts from presentations made on April 6, 2001, when U.S. Congresswoman Cynthia McKinney (D), GA. sponsored a forum to assess the impacts of globalization on the exploitation of Africa's resources. McKinney sat on the House International Relations Committee. She is African-American. More detailed case studies will follow to support these statements.

"...investigations into the activities of Western governments and Western businessmen in postcolonial Africa provide clear evidence of the West's long-standing propensity for cruelty, avarice, and treachery. The misconduct of Western nations in Africa is not due to momentary lapses, individual defects, or errors of common human frailty. Instead, they form part of a long-term malignant policy designed to access and plunder Africa's wealth at the expense of Africa's people...The West has, for decades, plundered Africa's wealth and permitted, and even, assisted in slaughtering Africa's people. The West has been able to do this while still shrewdly cultivating the myth that much of Africa's problems today are African made--we have all heard the usual Western defenses that Africa's problems are the fault of corrupt African administrations, centuries-old tribal hatreds, the fault of unsophisticated peoples. But we know that those statements are all a lie. We have always known it...at the heart of Africa's suffering is the West's, and most notably the United States', desire to access Africa's diamonds, oil, natural gas, and other precious resources. You will hear that the West, and most notably the United States, has set in motion a policy of oppression, destabilization and tempered, not by moral principle, but by a ruthless desire to enrich itself on Africa's fabulous wealth. While falsely pretending to be the friends and allies of many African countries, so desperate for help and assistance, many western nations have in reality betrayed

those countries' trust--and instead, have relentlessly pursued their own selfish military and economic policies. Western countries have incited rebellion against stable African governments by encouraging and even arming opposition parties and rebel groups to begin armed insurrection" (McKinney, 2001).

"More troubling than these overt problems are those that involve covert assistance to the Rwandan and Ugandan militaries. Sources in the Great Lakes region consistently report the presence of a U.S.-built military base near Cyangugu, Rwanda, near the Congolese border. The base, reported to have been partly constructed by the U.S. firm Brown & Root (today Kellogg, Brown and Root), a subsidiary of Halliburton (U.S. Vice President Cheney, under the George W. Bush administration, is a former Halliburton chief executive), is said to be involved with training Rwandan Patriotic Front (RPF) forces and providing logistics support to their troops in the DRC" (Madsen,⁵¹⁵ 2001 *In: McKinney, 2001*).

"According to a survey by the Center for Public Integrity and the International Consortium of Journalists, Halliburton is first and foremost among a dozen or so U.S. firms that fit the category of 'Private Military Companies/Contractors (PMCs)' – primary service providers of high-tech warfare including communications and intelligence, logistical support, and battlefield training and planning" (Phillips, 2004).

13.7.1.1 Legitimization of private military companies/contractors (PMCs) by Western governments and international bodies

Private Military Companies/Contractors (PMCs) were unheard of in the English language prior to 1995, but are now in effect legitimized by Western governments and politicians (Campbell, 2002).

'Mercenaries' are officially outlawed under Article 47 of the Geneva Convention, which defines them as persons recruited for armed conflict by or in a country other than their own and

⁵¹⁵ Author of *Genocide and Covert Activities in Africa 1993-1999*, Lewiston, NY: The Edwin Mellen Press, 1999.

motivated solely by personal gain. However, few modern PMCs fit that definition and, indeed, spokesmen for such companies insist they rarely engage in combat and provide military skills only to legitimate, internationally recognized governments. The ICIJ (International Consortium of Investigative Journalists) investigation found that a wide range of companies – from large corporations that offer military training, security, landmine clearance and military base construction to start-up entrepreneurs offering combat services and tactical training – are in what has become the complex and multibillion-dollar business of war (Peterson, 2002).

Peterson (2002) provides an excellent overview of PMCs and how they get around international and national laws, working through official government agencies that have need of their services.

Since 1994, the U.S. Defense Department has entered into over 3,000 contracts with PMCs valued at US\$ 300 billion, with 2,700 of the contracts with just two companies; Kellogg Brown and Root,⁵¹⁶ the Halliburton⁵¹⁷ subsidiary, and the Virginia-based Booz Allen Hamilton⁵¹⁸ (Peterson, 2002; Phillips, 2004). Peterson (2002) estimates a total of 24 U.S.-based PMCs. “British mercenary operators have been employed by the CIA, the Drug Enforcement Agency and the U.S. State Department, as well as by Britain’s own Secret Intelligence Service (SIS)” (Campbell, 2002). The use of PMCs privatizes military functions, circumventing oversight by and accountability to the U.S. Congress and allows the executive branch to evade congressional limitations of troop strength. PMCs can enter into combat without officially committing the U.S., while avoiding U.S. neutrality laws and public/congressional attention (Phillips, 2004).

⁵¹⁶ Kellogg Brown and Root, 4100 Clinton Drive, Houston, TX 77020-6237, U.S., 713.753.3011, http://www.halliburton.com/about/exec_kbr.jsp.

⁵¹⁷ Halliburton, 5 Houston Center, 1401 McKinney, Suite 2400, Houston, TX 77010-4008, U.S. 713.759.2600, <http://www.halliburton.com/>.

⁵¹⁸ Booz Allen Hamilton, 8283 Greensboro Drive, McLean, Virginia 22102, Tel: +1 (703) 902-5000, <http://www.boozallen.com/>.

“The increasing reliance by the Department of Defense on so-called Private Military Companies/Contractors (PMCs) is of special concern. Many of these PMCs, once labeled as ‘mercenaries’ by previous administrations when they were used as foreign policy instruments by the colonial powers of France, Belgium, Portugal, and South Africa, have close links with some of the largest mining and oil companies involved in Africa today...America’s policy toward Africa during the past decade, rather than seeking to stabilize situations where civil war and ethnic turmoil reign supreme, has seemingly promoted destabilization. Former Secretary of State Madeleine Albright was fond of calling pro-U.S. military leaders in Africa who assumed power by force and then cloaked themselves in civilian attire, ‘beacons of hope’ ” (Madsen, 2001 *In: McKinney*, 2001).

“The strong links between the U.S. government and many of the Private Military Companies/Contractors (PMCs) that contract with them has presented questions regarding the revolving door between government and the private sector”,

such as U.S. Vice President Cheney’s link to Halliburton (former CEO) and its subsidiary Kellogg, Brown and Root, and former defense secretary in the Reagan administration Frank Carlucci’s links to the Carlyle Group⁵¹⁹ and its subsidiaries (Peterson, 2002). The Virginia-based PMC, DynCorp International⁵²⁰ has just trained 500 recruits of Liberia Armed Forces, while also carrying out police training in Iraq and Afghanistan (Schwarz & Collins, 2007). Madsen (1999) describes DynCorp as a mercenary group, major contractor for the U.S. military and intelligence communities, active in Angola and other Sub-Saharan African countries.

⁵¹⁹ Carlyle Group, 1001 Pennsylvania Avenue, NW, Washington, DC 20004-2505, United States, Tel: 202 729 5626, Fax: 202 347 1818 <http://www.thecarlylegroup.com/eng/index.html>. At the end of 2002, Frank Carlucci became Chairman Emeritus after nine-year tenure as Chairman, <http://www.thecarlylegroup.com/eng/news/15-news693.html>.

⁵²⁰ DynCorp International, 3190 Fairview Park Drive, Suite 700, Falls Church, VA 22042, <http://www.dyn-intl.com/>.

In fact, since the 18th century, mercenaries have been used by the colonial powers in Africa as extensions of mercantile expeditions pioneering the colonization of African territories, as well as the suppression of African aspirations for self-determination and political independence (Musah & Fayemi, 2000). Private European companies maintained private armies in the colonies to ensure compliance with company law, including forcing Africans to pay head taxes in cash or kind (e.g., rubber quotas, labor) and to work in mines and plantations (Sachs, 2005). Examples include the *Compagnie Francaise de L'Afrique de l'Ouest* (CFAO) and the *Société Commerciale Ouest Africaine* (SCOA) who had security forces paving the way for the expropriation of resources (Musah & Fayemi, 2000). Though by then a benign trading company, CFAO was still operational in the Gambia during the 1980s, when the principal author lived in West Africa.

“In reality, these leaders, who include the current presidents of Uganda, Rwanda, Ethiopia, Angola, Eritrea, Burundi, and the Democratic Republic of Congo preside over countries where ethnic and civil turmoil permit unscrupulous international mining companies to take advantage of the strife to fill their own coffers with conflict diamonds, gold, copper, platinum, and other precious minerals including one (COLTAN) that is a primary component of computer microchips...Some of the companies involved in this new ‘scramble for Africa’ have close links with PMCs. For example, America Minerals Fields, Inc.,⁵²¹ ” (Madsen, 2001 *In: McKinney, 2001*).

⁵²¹American Mineral Fields is owned by Jean-Raymond Boulle who was a known financial supporter of and signing mining contracts with Laurent Kabila of the Alliance of Democratic Forces for the Liberation of Congo /*Alliance des Forces democratique pour la liberation du Congo* (AFDL/ADFL) before he was even recognized as President by the United States, usurping De Beers and Anglo American. Linked to Robert Friedland of DiamondWorks, the holding company of Branch Mining and Branch Energy linked in turn to the mercenary companies of Sandline International (<http://www.sandline.com/site/>, on April 16, 2004 claims to have closed its doors due to a lack of support by government for PMCs, <http://www.sandline.com/>, info@sandline.com) and Executive Outcomes (EO) (address not found). Both have also been involved in Sierra Leone (Peleman, 2000 *In: Musah & Fayemi, 2000*). American Mineral Fields was “heavily involved in promoting the 1996 accession to power of the late Congolese President Laurent-Desire Kabila, and was at the time of its involvement in the Congo’s civil war, headquartered in Hope, Arkansas (home of former President Clinton)...major stockholders

O'Brien (2000 *In: Musah & Fayemi*, 2000) raises the specter of rival mining companies hiring Private Military Companies/Contractors (PMCs) to fight for control of strategic natural resources within a country. Musah (2000 *In: Musah & Fayemi*, 2000) discusses how rival PMCs, some supporting the government and others the Armed Forces Revolutionary Council (AFRC) junta of Major Johnny Paul Koromah/Revolutionary United Front (RUF) rebels coalition in trying to access Sierra Leone's diamond mines. Many PMCs, while acting as security/mercenary groups have affiliated companies to mine Africa's resources once they have created stability, often as partial payment for their services, even if this stability, as it has proven, is short-lived (Musah & Fayemi, 2000).

The *New African* (2001) reports that Madsen's testimony to Congress also demonstrated direct or indirect complicity by the U.S. Government and/or U.S. "Private Military Companies/Contractors (PMCs)", better known as mercenaries in the training of Ugandans, Rwandans and eastern Zaire youth to overthrow Mobutu Sese Seko, providing intelligence leading to the massacre of hundreds of thousands of Hutu refugees by the Rwandan Patriotic Front (RPF), as well as U.S. Special Forces soldiers marching into Kinshasa in 1996 to help Kabila overthrow Mobutu Sese Seko. One of these PMCs, RONCO⁵²² (see Chapter 7, Section 7.8.5, Politics of Proposed Dams on the Gambia River), in Rwanda consisted of largely former U.S. Special Forces personnel that provided explosives, armored vehicles and transport to RPF rebels, assisting their movement into both Rwanda and the Democratic Republic of Congo in contravention of the U.S. initiated UN arms embargo. The U.S. insisted that RONCO was only involved in de-mining,

included long-time associates of former President Clinton going back to his days as Governor of Arkansas...also reportedly enjoys a close relationship with Lazare Kaplan International, Inc., a major international diamond brokerage whose president remains a close confidant of past and current administrations (U.S.) on Africa matters" (Madsen, 2001 *In: McKinney*, 2001).

⁵²² RONCO Consulting Corporation, 2301 M Street, N.W., Suite 400, Washington, DC 20037, www.roncoconsulting.com/index.html.

even though most de-mining was undertaken by joint army, Air Force and Navy Ordinance Detachments periodically sent to Rwanda from bases in the United States and Europe (Madsen, 1999). The second oldest profession in the world, after prostitution, has been resurrected and is living and doing well globally, supported by the U.S. and other Western governments.

The PMCs have strong ties to some of the largest mining and oil companies involved in Africa today, as well as Ugandan and Rwandan militaries responsible for pillaging the Congo's natural resources. In fact, America has a long history of supporting both sides in order to gain access to the Democratic Republic of Congo's natural resources (*New African*, 2001). This is brought out in great detail in Madsen's book (1999), *Genocide and Covert Operations in Africa, 1993-1999*.

The former colonial powers of France, Belgium and England have also frequently employed mercenaries (Musah & Fayemi, 2000), as have the WWF in anti-poaching using KAS Enterprises run by the founder of the British SAS⁵²³, Colonel Sir David Stirling, and the founder of the PMC, Watchdog International (O'Brien, 2000 *In:* Musah & Fayemi, 2000), as well as the World Bank, United Nations and humanitarian NGOs to protect their personnel in regions of conflict (O'Brien, 2000 & Musah, 2000 *In:* Musah & Fayemi, 2000). Parker (2004) goes into great detail in the WWF's employment of Stirling and KAS Enterprises in a program called Operation Lock, who, while working out of South Africa, were prepared to kill poachers outside the law, without a jury or trial, as a means of dealing with elephant and rhino poaching in southern Africa; what Parker refers to as simple terrorism. While training some government anti-poaching teams, Potgieter (1995) gives one the impression the main goal of Operation Lock was to expose the rhino horn and ivory smuggling networks. Parker (2004) also links WWF, especially the WWF/South Africa, through Operation Lock in illicit rhino

⁵²³ Special Air Services.

and ivory trade linked to support of various rebel groups supported by South Africa, including the National Union for the Total Independence of Angola /*União National Para a Independência Total de Angola* (UNITA) in Angola and the *Resistência National Moçambicana* (RENAMO) in Mozambique, while both Potgieter (1995) and Parker (2004) also identify the South African Defense Force as the culprit (see Chapter 10, Section 10.5, RHINO, TRADE OR TRADE CONTROL, WHAT'S BEST FOR CONSERVATION?). Potgieter (1995) places the ultimate failure of Operation Lock as being high jacked by South African intelligence as a front to gather information in surrounding countries hostel to South Africa.

The World Economic Forum (2004) reports that Private Military Companies/Contractors (PMCs) are

“a \$100 billion business globally, with the United States deploying 1 private military worker for every 10 soldiers in Iraq—a 10-fold increase since the 1991 Gulf War. The shortage of mainstream troops available for peace enforcement purposes, including mainstream UN-mandated peace operations, is generating renewed interest in the hitherto taboo topic of the direct engagement of private military companies for combat”.

To say the least, it is shocking when mercenaries become accepted into mainstream society. Similarly, in many developing countries, especially in Sub-Saharan Africa, security companies with armed rapid response teams, in essence PMCs, guarding rich homes from the poor masses have developed into big businesses, undertaking what was traditionally the duty of the police, which the police can no longer fulfill due to the magnitude of the problem.

“It is the whole political economy of southern resource rich countries and their relations with the north that needs to change if inequalities and recurring conflicts are to be avoided” (LeBillon, 2000 *In: Cilliers & Dietrich, 2000*).

13.8 FRANCE/U.S. ANGLOPHONE COMPETITION FOR INFLUENCE AND RESOURCES IN AFRICA – NEW SCRAMBLE FOR AFRICA

“ ‘The last decade’s scramble for Africa saw growing rivalries between U.S. and French oil companies, as deep-water technology opened up new fields off West Africa. Swift expansion followed, as countries called in the oil majors and hoped for a big find. The result was years of fast growth, big signature bonuses and blurred borders between politics and business’ ” (*Africa Confidential*, 2002a In: Gary & Karl, 2003).

In 1898, in the town of Fashoda, southern Sudan, the French routed the British in Cecil Rhode’s quest for a Cape Town to Cairo railway. Britain eventually won out, but the “Fashoda Syndrome” would guide future French leaders in the relations between France and Britain in Africa. Former French President Francois Mitterrand summed up the geo-political view of France towards Africa,

“‘Without Africa, France will have no history in the 21st century’ ” (Madsen, 1999). Current President Jacques Chirac goes on to say, “ ‘France is not in the habit of just occasionally rediscovering Africa (as in recent times, with short visits by U.S. presidents or envoys) because of a chance trip, a crisis, economic turbulence or a climatic catastrophe...France has been (Africa’s) attentive partner for a long time’ ” (Madsen, 1999).

U.S. demand for oil is growing significantly, from 19.7 mbd⁵²⁴ in 2002 to an estimated 26 mbd in 2020 (Gary & Karl, 2003).

“As U.S. energy companies become more involved in Africa, so too does the U.S. Government, driven by both national security and economic concerns. In a global environment shaped by fears of terrorism and instability in the Middle East, Africa is suddenly no longer considered a strategic backwater; a major reason is oil” (Gary & Karl, 2003).

⁵²⁴ By international agreement, a barrel of petroleum equals 42 U. S. gallons, which is about 159 liters (UNC, 2004).

The 19.5 mbd of oil consumed by the USA constitute 26% of daily global oil consumption and amounts to importing 9.8 mbd or more, more than half the oil it consumes. The surest way for the U.S. to sustain its overwhelming dependence on oil is to control the 65-67% of the world's oil reserves in the Persian Gulf (Klare, 2001; Mailer, 2003). In addition, the Gulf of Guinea is expected to provide 25% of America's oil by 2015 (GPF, 2002; Booker & Colgan, 2004; Commission for Africa, 2005; CRS, 2007), making countries such as Angola, Cameroon, Chad, Congo Brazzaville, the Democratic Republic of Congo, Equatorial Guinea, Gabon and Nigeria critical to its foreign policy/agenda in Sub-Saharan Africa (Booker & Colgan, 2004).

“The Gulf of Guinea region will receive more than US\$ 200 billion in oil revenues over the next decade and overall production is expected to jump from 3.8 million barrels per day (bpd) in 2003 to 6.8 million bpd by 2008” (CAFOD, 2004).

This is supported by Gary & Karl (2003), estimating that US\$ 200 billion in oil revenue will accrue to Sub-Saharan African governments over the next decade.

“Declines in production from mature producers, e.g. Gabon or Cameroon, will be more than offset by large increases in production in Nigeria, Angola and Equatorial Guinea, as well as the arrival of new producers including Chad, possibly São Tomé and Príncipe and others. If anything, the figure of US\$ 200 billion will, in the end, prove to be far too low” (Gary & Karl, 2003).

Studies indicate that the greatest increase in oil production globally in the next decade is likely to come from West Africa. The U.S. is following this trend closely (Booker & Colgan, 2004).

13.8.1 United States Entry into Post WWII Imperialism

In his farewell speech to the nation, America's Dwight D. Eisenhower warned its citizens to beware of the military-industrial complex and its threat to the very structure of America's society.

"We now stand 10 years past the midpoint of a century that has witnessed four major wars among great nations. Three of these involved our own country. Despite these holocausts America is today the strongest, the most influential and most productive nation in the world. Understandably proud of this pre-eminence, we yet realize that America's leadership and prestige depend, not merely upon our unmatched material progress, riches and military strength, but on how we use our power in the interests of world peace and human betterment. Throughout America's adventure in free government, our basic purposes have been to keep the peace; to foster progress in human achievement, and to enhance liberty, dignity and integrity among people and among nations. To strive for less would be unworthy of a free and religious people...Progress toward these noble goals is persistently threatened by the conflict now engulfing the world. It commands our whole attention, absorbs our very beings. We face a hostile ideology-global in scope, atheistic in character, ruthless in purpose, and insidious in method. Unhappily the danger it poses promises to be of indefinite duration...with liberty at stake...A vital element in keeping the peace is our military establishment. Our arms must be mighty, ready for instant action, so that no potential aggressor may be tempted to risk his own destruction..."

Until the latest of our world conflicts, the United States had no armaments industry. American makers of plowshares could, with time and as required, make swords as well. But now we can no longer risk emergency improvisation of national defense; we have been compelled to create a permanent armaments industry of vast proportions. Added to this, three and a half million men and women are directly engaged in the defense establishment. We annually spend on military security more than the net income of all United States corporations.

This conjunction of an immense military establishment and a large arms industry is new in the American experience. The total influence-economic, political, even spiritual - is felt in every city, every state house, every office of the Federal government. We recognize the imperative need for this development. Yet we must not fail to comprehend its grave implications. Our toil, resources and livelihood are all involved; so is the very structure of our society.

In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex. The potential for the disastrous rise of misplaced power exists and will persist..." (Farewell Address, Dwight D. Eisenhower, January 17, 1961, 34th U.S. President and Supreme Commander of the Allied Forces in Europe during WWII *In: Eisenhower Library*, 2004).

Integration of military and business interests have evolved to the point that they can perpetuate international conflict as a means of driving the economy (Phillips, 2004).

Kinzer (2006) provides an excellent historical overview of American imperialism. The United States post WWII military-industrial complex's imperialistic entry into manipulating governments and economies can be traced back to two incidents in the late 1940s and early 1950s in the Middle East of all places, which, like Africa, is resource rich, while most of its people are poor and anarchy seems to be lurking at every crossroads and corner. Ultimately,

"control over the Persian Gulf⁵²⁵ translates into control over Europe, Japan and China (economic competitors). It's having our hand on the spigot" that controls the flow of oil (Phillips, 2004).

After WW I, the Russian Revolution and the fall of the Ottoman Empire, similar to Africa, the Western powers carved up the Muslim world into "states" that had nothing to do with the traditional boundaries of the indigenous population. They imposed new and alien elites, either royal families propped up by the West or Communist elites propped up by the Soviets, often leading to repressive military dictatorships, which magnified the gap between the rich elite and the impoverished masses, leading to much of the friction that exists at the beginning of the 21st century (Bodansky, 2001; Catherwood, 2004).

⁵²⁵ The two largest sources of oil in the Gulf are Saudi Arabia with 262 billion barrels of proven reserves and Iraq with 120 billion barrels (Phillips, 2004).

13.8.1.1 Incest and the house Of Sa'ud

The Persian Gulf contains an estimated 65% of the world's untapped petroleum reserves. This area encompassing Saudi Arabia, Iran, Iraq, the United Arab Emirates and Qatar is of strategic importance to the West and a source of continual conflict from the invasion and occupation of this region by foreign non-Muslim troops representing the U.S. and its allies; a recipe for recurring violence (Klare, 2001) and recurring terrorism against the perceived aggressors.

Much to the surprise of the British, when Ibn Saud named his new kingdom Saudi Arabia in 1932, he gave all the main oil concessions to the United States and the new company it would create, Aramco, resulting in a long and incestuous relationship (Catherwood, 2004).

In 1933, King Abdel Aziz granted a concession to the U.S. company Standard Oil to explore for oil in the Eastern Province. The joint enterprise was known as the Arabian American Oil Company (Aramco). In 1938, commercial quantities of oil were discovered. By the 1940s, the U.S. began to court the kingdom as it realized the strategic importance of Saudi oil reserves. In 1950, Saudi Arabia and Aramco agreed to a 50-50 profit-sharing arrangement. In 1988, King Fahd, taking full control of the company, established the Saudi Arabian Oil Company, known as Saudi Aramco, to replace Aramco (PBS, 2001). Since 1948, the United States has provided the use of its military as a means of propping the royal family of Al Sa'ud at the expense of the general population, resulting, among other things, in a fall in per capita income of Saudi citizens by more than 60% in the last 20 years (e.g., since about 1980) (Baer, 2003). By 1951, under a mutual defense agreement, the U.S. established a permanent U.S. Military Training Mission in the kingdom, agreed to provide training to the Saudi armed forces and to construct military installations in the kingdom; growing into a longstanding security

relationship (PBS, 2001). As fast as the United States buys Saudi crude oil at a discounted rate, about US\$ 1 less per barrel than the Asians, the Saudi's turn around and spend their profits on U.S. weapons, construction and communications services, increasing from US\$ 56.2 million in 1950 to US\$ 19.3 billion in 2000 (Baer, 2003); half its annual revenue on defense (Baer, 2003). Perkins (2006) goes into some detail over the development of this relationship with the House of Sa'ud through the United States-Saudi Arabian Joint Economic Commission (JECOR) in which petrodollars hired American firms to build up Saudi Arabia. The program was run through the U.S. Treasury Department with virtually no congressional oversight. Middlemen on both sides become rich, including the royal family in Saudi Arabia, as well as politicians from the Washington oligarchy, due to a revolving door allowing them to go into the private sector after leaving government to work for the manufacturers and procurers and/or directly for the Saudis.

"We in the West and the Saudi rulers themselves are in serious trouble. All the ingredients of upheaval are in place: open borders, the availability of arms, political alienation, the absence of a rule of law, a completely corrupt police force, a despised ruling class, plummeting per capita income (and fabulously wealthy rulers to remind the poor of how poor they are), environmental degradation, surly neighbors, and a growing number of young home-grown radicals who care more about righteous murder than they do about living. The kingdom's schools churn out fanatics faster than they can find wars to fight" (Baer, 2003).

The petrodollars were also used to fund the construction of new mosques and Muslim religious schools (*madrasas*) in Saudi Arabia and across the world -- fueled by the strict Wahhabi interpretation of Islam -- that evolved into a network of recruiting schools that were to train Islamic militants (BPS, 2001; Baer, 2003), serving as a catalyst for development of the disciples of terrorism. The Al Sa'ud family pay off Muslim terrorists to leave the royal family of Al Sa'ud alone, the very terrorist organizations who are attacking the West (e.g., Muslim

Brotherhood, Wahhabis, Taliban, etc.) – in many cases angry with how the West has treated the Middle East (Bodansky, 2001; Baer, 2003) . Osama bin Laden is a Saudi by birth, a product of the local *madrasas* (Muslim schools) and universities (studied management and economics) and angered by the U.S. propping up the royal family he accused of sacrificing Islam and the sanctity of Saudi Arabia to infidels for money, bribes and dirty deals; allowing the presence of infidel military troops from the U.S. on Saudi soils, allowing Western values (morality) into the Middle East, as well as materialism; all of which he considers a threat to traditional Islamic society (Bodansky, 2001; Phillips, 2004). Catherwood (2004) comes to similar conclusions. Bodansky (2001) believes that since the Muslim world lacks the military and scientific technologies to take the West head-on, they feel that the only way to confront the situation is through international terrorism.

Though free education (although deteriorating – Bodansky, 2001) and health care exist in Saudi Arabia, there is high unemployment, while the royal family spends state revenue and their kickbacks on palatial mansions around the world, women, booze and armaments among other things (Baer, 2003).

“...at least 10,000 princes from the House of Sa’ud receive stipends running from \$800 to \$270,000 per month while the rest of the fast-growing population sees its opportunities decline. Even where proven reserves are the greatest in the world, productivity has taken a nose dive and per capita income has plunged from \$28,600 in 1981 to \$6,800 in 2001” (Gary & Karl, 2003).

While no one can sanction 911, undertaken mostly by Saudi radicals (15 of 19 hijackers were Saudis - CNN, 2002a), one can clearly understand the anger and rage towards America by the average Saudi. In October, 2001, in a poll of educated Saudis between 25 and 41 years old, 95% supported bin Laden (Baer, 2003).

“Sure, we’ve lost control of our country, and our citizens are slaughtering yours, but you can depend on us to keep your cars on the road and your houses warm. And by the way, you’ll feel better if you don’t think about the unpleasant reality that your oil bank is sitting on dangerously shifting sands” (Baer, 2003).

While the U.S. obtains only 8% of its crude from the Saudis, Saudi Arabia sits on 25% of the world’s proven reserves. Forget democracy and freedom, what is happening in the Middle East, including Iraq, is all about natural resources to the benefit of the West, especially America’s oligarchy. As “popular discontent and upheaval were closing in on the House of Sa’ud” the decision to seize Iraq emerged as a vital underpinning of U.S. foreign policy (Phillips, 2004). According to U.S. Deputy Defense Secretary, Paul Wolfowitz,⁵²⁶

“ ‘for bureaucratic reasons, we settled on one issue...weapons of mass destruction, because it was the one reason everyone could agree on,’ but another reason was that the ousting of Saddam (Hussein, a former U.S. ally against Iran) would make it possible to base U.S. troops in Iraq and remove them from Saudi Arabia’ ” (Phillips, 2004)

that would meet an important al-Qaeda demand, while allowing the U.S. with its military to control the Middle East and the flow of oil⁵²⁷ (Phillips, 2004), thus redrawing the geo-political map of the Middle East. Perkins (2006) hypothesizes that had Saddam Hussein developed the same relationship with the U.S., where petrodollars were poured back into employing American companies to develop

⁵²⁶ Principle architect of Iraq invasion. Under the George W. Bush administration and in 2005, under the same administration, nominated and voted in as President of the World Bank. Forced to step down from World Bank in June 2007 due to controversy over Bank ethics violations (Wood, 2007).

⁵²⁷ Carothers (2007), Sachs (2005), Phillips (2004) raise concern that current U.S. policy in the Middle East is linked not only to oil, but to Christian fundamentalists who in recent years have aligned themselves with the Bush Administration and their belief that current events in the Middle East are linked to the biblical Armageddon, the last decisive battle between good and evil before Judgment Day. In these beliefs, the Israeli state must exist at all costs for this historical biblical scenario to be played out. Christian, Jewish and Muslim prophecies converge, anticipating a great confrontation in the Middle East (Phillips, 2004).

Iraq, there would likely have been no invasion. There is growing concern that in developed capitalist countries, multi- or trans-national corporations (and one could add trans-national NGOs) determine global economic, social and environmental policies of governments (Bond, 2002).

13.8.1.2 United States adventurism in Iran

The second major step in U.S. imperialism that has helped to pave the way in how America relates to Africa and the rest of the world, is the orchestrated overthrow of democratically elected pro-American, but nationalist, Iranian Prime Minister Mohammad Mossadegh by America and Britain in 1953 in favor of putting back into power a puppet government controlled by the dictatorial King Reza Shah, moving from an open free society to one of suppression and brutality.

Mossadegh was *Time* magazine's Man of the Year in 1951 (Perkins, 2006). Perkins (2006) marks 1951 as a decisive moment in history in which the major force in the creation of empires moved from military force, now too risky with the emergence of the Soviet Union as a nuclear power, to covert operations and later, economic manipulation. Mercantilism and control of resources was/is still at the heart of empire building, as it had been from the 16th to the 18th centuries, where those with power and limited resources exploited/exploit those with abundant resources, but no power.

Mossadegh's overthrow occurred because of his nationalization of British controlled oil in Iran, which at the time supplied 90% of Europe's petroleum. The reason behind the nationalization was that the Anglo-Iranian oil company paid off the Shah, while selling the oil for 10-30 times what it cost to produce. Britain had risen to world power largely because of its success in exploiting the natural resources of subject nations. Foreign Secretary Bevin stated that without oil from

Iran there would be “ ‘no hope of our being able to achieve the standard of living we are aiming at in Britain.’ ” (Kinzer, 2003). In 1947, Anglo-Iranian made an after-tax profit equivalent of US\$ 112 million, paying the equivalent of US\$ 2.5 million to Iran. One way they maximized their profits was by their British employers living in luxury homes with green lawns, tennis courts, swimming pools and clubs, while the Iranian workers lived in undeveloped slums with no running water or electricity, few environmental controls, no vacation, no sick leave, no disability compensation and homes made from cobbled oil drums. Britain convinced a reluctant America of a communist threat. Truman refused to do Britain’s dirty work, while Eisenhower appears to have been coerced by misinformation provided by the ambitious Dulles brothers (Allen at CIA and John Foster at the U.S. State Department), driven by power and the perceived communist threat. They took a virtually unknown Central Intelligence Agency (CIA) into what would become a powerful instrument of the Cold War with a *modus operandi* - covert actions to shape the course of world events (Kinzer, 2003; Perkins, 2006). In many instances, the CIA orchestrated who would become the president or prime minister of a particular country, as a means of keeping out the communists or letting in America’s industrialists. The over-throw of the Shah in 1979 led to an anti-American Islamic Revolution which can be linked to holding 52 Americans hostage at the U.S. Embassy in Tehran for 14 months, the rise of radical Muslim fundamentalism, the view of America as “the Great Satan”, the financing of radical groups such as the Hamas and Hezbollah (HizbAllah), the 1983 Beirut bombing that killed 214 marines, the 1996 bombing of Khobar Towers in Saudi Arabia that killed 19 marines and the embassy bombings in Kenya and Tanzania in 1998 (Kinzer, 2003). Bodansky (2001) states that just about all terrorism is state sponsored in one way or another.

“It is not far-fetched to draw a line from Operation Ajax (British/American operation to depose Mossadegh) through the Shah’s repressive regime and the Islamic Revolution to the

fireballs that engulfed the World Trade Center in New York. The World has paid a heavy price for the lack of democracy in the Middle East" (Kinzer, 2003).

Some call this orchestrated "American democracy" resulting in "blowback", "the fierce and terrorist-mobilizing resentment incited by U.S. policies, bombings and covert operations, especially over the last 3 decades" (Phillips, 2004). As will be seen, these two steps set the stage for American imperialism in Africa, putting in puppets, propping up despots and manipulating economies over and over again, first to fight the Cold War and since the 1990s, to mine the natural resources of one of the richest (if not the richest) continents in the World; Africa.

13.8.2 American Imperialism in Sub-Saharan Africa, a Struggle for Control of Francophone Africa

"In Cameroon, Benin, Burkina Faso, Gabon and Niger in 1997, I found abundant evidence of unrestricted raw materials extraction by interests associated with the United States. The people of the oil-producing areas of the Niger River Delta are suffering horrendous atrocities..."

So I see it as a policy of depopulation in Africa. Because what I am talking about is access. That's all. Access to the animals. Access to the game parks and trophy fishing. Access to the minerals. Access to the cheap and replenishable labor pool. Access to uninformed populations to dump inferior and toxic and outdated products on. Access for military adventurism and special forces training and psyops operations. Access to biological and pharmaceutical testing grounds. Access to markets. And while at times it seems contradictory, at times it is, but it's all completely unethical, entirely arrogant and racist. It is driven purely by greed. And the profound human suffering is totally unnecessary" (Snow, 2001 *In: McKinney, 2001*).

"The West, and particularly the United States, is dependent upon the availability of strategic minerals, many of which the U.S. does not produce" (Hartung & Montague, 2001),

Sub-Saharan Africa being a major source of raw materials. According to Alemayehu (2000), strategic metals such as platinum, vanadium, manganese ore and chrome ore come primarily from South Africa and the Soviet Union. From 80-85% of the ferromanganese, ferrochrome, cobalt, manganese ore and metal, chromite and graphite used by the U.S. come from Africa. From 40-100% of germanium, selenium, indium, rhodium, cesium, iridium and phlogopite used by the U.S. in electricity, electronic, photo and optics, come from Africa. From 90-100% of the palladium and chrome chemicals used in the U.S. packaging, medical and chemical industries are from Africa, as well as 100% of the diamonds, corundum, amosite and crocidolite used in gems, abrasives and insulation by the U.S.

13.8.2.1 America's entry into imperialistic adventures in Sub-Saharan Africa

America's entry into imperialistic adventures on the subcontinent began in the 1960s under the Kennedy administration in support of 31 year old Chief of Staff of the Army, Joseph Mobutu Sese Seko, who seized control of power (see Chapter 11, Section 11.6.6.1, The Katanga story, an "African Solution" to democracy thwarted by the "Cold War" and beginning of French/American struggle over a quest for Africa's riches) and continues today by the William (Bill) Jefferson Clinton and Bush administrations for Laurent and then Joseph Kabila (see Section 13.10.3.4, Corporate wars) (Figure 13.3). By the 1990s, the United States had taken over from Britain as the major threat to Francophone interests on the African continent (Madsen, 1999). This lays much of the backdrop for many of the current crises in post-Cold War Africa, in which espionage and politics, as well as "economic intelligence" towards Africa is linked to obtaining an economic advantage, as opposed to Cold War military superiority (Madsen, 1999). Yet at what cost to Sub-Saharan Africa and its people, as former Cold War allies vie for power of Africa's natural resources?

13.8.2.2 America declares the end of France's *chasse gardeé*

In 1995, it was stated in a Washington Times (1995a) article that despite 35 years of independence, Francophone African countries remain French dependencies that are run largely from Paris. The question of who runs a given country is often settled in the Elysee Palace, with key ministries in Francophone African governments being peppered with French technical advisors and a military trained and equipped by France. Under President Francois Mitterrand, there existed an "African Cell" run by his son Jean-Christophe Mitterrand. It was rumored that the Mitterrand family had strong logging interests in Francophone Africa. The French gave these countries stability and their leaders security through a common currency, the *Communauté Financière Africaine* (CFA) franc, and military protection, while the French got an empire run by the French President. Under the current French President, Jacques Chirac, this has continued (Huliaras, 2002 *In: Zack-Williams, et al.*, 2002).

From 1989-94, France's policy towards Africa, as its continental economy declined, can be described as benign neglect. However, from 1994-97, a period of defensive action (Huliaras, 2002 *In: Zack-Williams, et al.*, 2002) took place in an attempt to protect France's sphere of influence over its former African colonies and other Francophone African countries (e.g., Zaire/the Democratic Republic of Congo and Rwanda), many containing important natural resources which America had decided to begin trying to access. This has resulted, directly or indirectly, in resource wars fought by proxies, as both France and its multinationals vie for maintenance of spheres of traditional resource extraction against aggressive moves by the American government and its multi-nationals to take control of these areas (Madsen, 1999). The cost to humanity and development of the continent is untold as these Western powers vie for control.

The 1994-1997 events in the Great Lakes were seen by French politicians as evidence of an American conspiracy to oust France from Africa (Huliaras, 1998 *In: Huliaras, 2002 In: Zack-Williams, et al., 2002; Madsen, 1999*). The victories of the Anglophone Tutsis in Rwanda and the success of Laurent Kabilas forces in Zaire (the Democratic Republic of Congo), who were supported by the United States through Rwanda and Uganda as proxies, were considered by Paris as major defeats (Hugeux, 1997 *In: Huliaras, 2002 In: Zack-Williams, et al., 2002; Madsen, 1999*). France viewed the collapse of its *protégées* in Rwanda and Zaire as part of a UN Anglo-Saxon plot to steal its sphere of influence (Economist, 1997 *In: Huliaras, 2002 In: Zack-Williams, et al., 2002*). France viewed this as part of an American conspiracy against *la francophonie* (Huliaras, 2002 *In: Zack-Williams, et al., 2002*), French culture and influence in Africa. As will be seen below, the resource war in Congo Brazzaville was funded by competing American and French oil companies.

France actually tried to help the Hutu dominated Habyarimana regime in Rwanda halt the invasion of the Tutsis from neighboring Uganda and then helped the Hutu soldiers escape to Zaire with their weapons (Madsen, 1999; Huliaras, 2002 *In: Zack-Williams, et al., 2002*), even going so far as to arm them in Rwanda at the beginning of the 1994 massacres and again in the Democratic Republic of Congo where there were more massacres (Madsen, 1999). When Kabilas began his 1996 invasion of the Democratic Republic of Congo (Zaire), Paris proposed UN international military intervention to protect the Mobutu Sese Seko regime, but the William (Bill) Jefferson Clinton Administration prevented this, as it went against its agenda (Madsen, 1999) as the back door or gateway into the riches of the Democratic Republic of Congo and eventually the Gulf of Guinea. If hundreds of thousands of people died, so what?

Other developments that renewed France's interest in Africa included (Huliaras, 2002 *In: Zack-Williams, et al., 2002*):

- United States post-Cold War economic policies to use American external politics to facilitate U.S. private enterprise penetration into new markets – with the U.S. stating that France's *Chasse Gardeé* (Private Hunting Grounds) in Francophone Africa would no longer be accepted; and
- The disappearance of the colonial generation of French-trained functionaries such as Felix Houphouet-Boigny in Cote d'Ivoire replaced by new leaders, many being U.S.-trained, such as Congo Brazzaville's Pascal Lissouba (see Section 13.10.1.4, Petroleum war, Congo Brazzaville), less willing to “pledge allegiance” to France and looking to develop closer partnerships with the world’s one remaining superpower.

Secretary of State Collin Powell’s immediate departure for oil rich Angola and Gabon (The Gulf of Guinea is France’s Alaska) at the end of the September, 2002 Earth Summit in South Africa must be additional cause for Franco-American strains. In Gabon, Powell met with Omar Bongo and mainly Western NGOs (e.g., WWF, African Wildlife Foundation (AWF) and Conservation International (CI) pledging US\$ 53 million to aid in the development of 12 national parks covering 10% of Gabon’s territory⁵²⁸. He also spoke with Bongo over foreign debt (ANON, 2002a; SENAT, 2002; Jaffe Associates., 2002). When the principal author first visited Gabon (DeGeorges, 1995), the U.S. Economics Officer advised not to come in as an American without French support. Elf (a French oil company) was given non-competitive leases for 13 offshore oil blocks and the U.S.-based firms of Oxypetroleum, Conoco and Mobil pulled out. President Bongo refused to attend an African Trade and Investment Conference because of USA participation, while French officials boycotted the meeting (*Washington Times*, 1995b) (see Section 13.10.1.2, Gabon, France’s Alaska). Thus, Powell’s visit in 2002 must have thrown a real scare into France’s foreign policy agenda, causing even more paranoia as to what the objectives of the Americans are in France’s former African sphere of influence. Certainly, America’s interest in

⁵²⁸ Note: UNEP-WCMC data indicate 4.41% of Gabon in parks and protected areas in 2004 (see Chapter 11, Table 11.10: Sub-Saharan Africa UNEP-WCMC data base of IUCN management categories).

Gabon is not entirely philanthropic, with America hoping to get out of Gabon more than it puts in. With all those American-based NGOs, 70-90% of the US\$ 53 million will funnel back to the USA which, as discussed in Chapter 11 (see Section 11.7.2, Foreign Assistance Conditionalities Good Business for Donor County Not Recipient/Host Country), will be good for America's economy, but will not do much for the poorest of the poor other than to disenfranchise groups like the Pygmies from their natural resources and destroy cultures through the creation of more exclusion zones, regardless of the "community rhetoric" put forth by the Western NGOs [see Chapter 11, Section 11.9, THE NEW SAVIORS OF AFRICA; NGOS and Section 11.10, FOREIGN AID AND THE ENVIRONMENT and Section 11.11.6, Eco-Genocide in Southeastern Cameroon (Division of Boumba-et-Ngoko), the Forest People and the "Dobi Dobi", More Parks and Protected Areas]. In early 2008, the principal author had a half day meeting with a representative of Gabon's national parks, applying to study nature conservation at Tshwane University of Technology. According to Matlands (*pers. comm.*), who is developing a plan for Gabon's national parks network, a policy appears to have existed for a few years that rural communities will remain living in Gabon's protected area network, and be helped to sustainably manage the resources within these areas, including involvement in tourism. While some conservation NGOs accepted this idea openly, others did so reluctantly.

13.8.2.3 American hegemony through contribution of arms and military training in Sub-Saharan Africa

"Since the fall of the Berlin Wall, U.S. arms transfers to Africa have continued, albeit at a slower pace. From 1989 to 1998, the United States provided over \$US 227 million in weapons and training to African military forces, of which over \$US 111 million went to governments that have been directly or indirectly involved in the war in the DRC: Angola, Burundi, Chad, DRC, Namibia, Rwanda, Sudan, Uganda, and Zimbabwe. These figures do not include the \$US 75 million in emergency aid to Rwanda that was

provided in 1994. The United States has repeatedly declared its commitment to promoting peace in the Great Lakes region, and has supported every United Nations Resolution directed toward that goal. Yet the flow of U.S. arms and military training to countries involved in the DRC war has not ceased...During FY 2000, the following countries involved in the war in the DRC or other African conflicts received substantial U.S. training: Chad (\$US 2.9 million), Zimbabwe (\$US 1.4 million), Rwanda (\$US 13 million), Namibia (\$US 5 million), Uganda (\$US 1 million), and Ethiopia and Eritrea (roughly \$US 100,000 each)" (Hartung & Montague, 2001).

"The foundation of a new security structure already exists with EUCOM's (European Command, U.S. Department of Defense) Africa Engagement Plan, which is committed to freedom of navigation, quick response to humanitarian crisis, rule of law, military professionalism, and subordination of African militaries to civil leadership. These operating principles have been exemplified by the formation of the African Crisis Response Initiative (ACRI), the Africa Center for Strategic Studies (ACSS), and the Joint Combined Education Training Program for small unit training" (AOPIG, 2002).

Expansion of the military-industrial complex of America into Africa can also be linked to the African Crisis Response Initiative (ACRI) and the African Center for Security Studies (ACSS). ACRI supposedly trains African troops in peace keeping and humanitarian actions (U.S. Department of Defense, 2001).

"The formation of ACRI was debated by successive U.S. administrations, but its launch without the consent or consultation of Africans created the impression it is primarily an instrument of American foreign policy" (Mburu, 2003).

Mburu (2003) also raises the point that both the Economic Community of West Africa States/*Communaute Economique des Etats d'Afrique de l'Ouest* (ECOWAS/CEDEAO) and the Southern African Development Community (SADC) are more than capable of dealing with regional crises, such as the 2000 floods in Mozambique.

“It is difficult to visualize what ACRI could possibly offer that is outside the capability of the two institutions whose only limitations are the financing and international publicity the American initiative enjoys...ACRI is meant to fill this void but its membership, at least in theory, is open to functioning democracies where the military is under civilian control, a criterion that disqualifies dismembered Somalia, strife-torn Rwanda, Sierra Leone, and the DRC (formerly known as Zaire). Considering that societies under anarchy need security assistance more than orderly ones do, ACRI resembles a feast where invitation is only for those who are not hungry. Participant countries of ACRI include Senegal, Mali, Ghana, Benin, Malawi, Uganda, and Cote d’Ivoire” (Mburu, 2003).

Kenya (ethnic violence and clamp down on political dissents) and Ethiopia (conflicts with Eritrea and western Somalia) were initially barred, but then admitted. Mburu (2003) raises concern that

“admitting countries with unacceptable policies reinforces the suspicion that the real criterion for membership is a country’s geopolitical importance to the U.S. and not good governance as officially posted. The representativeness of the African force is further dented by the abstention of most North Africans (Morocco, Algeria, Tunisia, Libya, Egypt, and Sudan) who suspect America’s insincerity in view of its mixed-signal policy in the Middle East, particularly over Palestinian statehood”.

With regard to ACSS,

“The ACSS aims to support an appropriate military role in democratic governance by offering senior African leaders, civilian and military, a rigorous academic and practical program in civil-military relations, national security strategy, and defense economics...and promote informed and productive inquiry on the military's role in a democracy among non-government civilian leaders, government officials and military officers” (U.S. Department of Defense, 1999).

Similar centers exist at the George C. Marshall Center for Security Studies in Germany, the Asia-Pacific Center in Hawaii and the Center for Hemispheric

Defense Studies in Washington, D.C. (Madsen, 1999; U.S. Department of Defense, 1999).

The Africa Contingency Operations Training Assistance (ACOTA) program was created by the Bush Administration in the spring of 2002 to take the place of the African Crisis Response Initiative (ACRI) in order to provide training in peacekeeping operations and regular military tactics to military units from selected countries in Africa (Kagan, 2003; Volman, 2003). Since 1996, over 8,600 African troops from Senegal, Uganda, Malawi, Mali, Ghana, Benin, Côte d'Ivoire and Kenya have received training through the ACRI program. The training is conducted in the host country by 60-man units of U.S. Special Forces soldiers (Volman, 2003). The most significant difference between the two programs is that ACOTA will include training for offensive military operations, including light infantry tactics and small unit tactics, to enhance the ability of African troops to conduct peacekeeping operations in hostile environments. Under ACOTA, African troops will also be provided with offensive military weaponry, including rifles, machine guns and mortars. This is linked into the African Peacekeeping Program (ARP) (Kagan, 2003; Volman, 2003).

The International Military Education and Training (IMET) program is used to provide professional training to African military officers from 44 countries at U.S. military colleges and other military facilities in the U.S. (Madsen, 1999; Kagan, 2003; Volman, 2003). For instance, since 1965, more than 1,000 Senegalese military officers have trained in the U.S. (U.S. Embassy Dakar, 2004). In Fiscal Year (FY) 2002, IMET expected to provide training to more than 1,600 African officers. African countries that are expected to participate in IMET in FY 2003 include: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Comoros, Cote d'Ivoire, the Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia,

Gabon, Gambia, Ghana, Guinea-Conakry, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, the Republic of Congo, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda and Zambia (Kagan, 2003). Madsen (1999) is concerned about the kind of leadership emerging out of such programs, given the results of the "School of the America's" in Fort Benning Georgia, which is notorious for having produced such repressive dictators and military leaders as Chile's Pinochet, Panama's Noriega and Haiti's Cedras, among others, a school reputed to advocate executions, torture and other human rights violations.

The "Pan-Sahel Initiative" will offer training, vehicles, radios and other equipment to improve security and border surveillance (Blunt, 2004) to Mauritania, Mali, Niger and Chad (Belida, 2004a; Knickmeyer, 2004), designed to enhance border protection and the ability of security forces to track the movement of people, especially in the remote desert frontier regions of the Sahara. Budgeted at a modest \$US 10 million this terminated in 2004 and was followed by an US\$ 80 million budget Trans-Saharan Counter-terrorism Initiative (TSCTI) that links Algeria, Chad, Mali, Mauritania, Morocco, Niger, Nigeria and Senegal to the

"10th U.S. Army Special Forces Group to train military units of partner countries and improve their strategic and tactical coordination with American military and intelligence operations" (Pham, 2007).

In addition, support has been provided by the U.S. State Department and USAID in counter-terrorism (Pham, 2007).

It is believed that U.S. strategic interest in the Sahelian region, stretching from Senegal/Mauritania to the Horn of Africa, has primarily to do with this being a

potential area for terrorism and recruitment thereof, with links to al-Qaeda, and the possibility of this area destabilizing oil rich Algeria to the north and Nigeria/Gulf of Guinea oil producing states to the south (Barth, 2003). In early 2004, the U.S. was considering air strikes of suspected safe havens for al-Qaeda linked armed terrorists groups along the Algeria/Mali border that have been forced out of other countries, such as Afghanistan. In January, 2004, a combined operation saw Malian troops force a suspected terrorist weapons convoy loaded with arms, ammunition and communications gear across the border where it was intercepted by Algerian forces. The U.S. troops in Mali are elite Special Operations forces that can be tasked with actual field missions on an as-needed basis (Belida, 2004b). The major reasons for U.S. concern over this stretch of Africa include:

- The majority of people in this region are Muslim;
- Traditional pastoral (transhumance) and agricultural (fallow) lifestyles are no longer sustainable under current human populations, resulting in major environmental/habitat degradation and a feeling of disenfranchisement and hopelessness among the regions' youth, making them perfect candidates for recruitment by Muslim terrorists (see Chapter 5, Section 5.11.2, Overpopulation, Desertification and Instability, Nigeria and Section 5.11.4, Darfur, Sudan, overpopulation, desertification, ethnicity, conflict and politics);
- The countries struggle to satisfy a generation of restless young men. With some education, but little or no employment, it is radical Islam which offers them a purpose (Blunt 2004);
- Nigeria and Mauritania being among nations that have al-Qaeda cells (Knickmeyer, 2004);
- A key regional terrorist group U.S. officials are concerned about is the “Salafist (Salifist) Group for Preaching and Combat” which is suspected

in kidnapping European tourists traveling in the Sahara Desert in 2003 (Belida, 2004b) and with suspected links to al-Qaeda, is believed to have spread across borders into Niger and Mali (Knickmeyer, 2004). It is now called the Organization of al-Qaeda in Islamic Maghreb;

- Terrorism to the north could impact key oil and gas producers such as Algeria, and now Libya that appears to be coming under the fold of the West;
- There is a mass migration from the Sahel towards West Africa's coastal countries with projections of massive mega-cities. Already the conflict in the Ivory Coast is believed to be partially linked to the massive migrations of *Burkinabé* from the north, exasperating pressures on the economy and limited resource base to support a rapidly growing population, resulting in increased tensions and, today, anarchy from an ethnically and religiously (Muslim north and Christian south) divided country (see Chapter 5, Section 5.7.4.4, Land reform and civil war in the Ivory Coast);
- This migration has the potential to adversely impact the stability of a major oil producer such as Nigeria. A group of young men modeling themselves on the Taliban have recently battled with Nigerian police along the Niger border (Blunt, 2004);
- Niger is becoming important as a source of oil, has one of the world's largest deposits of uranium and other minerals; and
- Chad has become as major supplier of oil via a pipeline through Cameroon to the port of Kribi, all of which must be secured.

Some believe that U.S. military interventions in this region in the name of the “war on terror” are fueling the already existing unrest between Tuareg communities in Niger and Mali over benefits from natural resources and social concerns (Hennessy, 2007). Madsen (1999) believes these programs are a vehicle for extending U.S. military presence throughout Africa and to groom pro-U.S.

military leaders in Africa (Madsen, 1999; U.S. Department of Defense, 1999). France, South Africa, Egypt and Zimbabwe, as well as 50 traditional chiefs from ten West African states are skeptical, seeing this as a “thin end of an American wedge” to ensure Washington’s dominance over the continent’s natural resources. Is this not a form of indirect rule, no different than that practiced in the past by both the English and French (see Chapter 3, Section 3.1, COLONIAL STATE IN AFRICA) (Madsen, 1999). Madsen (1999) argues that

“Africa like other developing areas of the World has entered a new phase of neo-colonial U.S. military-corporate domination. With the end of the Cold War, Africa’s vast natural resources have been opened up to the most unscrupulous bidders and entrepreneurs. The United States, backed by a scavenging Britain and Canada seek to uproot French domination over much of the Continent. By 1998, the Americans and their allies had, for the most part, succeeded in replacing France as the dominant economic force on the Continent.

London was America’s handmaiden in this affair. This has been accomplished, ranging from Dakar, Senegal and Banjul, the Gambia in West Africa to Asmara, Eritrea and Djibouti to Kigali, as well as Rwanda in East/Central Africa by the United States, training and helping to place former soldiers and Marxist guerrillas (e.g., Yoweri Museveni of Uganda, Paul Kagame of Rwanda, Charles Taylor of Liberia; John Garang of Sudan, Eduardo dos Santos of Angola and Yayeh Jammeh of the Gambia) disguised as democrats on the thrones of neo-colonial governments controlled by the World Bank and IMF, whose policies are in turn controlled by the American government and financial institutions”.

For instance, six months after receiving military training in the U.S., 29-year-old Lieutenant Yayeh Jammeh led a coup *d’etat* against democratically elected Sir Dawda Jawara in 1994, while Paul Kagame led his military assault on Rwanda four months after similar training in the USA. In both cases, U.S. support was evident during these aggressions. Additional current and/or recent leaders who have “elected themselves” into the same offices that they shot themselves into,

include Museveni of Uganda, Pierre Buyoya of Burundi, Sani Abacha of Nigeria, Taylor of Liberia and Meles Zenawi of Ethiopia, just to name a few U.S. military assisted “new democracies” of Africa. At an Economic Community of West Africa States (ECOWAS), Nigeria’s Foreign Minister accused ACRI as being an imperialist maneuver to manipulate African armies in a neo-colonialist manner (Madsen, 1999). Is this the “pot calling the kettle black”?

13.8.2.4 Low operational U.S. military bases in Sub-Saharan Africa

“The United States military has access to a number of foreign air bases and ports in Africa and has established “bare-bones” facilities maintained by local troops in several locations...DOD refers to these facilities as ‘lily pads,’ or cooperative security locations, and currently has access to locations in Gabon, Kenya, Mali, Morocco, Sao Tome and Principe, Senegal, Tunisia, Uganda, and Zambia” (CRS, 2007).

The post-Cold War plans for U.S. basing in Africa and elsewhere is to create a web of austere forward operating bases, maintained normally only by small permanent support units, with the fighting forces deploying from the United States when necessary or, if at all possible, to use soldiers from surrounding African countries as proxy fighters with small contingents of U.S. elite special operations forces providing training and technical support. This “family of bases” can go “from cold to warm to hot if you need them”, and can be efficiently built without replicating the “small town USA” of schools and families that have previously accompanied such installations (Robinson, 2003), as in Europe.

These semi-permanent bases might accommodate a brigade of up to 3,000 to 5,000, with an airfield nearby. Up to a dozen of these bases are being considered in Africa. Forward operating locations are being planned, where small infantry or Special Forces units could be landed and built up as the mission requires. Carrier

strike groups and marine expeditionary units will patrol the African coast (Robinson, 2003).

Prospective U.S. base locations include Senegal, Mali, Sao Tome, Algeria, Morocco, Tunisia, Mali, Ghana and Kenya. The major problem will be making sure the economic and security benefits brought by the bases contribute to improving the lives of African people and not corrupt dictators (Robinson, 2003). While both Botswana and Liberia have offered to host an AFRICOM (U.S. military command for Africa) base, strategic partners Algeria and South Africa are reluctant “possibly out of concern over a permanent foreign military presence within their borders” (CRS, 2007).

East Africa and Horn of Africa

Examples of such bases include the use of existing bases in African countries, such as the port of Mombassa, Kenya, as well as airfields at Embakasi and Nanyuki, Kenya were used during the Somali intervention in 1992-1994 (Kagan, 2003; Volman, 2003). An Aircraft refuelling agreement has been arranged with Uganda (Schmidt & Copnall, 2003). The Pentagon arranged to establish the headquarters for the Combined Joint Task Force-Horn of Africa - CJTF (its regional counter-terrorism command center) in Djibouti (Kagan, 2003; Volman, 2003). Along with the headquarters element, 800 U.S. Special Forces troops have set up base at Camp Lemonier outside the city of Djibouti and the amphibious assault ship U.S.S. Mount Whitney, with 600 marines on board, is stationed off shore. In December 2002, 2,400 marines from the 24th Marine Expeditionary Unit, based on ships off shore, conducted military exercises in Djibouti in preparation for the impending war with Iraq (Kagan, 2003; Volman, 2003). The CJTF involves national forces from Kenya, Somalia, Ethiopia, Sudan and Yemen with the aim of detecting, disrupting, and defeating transnational terrorism

(Mbogo, 2004). This seems to fit in with the American policy of using other country's troops, with minimal on-the-ground presence by American troops, already spread thin because of Iraq and Afghanistan (Carafano & Gardiner, 2004).

The use of proxy armies and U.S. military adventurism in Africa continues. In late 2006, Ethiopian military forces invaded Somalia, eventually taking the capitol, Mogadishu, and kicking out the Islamic Court movement in early 2007. The U.S. State Department supported this invasion stating that Ethiopia has "genuine security concerns" from Islamist forces in its eastern neighbor (Gedda, 2006). The Islamic Court movement was brought to power as an alternative to the hated and despised U.S. supported warlords who bribed and terrorized ordinary Somalis (McCrummen, 2006). Although yet to be proven, in the belief that al-Qaeda elements were at large in Somalia, by the end of January 2007, AC-130 gunships were used twice to go after terrorist targets in Somalia. These gunships destroy every bit of life in an area and are not the weapons to use against an individual (Lesser, 2007). One must wonder how many innocent people may have been killed by such a blatant use of force. Somalia remains dangerous with more than 340,000 people fleeing the capitol between February and September 2007 as sporadic fighting continues. The U.S. supports the Somali President's call for a joint African-Arab peacekeeping force, as opposed to an African Union force that is deploying too slowly, to replace the Ethiopian military (Wadhams, 2007a). On the other hand, the Bush Administration is in direct opposition to the U.S. Congress, whose Ethiopia Democracy and Accountability Act would withhold non-humanitarian funds to Ethiopia until democracy and respect for human rights are fully restored (Robinson, 2007).

Botswana, Southern Africa

Madsen (1999) provided evidence that as far back as 1994, the U.S. constructed the Mapharangwane military airbase with a 1,000 foot runway, military barracks, a hospital and empty buildings 89 km (55 miles) northwest of Gaborone, Botswana. The capacity was much larger than what Botswana's current air force needed. It is believed that the purpose of this base is to serve the U.S. in southern Africa on an as-needed basis.

West Africa

"Security is a key obstacle facing the United States in its quest for West African oil. Africans are familiar with the problem. Oil revenues are an attractive prize. Nigeria recently announced that it had foiled a coup plot. Equatorial Guinea's leaders said they were targeted for an attempted overthrow by a group of mercenaries. The leader of Sao Tome and Principe was briefly deposed last year. The United States has stepped up its training of African militaries, partly to help with peacekeeping and to fight terrorism, but also to help secure its oil interests. Charles Snyder, Acting U.S. Assistant Secretary of State for Africa: 'we need to revive, and we will revive, the old African coastal security program, which helps African security forces to protect their shores, as well as their marine resources. And as I pointed out earlier, a lot of this new oil is actually off-shore. There is no one to protect it, unless we build up African coastal fleets' " (Shiner, 2004a).

In West Africa since 9/11, the nature of American military involvement in the vast Saharan expanse of north-west Africa, especially in Algeria, is finally taking shape. In 2003, President George W. Bush gave orders for a massive expansion of U.S. military presence in Africa (Schmidt & Copnall, 2003). The United States has a network of global commands to direct counter-terrorism operations on every continent, except Africa. More than 75% (3/4s) of the countries in Sub-Saharan Africa are managed as a side operation by the U.S. European command, a vestige

of both the continent's colonial legacy and the Cold War. Military strategists, Carafano and Gardiner (2004) recommend the creation of a Sub-Saharan Africa Sub-Command under Central Command whose responsibility already covers the Middle East, Central Asia and the Horn of Africa, since the European Command has paid little attention to Africa.

An Aircraft refuelling agreement has been arranged with Senegal, while the main focus will be on the Maghreb and bordering Sub-Saharan African countries. U.S. army bases are being planned in Algeria and Mali, which U.S. forces could use for training or for strikes on terrorist targets (Schmidt & Copnall, 2003). The construction by the Halliburton subsidiary, Kellogg, Brown and Root, that is billed as a NASA base (believed by locals to be doubling as a U.S. military/CIA listening post) alongside the main airport of Algeria's southern garrison and administrative capital of Tamanrasset, has been in progress for about a year (Barth, 2003).

In early 2004, an anti-terror team accompanied by Deputy Undersecretary of State for Africa, Pamela Bridgewater, arrived in Mauritania to discuss collaboration in the "war against terror" (Blunt, 2004). By February 2004, visits were made by the U.S. commander in Europe, Marine General James L. Jones, to Morocco, Cameroon, Nigeria and South Africa. European Command deputy head Air Force, General Charles Wald, is also traveling to Algeria, Nigeria and South Africa, as well as oil-rich Gabon. The European Command's director of planning, U.S. Air Force Major General Jeffrey Kohler, is visiting Mauritania, Mali and Niger (Belida, 2004a; Knickmeyer, 2004) due to the "the vital importance" of Africa to the overall international security environment committing the U.S. Defense Department to "robust engagement", including military-to-military exchanges intended to enhance cooperation, especially in the global war on terrorism (Belida, 2004a).

Sao Tome and Principe, Gulf of Guinea

Projected to provide 25% of America's oil by 2015 (GPF, 2002; CRS, 2007),

"estimates place potential reserves in the Gulf of Guinea at between 20 billion and 30 billion barrels. Although this pales in comparison to Saudi Arabia's proven oil reserves of 264.2 billion barrels, it still represents the largest single bloc of crude deposits in Sub-Saharan Africa and is well situated in the South Atlantic to supply oil to the United States and Europe" (GPF, 2002).

This then provides another port of entry by the American military to defend its oil interests in the Gulf of Guinea.

There has also been talk of extending the runway in Sao Tome, where the U.S. has major oil interests (Madsen, 1999). BBC (2002), Gary and Karl (2003) and AP (2004) reported that the U.S. Government was considering the construction of a deep water port, some said as a naval base in Sao Tome, as recommended to the U.S. Congress by African Oil Policy Initiative Group (AOPIG, 2002). US\$ 800,000 is being allocated to study the possibility of an airport (AP, 2004), while Reuters (2004) states that the money is being divided between studies of the port and airport. According to the U.S. Trade and Development Agency – USTDA (2004), the grant will be divided into US\$ 450,000 to study the feasibility of a deepwater port and US\$ 350,000 to study the expansion of the airport to make Sao Tome and Principe more accessible for trade and travel.

"According to the London-based *Financial Times*, an Israeli lobby group, the Institute for Advance Strategic and Political Studies, has called for the creation of a U.S. Gulf of Guinea Command, with Sao Tome serving as the naval base" (GPF, 2002).

"U.S. officials denied reports they were planning to establish a naval or military base at Sao Tome, but said the archipelago's location -- 300 km (190 miles) off the coast of Africa and lying

between unstable oil giants Nigeria and Angola -- was of strategic importance. ‘Certainly the U.S. Government recognizes the newfound economic interests in the region and we want to ensure Sao Tome is able to develop them without any undue pressure from other organizations in the region,’ a U.S. defense official said. ‘From a military point of view, Sao Tome is a strategic location for access to the rest of West Africa’ ” (Reuters, 2004).

Thus “America’s policy has changed from defending Africa from communism to preparing it for American investment and exploitation” (Madsen, 1999) and fighting terrorism, often induced by the way it deals with the rest of the world. Cindy Shiner of the Voice of America spells it out very simply,

“But now the United States is engaged in its own version of a scramble for Africa. West Africa – once considered of little importance to U.S. strategic thinking -- is attracting keen attention because of its deep-water resources of petroleum. The key to U.S. energy security lies in the diversity of its supplies. Africa is central to that diversity. Charles Snyder, Acting U.S. Assistant Secretary of State for African Affairs, spoke recently in Washington about rising U.S. national security interests in Africa...” (Shiner, 2004a).

In February 2007, President Bush announced the formation of AFRICOM, a U.S. military command for Africa to be fully operational by September 2008 (Butty, 2007a; Melton, 2007a):

“to coordinate U.S. military activities for almost all of the African continent (except Egypt)...formerly been divided up among U.S. Central Command in the U.S. state of Florida, U.S. Pacific Command in the Pacific island state of Hawaii, and U.S. European Command, located in Germany” (Melton, 2007a).

It will

“coordinate military activities as well as help with humanitarian aid operations conducted by U.S. government agencies such as the State Department and USAID”,

as well as train African peacekeeping forces (Melton, 2007a). According to Theresa Whelan, deputy assistant defense secretary for Africa,

“ ‘The purpose of this command is to help promote greater security, cooperation, and dialogue between ourselves and our African partners. That’s the intent. To build capacity within Africa for security because security is the framework, the foundation, of stability required for economic development, social development. So this isn’t about chasing terrorists around Africa’ ” (Melton, 2007a).

Regardless of the rhetoric, there is some concern that this will be perceived as a hegemonic attempt by the U.S. to create a united continental African military force under its control to fight terrorism and/or control China’s access to the continent’s vast resources (Butty, 2007a). The NGO, Africa Action (2003) is concerned that

“U.S. security cooperation with Africa has taken on new meaning since 9/11. Increased U.S. interest in projecting military force into the Persian Gulf has led to a massive increase in the U.S. military presence in the Horn of Africa. Meanwhile, U.S. concern with West Africa as an alternative oil source has raised the prospect of a U.S. base on the island nation of São Tomé. These recent developments indicate a return to a U.S. policy that treats Africa in purely geo-strategic terms, and seeks to form alliances with African governments according to their value in the framework of the U.S.’s ‘war on terrorism.’ It is critically important that the U.S. relationship with Africa not return to this dangerous Cold War model. A U.S. commitment to promoting peace and stability in Africa can do much to enhance international security”.

Navy Rear Admiral Bob Moeller, helping to arrange AFRICOM explained, “ ‘There is clearly an energy component...Overall, Africa is growing in global strategic importance’ ” with Africa’s security becoming a national security issue for the United States (Harris, 2007).

Given the above, it may be irrelevant what anyone or country thinks. Africa has literally been cordoned fenced in razor wire by the American military-industrial complex. This includes both military bases strategically located around the continent, as well as U.S. militarily trained armies and leaders. One could argue that resource rich Africa has been annexed as America's new colony in such a shrewd and clandestine manner that it is not evident to the naked eye, as proxies in the form of Africans are taking the lead while American troops lay in the background providing training, decision-support and direction. This has been the Islamists fear all along and one of the driving forces behind their terrorist activities that

“it has become clear that the American plan in Africa is aimed at establishing an American belt to succeed the Islamic belt” (Bodansky, 2001).

13.8.2.5 French American Economic Rivalries Bridge Africa and the Middle-East

The American onslaught of the African continent over traditional French domains can help explain the friction between America and France over Iraq, as America muscles in to take control of this country's economy. The Boer War historian Thomas Pakenham, author of *The scramble for Africa: The white man's conquest of the dark continent from 1876 to 1912* (Pakenham, 1991) has likened the 1899-1902 Anglo-Boer conflict with what is currently raging in Iraq, where today and then, France was a key player (News 24, 2004):

“ ‘I precipitated the crisis, which was inevitable, before it was too late...It is not very agreeable, and in many eyes, not very credible piece of business to have been largely instrumental in bringing about a big war’ (Sir Alfred Milner, British High Commissioner to Lord Roberts, June 6, 1900 *In: Packenham, 1991*).

- France had major economic interests in both wars and in both cases, was pushed out by an Anglophone country, Britain in the Anglo-Boer War and the U.S. in Iraq;
- Both wars were avoidable. Neither war was forced on Britain or the United States;
- Victorian authorities argued that late 19th century arms imports (French artillery and German rifles) were making the Boers stronger - a threat to the subcontinent (for the imperialist British), while Bush argued sanctions were failing and that Saddam Hussein would soon regain weapons of mass destruction with which to threaten his neighbors;
- Both wars also involved strategically important resources, oil in the case of Iraq and the Victorian equivalent, gold, in South Africa. At the time the Zuid Afrikaanse Republiek (ZAR) was the world's largest single supplier of gold to states that had just gone onto the gold standard, while Iraq had oil reserves second only to Saudi Arabia. In each case we have a superpower saying 'here is a strategically important resource we need to control. If we can't have it we will have to grab it;'
- The British then and the Americans in 2003 also convinced themselves that they were not occupiers, but liberators, liberating the Boer and *Uitlander* (British immigrants to the Rand gold fields refused equal rights and the right to vote in the Transvaal Republic after they had lived there for five years) from the iron heel of Paul Kruger, and Iraqis from the iron heel of Saddam Hussein; and
- They also convinced themselves it would be a short, sharp war and that once they had occupied Pretoria and Baghdad their new subjects would acquiesce. Neither foresaw the guerrilla war that came instead of the expected victory (News 24, 2004).

Already Halliburton, U.S. Vice-President Dick Cheney's former company and a score of other American companies, have been given major contracts in Iraq's oil industry.⁵²⁹ Prior to America's take over of Iraq, France controlled over 22.5% of Iraq's imports. French total trade with Iraq under the oil-for-food program was the third largest, totaling US\$ 3.1 billion since 1996, according to the United Nations. In 2001, France became Iraq's largest European trading partner. Roughly, 60 French companies did an estimated US\$ 1.5 billion in trade with Baghdad in 2001 under the UN oil-for-food program. France's largest oil company, Total Fina Elf, had negotiated extensive oil contracts to develop the Majnoon and Nahr Umar oil fields in southern Iraq. Both the Majnoon and Nahr Umar fields are estimated to contain as much as 25% of the country's oil reserves. The two fields purportedly contain an estimated 26 billion barrels of oil. In 2002, the non-war price per barrel of oil was US\$ 25. Based on that average, these two fields have the potential to provide a gross return near US\$ 650 billion. France's Alcatel company, a major telecom firm, was negotiating a US\$ 76 million contract to rehabilitate Iraq's telephone system. In 2001, French carmaker Renault SA, sold US\$ 75 million worth of farming equipment to Iraq. The top three suppliers of weapons from 1981 to 2001 were Russia, China and France, respectively (Satterlee, 2003).

13.8.3 France's Reaction to U.S. Incursions into Africa

France's reaction to this American onslaught in Africa was to take a proactive role in normalizing relations with Africa and in expanding their sphere of influence beyond their former colonies into countries (Huliaris, 2002 *In: Zack-Williams, et al., 2002*) such as Zimbabwe and South Africa. In 1998, Chirac visited Namibia, South Africa, Mozambique and Angola. Today, non-Francophone countries in Africa account for more than 50% of France's financial

⁵²⁹ U.S. led invasion of Iraq on March 2003. By December 2004, Halliburton Iraq contracts exceeded US\$ 10 billion (Waxman, 2004).

exchanges with Africa. In Angola, Elf accounts for 20% of the 700,000 barrels/day of oil production (Graham, 1998 *In:* Huliaris, 2002 *In:* Zack-Williams, *et al.*, 2002). There has been friction between Portugal and France, when Senegalese and Guinean troops invaded Guinea-Bissau to restore order after a coup *d'etat* in 1998. France had a fall out with South Africa over the idea of French spheres of influence in Francophone Africa and South Africa over southern Africa, the principle of *complementarité*. Even so, South Africa remains on friendly terms, being France's largest Sub-Saharan African market, while France is the 6th largest investor in South Africa (Mills, 1998 *In:* Huliaris, 2002 *In:* Zack-Williams, *et al.*, 2002).

However, France's sphere of influence over Africa was hampered by a series of policies that hurt relations. In some cases, this looks like smoke and mirrors, with France continuing to maintain considerable influence (Huliaris, 2002 *In:* Zack-Williams, *et al.*, 2002):

- A tough anti-immigration policy, feeling that immigration destroys national culture and globalization takes away jobs. France already had a large fluid North African and Francophone African population, with many countries' economies heavily dependent on remittances from sons and daughters living and working in France (e.g., the Senegal River Basin in West Africa). This anti-immigration sentiment will likely increase after the 2005 riots across France in and around the *bidonvilles* (slums) by North and Sub-Saharan African immigrants.
- The 50% devaluation of the West/Central African CFA currency from 50 CFA/1 FF to 100/1 in 1994, something that had stood since 1948 and had subsidized consumer imports of Francophone Africa's political elite.
- Reduction in foreign assistance in the 1990s.

- Radical reform of the French military in 1996, resulting in the closure of the military base in the Central African Republic, the pull-out of troops in Gabon and Chad, a reduction of French troops in Djibouti from 3,200 to 2,600 and a reduction in military advisors with the creation of an “African Peace Keeping Force” to take its place – though France finds itself embroiled in the Cote d’Ivoire in 2003/4 (part of *La Force d’Action Rapide*) – a 44,500 rapid deployment group for Africa based in France. The African peace keeping force with a mandate from the UN is staffed by French advisors and is seen as an extension of French power in Africa.

It is also believed in some cases that internal disagreement within the French administration over its foreign policy hampered prompt reaction. For instance, when Mobutu Sese Seko was ready to fall in Zaire (the Democratic Republic of Congo), one of his closest allies (France) would not commit itself to directly intervene, unwilling to bear the risks and costs of a potentially disastrous operation. France’s internal security services, *Direction la Surveillance du Territoire* (DST) and *Direction Générale de la Sécurité Extérieure* (DGSE), were not only bitter rivals on foreign policy, but disagreed over the use of mercenaries to back Mabutu back in 1996/7, with DST backing the use of mercenaries (Pech, 2000 In: Musah & Fayemi, 2000). As will be seen in Section 13.8.6.9 (The French connection), France used the Hutu as a proxy in an attempt to stop America’s proxies - Rwanda and Uganda – from moving in and overthrowing Mobutu Sese Seko and taking the Democratic Republic of Congo (Zaire).

President Jacques Chirac⁵³⁰ took it upon himself, against current government policy, to run an African strategy out of the Elysee Palace (the President’s office), since he had lost influence over domestic policy due to a divided government, resulting in cohabitation with Lionel Jospin of the Socialist Party as prime

⁵³⁰ There is a saying in Cameroon that “the Francophone African country presidents are students of President Jacques Chirac of France and President Paul Biya of Cameroon is his best student”.

minister. The Franco-African summits that began in the 1970s with only Francophone countries, by 1998 included almost all of Africa's leaders in an attempt to expand its sphere of influence on the continent. This included the invitation of President Robert Mugabe of Zimbabwe, considered a pariah by the West with imposed travel bans, frozen accounts and exclusion from the Commonwealth, being invited to the February 2003 Franco-African Summit in Paris. The Elysée, rather than the government, had regained a strong foothold in Africa. Similar to America's ACRI, since 1977 France has been training and arming African armies under the name Reinforcement of African Capacity to Maintain Peace (RECAM), now expanded into non-Francophone countries and, like ACRI, under the guise of the UN in the name of training African Peace Keeping Forces (Nabakwe, 2002).

France is obliged to continue these relationships out of concern for (Huliaris, 2002 *In: Zack-Williams, et al.*, 2002):

- 1) Maintenance of *la francophonie*, the cultural and linguistic identity on the African continent;
- 2) Mediterranean security and concern over terrorism linked to Islam and conflicts in the south (e.g., between Egypt and Sudan, Libya and Chad, Mauritania and Senegal, Morocco and Algeria over the Western Sahara, and the Tuareg issue in Algeria), forcing Paris to maintain relations with the Sahel;
- 3) More than 200 French companies and *Les expatriés* doing business with the continent, (one reason why France was obliged to send troops into the Ivory Coast to protect the French stronghold of Abidjan and to evacuate French citizens up-country); and

- 4) Africa also providing strategic raw materials to France, necessary to maintain its economy (e.g., oil in Gabon) (Smith & Glaser, 1992 *In: Huliaris* 2002 *In: Zack-Williams, et al.*, 2002).

La Voie Francaise (French Channel or Road into Africa) in the era of globalization will remain important in helping to assure France's significant engagement in African affairs (Huliaris, 2002 *In: Zack-Williams, et al.*, 2002) against the onslaught of the Americans, but at what cost to Africa and Africa's people, as these two superpowers vie for Africa's wealth?

13.8.4 South Africa's Reaction

Although, the economic war for Africa's resources is most visible between the Americans and the French, one cannot ignore the role of Africa's lone superpower in this battle. South Africa is the continent's economic powerhouse. While South Africa represents only 3% of the continent's surface area, it accounts for 40% of all industrial output, 25% of the GDP, more than 50% of electricity generated and 45% of mineral production (Wadula, 2005). In 1984, South Africa's global share in the production of ores included iron (43.4%), zinc (38.7%), manganese (50.3%), chromium (83.7%), rutile (38.1%), vanadium (100%), antimony (85.4%), silver (40.2%), uranium (44.4%), gold (96.1%), magnesite (60.4%) and iron pyrite (52.1%) (Alemayehu, 2000). Many European (e.g., Bayer, Daimler Chrysler, BMW,⁵³¹ Volkswagen), American (e.g., Johnson and Johnson, General Motors) and Japanese (e.g., Toyota, Nissan), as well as multi-nationals (e.g., De Beers, Anglo-American), have major corporate investments based out of South Africa. South Africa is highly urbanized and industrialized with most of the technological tools available to the West. It is also the last country on the subcontinent that can feed itself, as well as a large portion of southern Africa.

⁵³¹ Bavarian Engine Manufacturing/*Bayrische Motoren Werke* (BMW).

Additionally, South Africa may be one of the only global superpowers that have a vested interest in seeing the rest of the subcontinent develop in order to stop the tremendous inflow of illegal aliens. South Africa need take a back seat to no one.

South Africa saw these American programs as an attempt to dictate to Africa and themselves as a regional leader. Nelson Mandela rejected ACRI, saying,

“ ‘A force which is intended to deal with problems in Africa must not be commanded by somebody outside this continent. I would certainly not put my troops under somebody who does not come from Africa’ ” (Madsen, 1999).

Led by South Africa, the South African Development Community (SADC) is pushing for a unified stance against AFRICOM. The feeling is that AFRICOM, in looking out for American interests, could push African countries into conflicts that are not their own, or turn them into spectators on their own continent. The feeling is that Sub-Saharan Africa’s developmental needs include overcoming poverty and turning failed states into functioning ones, issues that military forces can do little about, especially foreign forces (Barber, 2007a).

South Africa realizes that this is no longer an ideological, but an economic war, which threatens their share of dominance on the continent. The “randlords” and a newly emerging black entrepreneurial class of South Africans are calling the shots in post-Apartheid South Africa. Multiracial South Africa would abide by its old Afrikaner tradition of providing arms to anyone willing to pay the price and use its influence, as in the Democratic Republic of Congo to push out the Americans in favor of its own multi-nationals (Madsen, 1999) (see Section 13.10.3.4, Corporate wars). South African firms, such as Executive Outcomes (EO) (mercenary), GMR (arms dealer) and Yurand Air (gun running air service), have been implicated from Angola to Congo Brazzaville, the Democratic republic of Congo and the Ivory Coast in military training and arms sales. When a 1997

cabinet order forbid private companies from providing military services without government approval, Executive Outcomes officially ceased operations, but its parent offices in Pretoria, Strategic Resources Corporation, continued to operate a world-wide network of firms, including Lifeguard,⁵³² Saracen⁵³³ and Sandline (Madsen, 1999). The “second scramble for Africa” was on and as throughout history, “all’s fair in love and war”.

13.8.5 China in the Back Door

Though this book will not go into great detail, while France and the USA vie for control of the Congo Basin, China may be slipping in the back door in its penetration of Sub-Saharan Africa, which has become geopolitically important to the future growth of this emerging economic and military superpower. Over the last ten years, there has been an important penetration of China into the subcontinent. The U.S.-based Council on Foreign Relations published a report in December 2005 entitled “More Than Humanitarianism: A Strategic U.S. Approach Towards Africa” indicating

“ ‘that Africa is becoming steadily more central to the United States and the rest of the world in ways which transcend humanitarian interests,’ ” raising concern that “ ‘all across Africa today, China is acquiring control of natural resource assets, out-bidding Western contractors on major infrastructure projects, and providing soft loans and other incentives to bolster its competitive advantage’ ” (Sorbara, 2006).

“(China’s) Involvement in the region is expected to expand after the launch in 2005 of the New Asian/African Strategic Partnership. The program has been set up to improve trade and investment opportunities between the Southern African region and Asian countries...One of the leading countries which is expected to profit from this new arrangement is South Africa. Overall trade and

⁵³² Address not found.

⁵³³ Address not found.

bilateral investments between China and South Africa remain minimal, yet the latter's technology in the energy sector and Sasol's strong refining and gasification infrastructure will be vital to China's future development. In terms of technological expertise, China is looking at South African coal liquefaction methods which seek to form oil from coal...The state-owned China National Petroleum Corp. (CNPC) is currently developing oil projects in Chad, which has diplomatic ties with Taiwan. Chinese oil companies are also signing contracts in West Africa's other key oil producers, such as Nigeria, Equatorial-Guinea, Congo Brazzaville and Gabon. Other countries like Ivory Coast, Mauritania and Niger have also been identified as future areas for cooperation by Beijing...Trade between Africa and China has increased by nearly 50% this year compared to 2003, which is significantly greater than the growth in Chinese trade with any other area in the world over the same period. The London-based Africa Confidential newsletter recently published fears that doing business with China will make African governments more corrupt. China is paying with large sums of advanced credit or loans for infrastructure development, making it more difficult to ensure that oil revenues benefit the people of the countries that produce the oil" (Widdershoven, 2004).

Hilsum (2005) raises similar concerns about China being seen by Sub-Saharan African countries as an alternative to G-8 countries, since corruption and good governance are a non-issue. The danger is that countries auction off their vast resources today (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife - Impacts of Land Reform on Wildlife and the Environment & Section 13.10.1.4, Petroleum war, Congo Brazzaville), much of this money being diverted into overseas bank accounts by elite, leaving nothing for future development. Junger (2007) raises similar concerns about oil-rich African countries taking Chinese loans today secured by future oil revenues with much of this money returning to China, as with Western foreign aid, through Chinese construction and exploration companies. By the end of 2005, China will overtake Britain as Africa's third largest trading partner (Hilsum, 2005).

“Trade between China and Africa has quadrupled since the beginning of this decade. China is now Africa’s third largest commercial partner after the US and France, and second largest exporter to Africa after France...Like the former colonial countries China backs its trading relations with aid, debt relief, scholarships, training and the provision of specialists...China is now making strategic trade deals throughout Africa. It gets copper from Zambia, cobalt and copper from the Democratic Republic of Congo, timber and oil from Congo Brazzaville, iron-ore from South Africa, and food from Tanzania, to name but a few. It is now the world’s largest consumer of copper, ahead of the US, and the worldwide rise in many commodity prices is largely driven by Chinese demand...Like the US, China is looking to diversify its oil supplies away from the Middle East and now gets between 25 percent and 30 percent of its oil from Africa, mainly from Sudan, Angola and Congo Brazzaville...The US Department of Energy has registered concern over China’s willingness to deal with regimes to which it has given pariah status” (Smith, 2006).

In early 2006, China issued its “African Policy Paper” that outlines its plans for the continent, with the “one China principle” (not recognizing Taiwan) being at the basis of this relationship, along with the policy of mutual economic self-interest, especially access to vital natural resources to drive its ever-growing economy. Where the West sees poverty and despair, China sees opportunity. In addition to trade and investment relations, like the West, it involves military training and defense. It is also investing in sectors that Western aid agencies and private investors have long neglected, including physical infrastructure, industry and agriculture (Sorbara, 2006).

Large numbers of Chinese are studying at South African universities, and one can be assured they have come for business purposes, not for sunshine. For instance, in 2006 out of 48,597 students, there are 113 students from Asian countries, just about all Chinese and only two North Americans, both from the United States, attending Tshwane University of Technology, South Africa (SMS, 2006). China

“recently agreed to bring some 10,000 African students to China on scholarships” (Leggett, 2005). Johannesburg, South Africa and Windhoek, Namibia already have “China Towns”, while every small town in Namibia has a Chinese shop, as do many of the shopping centers in South Africa.

“In oil-rich Nigeria, China is rebuilding the railroad network. In Rwanda, Chinese companies have paved more than 80% of the main roads. In more than a dozen African countries, Chinese firms are searching for oil and gas and rebuilding electricity grids and telephone networks. Chinese companies own one of Zambia's largest copper mines and run a major timber operation in Equatorial Guinea. In tiny Lesotho, Chinese businessmen own and operate nearly half of all the supermarkets and a handful of textile companies” (Leggett, 2005).

Nearly 700 Chinese companies operate in 49 African countries; Chinese trade with Africa projected to reach US\$ 30 billion by 2006 - triple the level five years ago (Smith, 2006). The U.N. estimates that annual trade by Chinese companies with 48 African countries has grown fivefold since 2000 to US\$ 56 billion. In South Africa alone Chinese imports increased from US\$ 2.4 billion in 2003 to US\$ 6.7 billion in 2006 (Hill, 2007). In fact, much of Africa's 5.5% economic growth in 2006 is attributed to China's demand for its oil, natural gas, timber, copper and other natural resources (Harris, 2007). In the next five years, China-Africa trade is expected to surpass US\$ 100 billion (Sorbara, 2006; Junger, 2007), which in addition to resource extraction, includes everything from construction of fish processing plants in Namibia and Gabon, commercial farming in Zambia, Zimbabwe and Tanzania, a beach resort/casino, tractor factory and sugar plant in Sierra Leone, a Nigerian communications satellite, a textile factory in Zambia, investments in power stations, low cost housing projects, cassava plantations, an agro-research centre, an HIV/Aids medicine factory and a medical equipment factory in Nigeria (Sorbara, 2006) and arms to Sudan (Smith, 2006) among others.

However, much of China's interest in Sub-Saharan Africa is all about Africa's natural resources, especially oil (Goodman, 2004; Hilsum, 2005; Junger, 2007), but also timber and minerals (Hilsum, 2005; Smith, 2006). Under the regime of Charles Taylor, China bought tropical hardwoods, with the money being used to buy arms. In Gabon, China is buying up tropical hardwoods and prospecting for oil in a nature reserve (Junger, 2007). In the DRC, children work in Chinese-owned cobalt mines (Junger, 2007). China's 1.3 billion people make up 20% of the global population, with an economic growth greater than most First World countries at between 10%/year (Diamond, 2005) and 11%/year (Junger, 2007). With China's rapidly growing resource hungry economy, if its population reached First World standards this would approximately double the world's human use of natural resources (Diamond, 2005). With a declining domestic output at the largest of its domestic oil fields (Goodman, 2004), China is looking outside of its borders. Since 1993, and for the first time in its 5,000 year history, China is dependent on imported goods, such as oil, to drive its economy (Guo, 2002; EIA, 2004; Luft, 2004).

In 2003, for the first time, China has surpassed Japan as a global consumer of oil at 5.56 million barrels per day (mbd), second only to the U.S. By 2025, China's oil demand is projected to reach 12.8 mbd, with net imports of 9.4 mbd or 74% of its total demand being imported (EIA, 2004; Widdershoven, 2004). Guo (2002) estimates that "by aggressively exploring and developing fields, crude oil output in China is expected to reach 0.2 billion tons in 2020, meeting the 50% of the crude oil demand". China's oil imports have increased from 6% of its oil needs a decade ago to 33% in 2004 and projected to increase to 60% by 2020 (Goodman, 2004). China is projected to be the source of 40% of the world's oil demand growth over the next four years (EIA, 2004; Widdershoven, 2004). Likewise, China currently imports 45% of its iron ore and 44% of its requirements for ten nonferrous metals. It is the world's leading consumer of copper, using 20% of the

world's supply (Areddy, 2005). Sub-Saharan Africa is an obvious source of these resources.

"Since 2000, China's trade with Africa has nearly tripled to almost \$US 30 billion (23.1 million euros). In 2004, China spent almost \$US 10 billion on African oil, accounting for nearly 33% (one-third) of its total crude imports. That is twice as much as it imported from Saudi Arabia, traditionally one of Beijing's biggest suppliers" (Leggett, 2005).

China obtains 31% of its oil from Africa (Junger, 2007). China has become a key player in Sudan's oil (EIA, 2003; Goodman, 2004; Widdershoven, 2004). Leggett (2005) estimates that Sudan currently provides China with 5% of its oil imports, while Junger (2007) places this figure at 7%. Hilsum (2005) estimates that 60% of Sudan's oil goes to China with the potential to meet 9% of China's oil demand, "while Chinese companies are involved in nearly all new oil exploration, production and refinery projects" (Hilsum, 2005). Junger (2007) estimates 80% of Sudan's oil goes to China. The state-owned China National Petroleum Corporation (CNPC) owns 40% (the largest single share) of the Greater Nile Petroleum Operating Company, a consortium that includes Malaysian and Indian firms and Sudan's national company. The CNPC joined with Sudan's Energy ministry to build the country's largest oil refinery and in 2003, investing US\$ 300 million to double production. The consortium's Heglig and Unity oil fields produce 350,000 barrels/day. The CNPC owns part of a field in southern Darfur and 41% of a field in the Melut basin that is expected to produce 300,000 barrels/day by the end of 2006. China's Sinopec Corporation is building a pipeline from this complex to the Red Sea, where China's Petroleum Engineering Construction Group is building a tanker terminal (Goodman, 2004) (see Section 13.10.1.6, Oil-scorched earth Sudan). Chinese firms also have oil concessions in Kazakhstan, Peru, Azerbaijan, Venezuela, Iran and Iraq (Ahrari, 2003; EIA, 2004).

"West Africa, Libya, Sudan and even South Africa have become key areas that Beijing has targeted in its global crusade for crude oil, natural gas and even refining assets and petrochemical products...In 2001, around 25% of Angola's crude oil exports went to China" (Widdershoven, 2004). In Angola "China has become a major buyer and an increasingly active investor" (Leggett, 2005). In 2004, "China's export bank, Exim Bank, extended a \$US 2 billion line of credit to the Angolan government for infrastructure projects. In return for a low interest rate and a generous repayment schedule, Angola agreed to provide 10,000 barrels of oil a day and to award large construction contracts to Chinese firm" (Hilsum, 2005).

A new consortium, jointly controlled by the Angolan government-run Sonangol oil company and China's Sinopec, will build a 240,000 barrel per day refinery, while in 2006 Angola accounts for 13% of China's crude oil imports, making it the second largest consumer of Angolan crude oil after the United States. Meanwhile, 20 leading Chinese firms operate in Angola (Sorbara, 2006).

Of particular concern is China's willingness to use its seat on the UN Security Council to protect repressive regimes in Africa from economic sanctions (Sorbara, 2006). When Ethiopia went to war against neighboring Eritrea in the late 1990s, the U.S. responded by evacuating Peace Corps volunteers, scaling back military aid and issuing a security warning to U.S. citizens and companies, while China reacted in an opportunistic manner (Leggett, 2005).

"It dispatched even more diplomats, engineers, executives and teachers to Ethiopia. New aid grants soon rolled in, followed by bank credits for Chinese companies operating there. Today, China's influence in Ethiopia is overwhelming. Its embassy is among the largest in the country and hosts more high-level visits than any Western mission. Chinese companies have become a dominant force, building highways and bridges, power stations, mobile-phone networks, schools and pharmaceutical plants. More recently, they have begun exploring for oil and building at least one Ethiopian military installation" (Leggett, 2005).

China is also building the controversial 180 meter high Takazee Dam in Ethiopia on the Blue Nile that is soon to be completed (Leggett, 2005) (see Section 13.11, AFRICA'S POTENTIAL WATER WARS), while the China Exim Bank, along with various Arab funds, is financing the Merowe Dam along the Nile River, Sudan, with construction by Chinese and European companies, including Lahmeyer International,⁵³⁴ Alstom,⁵³⁵ and ABB.⁵³⁶ Local residents have protested, being displaced by this dam, and Bedouin pastoralists have been denied traditional access to the river. In April 2006, gross human rights violations occurred when the military fired on local people gathered at a school to discuss the dam, killing three and injuring 10-50 (some say 30 seriously) (IRN, 2006a; Sudan Tribune, 2006a). An estimated 70,000 people will have their lands submerged by the Merowe Dam (Hoebink, 2007).

Its Exim Bank will also provide a US\$ 2.3 billion loan to construct the M'panda Ncua hydroelectric dam, power station and 1,540 km of transmission lines between Tete and Maputo (AllAfrica, 2006; Macauhub, 2006) (see Chapter 7, Section 7.10.7.3, Kariba and Cahora Bassa Dams, Zambezi River).

⁵³⁴ Lahmeyer International GmbH, Friedberger Str.173, 61118 Bad Vilbel, Phone: +49 6101 55-0, Fax: +49 6101 55-2222, E-Mail: info@lahmeyer.de, <http://www.lahmeyer.de/>.

⁵³⁵ Appears to be a multi-national company specializing in power and transport world-wide, <http://www.alstom.com/home/index.EN.php?languageId=EN&dir=/home/>.

⁵³⁶ ABB Ltd, involved in power and automation technologies, Affolternstrasse 44, P.O. Box 8131, CH-8050 Zurich, Switzerland, Tel. +41 (0)43 317 7111, Fax +41 (0)43 317 4420, <http://www.abb.com/global>.

“It is all part of Beijing’s broad push into Africa. Aiming to secure access to the continent’s vast natural resources, China is forging deep economic, political and military ties with most of Africa’s 54 countries” (Leggett, 2005).

“State-run Chinese concern Sinopec, Total Gabon and the Gabonese government signed several agreements which guarantee China a steady flow of Gabonese oil” (Widdershoven, 2004).

While the U.S. and Britain impose sanctions on the Mugabe government in Zimbabwe, China has opened direct flights between the two countries (Leggett, 2005) and sold it US\$ 240 million in arms (Junger, 2007) (see Chapter 5, Section 5.7.4.1, Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife, Impacts of Land Reform on Wildlife and the Environment & Chapter 10, Section 10.4.6.4, Zimbabwe). China National Aero-Technology Import and Export Corporation (CATIC)

“recently signed a \$300 million contract to rebuild Zimbabwe’s electricity grid. It has a raft of other deals in the pipeline -- including possible military aircraft sales” (Leggett, 2005).

Yet, despite the developments listed above, analysts believe that the overall impact of Chinese companies in Africa will be limited because they do not have the financial power or technology to access the continent’s biggest oil fields, which are offshore.

‘A lot of the new oil that is being brought online is being developed in deep offshore waters and a lot of those fields are only capable of being exploited by western companies both because of their access to proprietary technology as well as the large amounts of financial capital that are needed to exploit those fields,’

stated Ian Gary, an oil specialist with U.S.-based aid group, Catholic Relief Services (Widdershoven, 2004). It is just this limited access to oil that some see as driving China to support brutal, corrupt, dictatorial regimes such as Sudan, Iran

and Burma. Some see this being driven by the West's dominance of the more easily accessible sources of oil, while controlling the technologies to obtain the harder to reach oil. Only 23% of the world's known oil reserves are open for ownership. When, China offered US\$ 1 billion for the American oil company UNOCAL, as a means of breaking into Western oil markets, there was such an uproar by the U.S. Congress that a lower bidder was accepted over China, accelerating China's African strategy. A long-term solution to Darfur may very well require a global energy strategy that allows China access to the world's oil wealth to meet its oil needs increasing at 10%/year, which it needs to drive its economic growth (Junger, 2007).

Chinese trade with Sub-Saharan Africa has also had a major adverse impact on the nascent textile industry in Southern Africa (see Section, 13.13.6.2, AGOA) and is based upon low wages, poor working conditions and poor environmental controls. In the DRC, children work in Chinese-owned cobalt mines (Junger, 2007). According to the World Bank, four of the 10 smoggiest cities on Earth are in China and an estimated 710,000 to 760,000 Chinese die each year due to toxic air and water (The Washington Post, 2007).

13.8.6 Former Cold War allies vying for power in the Great Lakes Region

“If there is one thing sure in this world, it is certainly that it will not happen a second time” (Primo Levi, 1958, Auschwitz Survivor *In: Gourevitch, 1998*).

13.8.6.1 Colonial origins of ethnicity in Rwanda

As discussed in Chapter 1, European biases of a superior white-in-origin race, the Tutsi, ruling over an inferior Bantu race, the Hutu, institutionalized and legitimized a growing cleavage between these socio-economic groups.

Traditionally, the lines between the cattle-owning aristocratic Tutsi or “market dominant minority” and the Hutu majority were permeable, both speaking the same language, inter-marrying and with economic mobility, where a successful Hutu could become a Tutsi. (Gourevitch, 1998; Chrétien, 2003; Chua 2003).

“There is now ample evidence of what has been called the ‘invention of ethnicity’ by which is meant the ways in which it was constructed and instrumentalized during the colonial period...the invention of modern ethnicity was coincidental in time with the imposition on the continent of the colonial political structure – itself modeled on the European state. So it was the colonial state which formalized the ethnic map and conspired to define the relationship between ethnicity and politics...What has happened since independence, has been the working through of the practical consequences of the colonial ‘politicization’ of invented ethnicities” (Chabal & Daloz, 1999).

Racial identity cards were issued based on physical characteristics (Gourevitch, 1998; Chrétien, 2003; Chua, 2003), which helped to cement any differences between Tutsi and Hutu, creating ethnic divides and eventually a brewing hatred that could only end in one way, destruction. Gourevitch, (1998) calls this a joint venture between the Belgian government and the Catholic Church to radically re-engineer Rwandan Society along so-called ethnic lines. They went so far as to send in scientists to take cranial, lip and nose measurements as a basis for issuing “ethnic identity cards”. The Tutsi were provided with a superior education and favored positions in government, while the Hutu served as a labor pool (Gourevitch, 1998; Chrétien, 2003).

“In pre-genocide Rwanda, development assistance reinforced ethnic tensions. Individual projects and programs have also caused trouble by reinforcing or exacerbating existing inequalities at local level” (Commission for Africa, 2005).

In the mid-1900s, average family revenues for both Rwandan Hutu and Tutsi were almost the same. Ethic obsession took hold in a small stratum of elite *evolués* educated by the European/Catholic Church complex, resulting in a majority-educated Tutsi elite (a minority of Rwanda's population) favored by French-speaking priests and a minority-educated Hutu counter-elite (making up the majority of Rwanda's population) favored by Flemish-speaking priests; maybe several thousand people (Madsen, 1999; Chrétien, 2003), this transition beginning in the late 1930s. Some called these elite the fourth ethnic group; Hutu, Tutsi, Batwa Pygmies and the educated elite minority. In 1957, with support from the White Fathers, a Catholic order, nine Hutu intellectuals from the seminary issued the "Manifesto of the Bahutu", raising the issue of the indigenous racial problem and the monopoly over access to the best education and leadership roles by Tutsi and denounced them as beneficiaries of "Hamitic domination". By 1958, Tutsi notables published documents attributing the founding of Rwanda to the Tutsi and denying any relationship to the Hutu. With independence around the corner, the Tutsi created the Rwandan National Union/*Union Nationale Rwandaise* (UNAR) and the Hutu Rwandan Democratic Rally (Assembly)/*Rassemblement Démocratique Rwandaise* (RADER). By 1959, ethnic-based slaughter occurred on both sides in the north and center of the country (Chrétien, 2003). Some 300 people died in the violence, known as the Muyaga Massacres, as these two ethnically divided parties vied for power. With the "Winds of Change" fueling the fire, the Belgians wanted out (Madsen, 1999).

13.8.6.2 Independence, control by an impoverished majority

Belgian paratroopers from the Congo moved in and Belgium reversed traditional Tutsi/Hutu relationships, which it helped formalize, "De-UNARizing" the country by replacing half the Tutsi chiefs and 300 of 500 sub-chiefs with Hutu, followed by communal elections giving the Hutu the majority. This was called a

“revolution under trusteeship” or an assisted one, with the ruling party Party of the Movement of Emancipation of the Bahutu /*Parti du Mouvement et de l’Emmancipation* Hutu (PARMEHUTU) being racist to the point that other Hutu parties denounced it in vain. PARMEHUTU claimed to restore Rwanda to its owners and invited the Tutsi to return to Abyssinia. The 1959-61 social revolution would shape Rwanda’s politics for the next three decades (Chrétien, 2003).

The 1960 elections, resulting in the Hutu winning 90% of the political posts, gave an impoverished majority political control over an economically powerful minority (Chabal & Daloz, 1999), which Chua (2003) has shown is a recipe for disaster (see Chapter 11, Section 11.6.3, Neo-Patrimonial Clientelism, The Big Man and “Cosmetic Democracy”) that was exasperated by scarce resources – land (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests, Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization). At a stroke of the pen, the Tutsi monarch was deposed (Madsen, 1999). Dallaire (2003) places independence as 1962, run by a Hutu dominated government and the charismatic leader, Gregoire Kayibanda. In essence, Belgium reversed traditional relationships between these two groups along democratic Western principles where the majority rule. This failed, as rule was along ethnic as opposed to ideological lines, which tends to define party politics in Sub-Saharan Africa, where the majority of populations are uneducated and define their allegiances to extended family, ethnic group, village chief and king/marabou, with the spirit of nationalism and citizenry being far down the line (Chabal & Daloz, 1999).

The way forward of fitting Western ideals of democracy within these cultural differences must be found by the 21st century generation of educated Africans. As discussed, President Museveni of Uganda was the first to break the “Cookie

Cutter Mold” imposed on Africa of “One Man One Vote Multi-Party Elections”, which to date have proven less than successful in creating representative governments (see Chapter 11, Section 11.6.6.2, Uganda, democracy, civil war and attempts to find an African solution).

Tutsi were forced to flee by the politically dominant Hutu majority, which by the 1980s resulted in 700,000 refugees in Uganda, Zaire and Tanzania. By 1964, Tutsi manhunt massacres of up to 10,000 people were beginning. Leading Tutsi party politicians were executed and by 1966 the Party of the Movement of Emancipation of the Bahutu /*Parti du Mouvement et de l'Emmancipation Hutu* (PARMEHUTU) became the only party, with blessing from the Catholic hierarchy. Hutu suspected of being closely tied to Tutsi were considered as hybrids or those who had switched ethnic groups. Regional in-fighting within the Hutu political structure resulted in a 1973 coup *d'etat* moving the Hutu power from the center to the northern part of the country, putting in power General Habyarimana and eventually a new party of power, the National Revolutionary Movement for Development/*Mouvement Révolutionnaire National pour le Développement* (MRND) (Chrétien, 2003). Initially, this occurred at the height of the Cold War, with the West backing the Hutu, while the Tutsi refugees were backed by the communists (Gasana, 2002 In: Matthew, Halle & Switzer, 2002). Eventually, with the end of the Cold War, the French would back the Hutu and the Americans the Tutsi, only this time not for ideological reasons, but for wealth and greed – as usual at the expense of Africa and its people. Habyarimana’s Second Republic represented northern elite, but was rapidly undermined by numerous dualities: 1) Rural poverty, 2) The north/south divide, 3) The Hutu/Tutsi Divide and 4) Rich versus Poor. As an insurance policy, Habyarimana allied himself with Jacques Foccart, “Monsieur Afrique”, who pretty much determined France’s African policy from the 1960s through to the mid-1990s (Madsen, 1999). Habyarimana used gorilla conservation politically to obtain

Western financial and military aid, which, along with his being given conservation awards, led many Rwandans to believe that Westerners cared more about gorillas than the wellbeing of those being massacred nearby (Vande weghe, 2004) (see Chapter 3, Section 3.6.1, Separation of Maasai from Ngorongoro Crater and Chapter 11, Section 11.11.6.3, Failure to integrate Baka into managed bushmeat harvests).

Colonial-era-like social engineering began in which the Tutsi minority could occupy only 9% of the school and job positions, extending ethnic consciousness to new generations thereby creating an ethno-racial democracy. The Hamitic myth under which it was born, came out of colonialism (Chrétien, 2003), but was supported by foreign aid through Western donors. Habyarimana's corrupt totalitarian rule would last two decades, while the majority lived in poverty (Chua, 2003). Habyarimana was a master, using "development" to milk the European and American donors. By law, every citizen was a member of the party (Gourevitch, 1998).

13.8.6.3 Overpopulation and SAP impacting agriculture

Since 95% of Rwanda was under cultivation (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests, Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization) and there was little room for expansion, Habyarimana declared Rwanda full, excluding the idea of Tutsi refugees being repatriated to their homeland (Gourevitch, 1998). By 1990, there was an estimated 174 persons/km² (450 inhabitants/mi²) (Rosenblum & Williamson, 1990). Gasana (2002, *In: Matthew, et al.*, 2002) estimated 290 inhabitants/km² territory and 843 inhabitants/km² of arable land in 1994. Habyarimana also alienated southern-based Hutu, favoring Hutu from his home in the northwestern section of the country (Gourevitch, 1998;

Gasana, 2002 *In: Matthew, et. al., 2002*). In a classical pattern of neo-paternalism, the omnipotent President and his cronies grew rich at the expense of both downtrodden Hutu and Tutsi. Every hill had its chief and, in descending order under the chief, deputies and sub-bosses in a classical patron-client relationship that kept Habyarimana in power, who became the chief of chiefs or *Mwami*. These northwesterners controlled the government parastatals, as well as the military. Rwanda appeared Edenic to foreign donors, the rest of the continent being covered by client dictators of the Cold War ruling by pillage and murder (Gourevitch, 1998).

“If you were a bureaucrat with a foreign-aid budget to unload, and your professional success was to be measured by your ability not to lie or gloss too much when you filed happy statistical reports at the end of each fiscal year, Rwanda was the ticket...The hills were thick with young whites working albeit unwittingly, for the glory of Habyarimana” (Gourevitch, 1998).

By 1986, Rwanda’s chief exports, coffee and tea, crashed on the world market (see Chapter 12, Section 12.2.5, ILO Demands an End to Subsidies and Trade Barriers), with the only easy profit left being scammed foreign-aid projects, with competition for the spoils among Habyarimana’s northwesterners being particularly intense. Sogge (2002) blames the crash in coffee prices (drop of -64% price between 1980 and 2000), that heightened or exacerbated ethnic tension, on USAID and the World Bank, who vigorously promoted coffee farming among poor smallholders, not only in Rwanda, but many other countries, until there was a glut on the world market. Structural adjustment austerity programs (SAP) added to the collapse of world prices for coffee and tea (Diamond, 2005). This impoverished tens of thousands of Rwandan farmers. Meanwhile, the International Finance Institutions (IFIs) praised both Rwanda and Burundi as good performers in free-market fundamentalism (SAP) right up until the genocide (Sogge, 2002). Madsen (1999) believes that the structural

adjustment program of the World Bank/IMF resulted in a return to famine, something not seen for 20 years, accentuating the hostility between Hutus and Tutsis that led to later acts of genocide.

By 1988, Western aid underwrote about 60% of Rwanda's annual budget (see Chapter 11, Section 11.6.7, Foreign Aid and Puppet Governments – “Donor Democracy”). The economic collapse of the late 1980s left tens of thousands of young men without any hope for work, ripe for recruitment into the Hutu *Interahamwe*, “those who attack together” (Gourevitch, 1998). These masses of disenfranchised, poor, under-educated and frustrated youth are a key component for much of the turbulence across Sub-Saharan Africa.

13.8.6.4 Franco-American competition begins, 1990

On October 1, 1990, several thousand Anglophone Tutsi soldiers from the Ugandan National Resistance Army (NRA), who formed the armed wing of the Tutsi dominated (with some Hutu) Rwandan Patriotic Front (RPF), with support from President Museveni of Uganda attacked northeast Rwanda. These Tutsi, comprising 20% of Museveni’s army, had helped Yoweri Museveni, a Hima, liberate Uganda from Milton Obote in 1986 (Gourevitch, 1998; Chrétien, 2003). Museveni was considered the linchpin in an Anglo-Saxon plot to seize control of Central Africa and its natural resources (Madsen, 1999). The RPF was against Tutsi backed Rwandan National Union/*Union Nationale Rwandaise* (UNAR)’s monarchist tradition and was supported by several key Hutu leaders who were disgusted by the corruption and nepotism of the Habyarimana regime. This initial incursion was put down by the Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR) with backing by French, Belgian and Zairian contingents (Gourevitch, 1998; Chrétien, 2003) under *Operation Noiroit*, as the result of a 1975 defense pact signed between Habyarimana and the then-President Valery Giscard d’Estaing (Madsen, 1999).

This may have been the beginning of a period of defensive action in which France began aggressively maintaining its sphere of influence over its former French colonies and other Francophone countries from Anglophone influence, especially the Americans, who have provided strong backing to Museveni since he took power in 1986 and eventually Paul Kagame in Rwanda (Madsen, 1999). Paul Kagame of the Rwandan Patriotic Front (RPF) continued the guerilla war in the north with support from Uganda (Gourevitch, 1998; Chrétien, 2003). The Americans provided military training to the RPF (Madsen, 1999; O'Brien, 2000; Pech, 2000 both *In:* Musah & Fayemi, 2000) and Uganda (O'Brien, 2000 *In:* Musah & Fayemi, 2000), while France provided military training to Rwanda's Hutu army, a proxy war fought by Africans for control of natural resources in Central Africa by the superpowers (Madsen, 1999), these resources being mostly next door in the Democratic Republic of Congo. France funneled huge shipments of armaments to Rwanda right through the killings in 1994 (Gourevitch, 1998).

In desperation, by April 1992, Habyarimana was obliged to move towards a multi-party power sharing system with four opposition parties in creating a coalition government that would move towards a "democratic" transition. It is believed that this multi-party system was given birth in Habyarimana's attempt to retain control under tensions caused by environmental scarcities, war, ethnicity and regional factions. However, this resulted in a loss of state control and the rapid empowerment of radical factions, creating tri-polar politics of Habyarimana's party National Revolutionary Movement for Development/*Mouvement Révolutionnaire National pour le Développement* (MRND), opposition parties and the RPF, with undertones of landless rural youth whose membership was courted by various political parties (Gasana, 2002 *In:* Matthew, *et. al.*, 2002).

There was a total of four major incursions by the Rwandan Patriotic Front (RPF), each one pushing Internally Displaced Persons (IDPs), mainly Hutu further south, crowding them into already resource scarce areas, heightening the tension between rural people, while creating the beginning of ethnic hatred as Hutu were pushed off their land by a Rwandan Patriotic Front (RPF) comprised primarily of Tutsi (Gasana, 2002 *In: Matthew, et. al., 2002*):

- October-December, 1990, 30,000 inhabitants of Muvumba and Ngarama fled their homes;
- By end of 1991, it rose to 350,000 IDPs;
- By July 1992, 500,000 IDPs; and
- By February 1993 >1 million IDPs as RPF violates cease-fire and resumes war, followed by another 350,000 Hutu refugees coming out of Burundi after the assassination of President Ndadaye.

The war caused a major food crisis, both in local production and transport of food aid – an ecological and logistical disaster, resulting in the average available energy of 1,100 calories/person/day (Gasana, 2002 *In: Matthew, et. al., 2002*), about half the minimal daily requirement to subsist for an adult. In essence, by 1994 the war was causing 800,000 people to starve to death, while political elites struggled for power and control of state resources.

Habyarimana let it be known that political disorder would lead to interethnic violence. On the ground, there were no spontaneous reprisals against the Tutsi except for that which was politically orchestrated. As new opposition parties emerged and propaganda in the form of the “Hutu Ten Commandments” against the Tutsi cockroaches (*inyenzi*) and their Hutu accomplishments (*ibyitso*), bloodbaths began by 1992 linked to the Hutu *Interahamwe*, a militia of the National Revolutionary Movement for Development/*Mouvement Révolutionnaire National*

pour le Développement (MRND). The *Interahamwe* was largely made of landless, uneducated youth from IDP camps and urban poor, who had no real ideological commitment, but to serve those who paid them and fed them (Gasana, 2002 *In: Matthew, et. al.*, 2002) – in essence, young child soldiers – mercenaries for hire. The “Hutu Ten Commandments” included (Guest, 2004): 1) Hutu men should never marry or befriend Tutsi women, 2) Every Tutsi was a cheat and any Hutu doing business with a Tutsi was a traitor, 3) All strategic positions, including political, administrative, economic, military and security should be occupied by a Hutu and 4) Hutus must stop having mercy on the Tutsi. In 1993, the Tutsi RPF undertook reprisals, forcing one million people to flee the north towards Kigali.

The August 1993 Arusha peace accord with the RPF, provided the RPF with five key government portfolios out of 21, with the military split 60% Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR) (mostly Hutu) and 40% RPF forces (mostly Tutsi), while command at all levels would be equally shared. This accord did not last for long, being broken before it could really be implemented (Gasana, 2002 *In: Matthew, et. al.*, 2002). By November 1993, the UN “Blue Hats” had arrived as peace keeping forces. However, a Tutsi-dominated army takeover of Burundi in October 1993, cost the lives of elected President Ndadaye and other Hutu officials and eventually, the lives of 100,000 people. The RPF looked too much like the Tutsi dominated army of Burundi (Chrétien, 2003).

13.8.6.5 Next door Burundi

On the contrary, in neighboring Burundi, initially at the time of independence, politics revolved around ideological differences of two princely Tutsi factions, one supporting Burundi remaining friendly to Belgium, the other supporting independence. “Racism” was not an issue. In fact, the party of independence, the

Party of National Unity and Progress/*Unité Pour le Progrès National* (UPRONA), was popular among Hutu, Tutsi, Muslim and Christian and had a majority membership made of Hutu. The United Nations supervised legislative elections in 1961 and handed control to UPRONA. Independence was declared on July 1, 1962, with the political class of educated elites splitting into two factions based on in which school they were educated. Elections in 1964 continued to give UPRONA a majority. However, with 67% (2/3rds) of parliament being Hutu, with the appointment of a Tutsi prime minister, the Hutu leader in collaboration with the gendarmerie, organized a coup *d'etat* in October 1965 and Tutsi massacres began, with reprisals on the Hutu political class from the Tutsi dominated military. From then on, a block formed among the Tutsi who were determined to control the government and army with law-and-order anti-Hutu policies. The monarchy was abolished, followed by a new politic of revenge. Hutu civilian and military leaders were assassinated in 1969, followed by liberal Tutsi "royalists" in 1971. In April 1972, a Hutu rebellion "scourge" organized by exiled leaders in East Africa, resulted in several thousand Tutsi in the south being killed, followed by a genocide of Hutu elites by Tutsi in May and June, leaving 150,000 dead and 300,000 as refugees in Rwanda and Tanzania (Chrétien, 2003). The break between Hutu and Tutsi became as acute as it was in Rwanda, founded on omnipresent fear,

"What is it to be Hutu or Tutsi? It is being neither Bantu or Hamite nor serf or master! It is to remember who killed one of your close relations 15 years ago or to wonder who will kill your child in 10 years, each time with a different answer" (Chrétien, 2003).

In Rwanda and Burundi in the late 1980s, two clichés were inescapable, "democracy of the Hutu majority" in Kigali and "national unity" with strong Tutsi law-and-order in Bujumbura (Chrétien, 2003). Chua (2003) believes it was "political liberalization" along with Belgium racism and favoritism, as well as

decades of corrupt dictatorship, that unleashed long-suppressed ethnic tensions and thus, laid the groundwork for genocide of what she calls a “deeply resented, disproportionately wealthy ‘outsider’ minority”, the Tutsi.

13.8.6.6 Let the genocide begin, America stops potential intervention through the United Nations

The straw that finally broke the camel’s back in the lead up to genocide was on April 6, 1994, with the shooting down of a plane as it landed at Kigali, Rwanda, returning from Dar es Salaam, resulting in the deaths of both Presidents Juvénal Habyarimana of Rwanda and Cyprien Ntaryamira of Burundi (Madsen, 1999; Gasana, 2002 *In: Matthew, et. al.*, 2002; Chrétien, 2003). This event took place at a moment of extreme ethnic tension in both Rwanda and Burundi in which three Hutu Presidents (Habyarimana, Ntaryamira and Ndadaye) had been assassinated within six months. Hutu elites in the presidential guard and militias used this incident in order to maintain control of the Rwandan state by rallying the poor and resource starved masses against the Tutsi and the Tutsi-dominated RPF. By July 19, 1994, the RPF had taken power, but not before a million people were slaughtered (Gasana, 2002 *In: Matthew, et. al.*, 2002). While the RPF army was disciplined, it still undertook reprisal killings of from 25,000 to 60,000 people (Diamond, 2005).

Some believe this plane crash was orchestrated by extremist Hutu from the north, who then militarily seized power (Chrétien, 2003), while others believe that this was undertaken by Kagame and his U.S. backed RPF forces, with American disinformation being used to lay the blame on militant Hutus (Madsen, 1999). Hammond (1996) states that Belgium troops with the United Nations Assistance Mission in Rwanda (UNAMIR) identified the missiles coming from the Hutu Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR) military base at

Konombe. Madsen (1999) implies that America may have not only been aware, but was possibly behind this action. Meanwhile, in March 2004, the French newspaper *LeMonde* published excerpts from a report by an anti-terrorist judge that is the outcome of a six year investigation, accusing President Kagame as being responsible for the plane crash (Bryant, 2004).

The same night of the plane crash the genocide in Rwanda began with the military supporting the *Interahamwe*. The first to die were on a pre-prepared list of enemies: politicians, journalists, lawyers and businessmen, followed by roadblocks killing anyone without a Hutu identity card, Hutu's with ID cards, but who looked "Tutsi" in appearance, Hutu's who refused to take place in the slaughter and anyone looking educated and prosperous – thus assumed to be a Tutsi. This rapidly spread to the countryside, where neighbors who had lived in peace and harmony were suddenly demonic; "Bush clearing" referred to hacking men to death and "pulling roots" referred to killing women and children (Guest, 2004). This genocide was not an anarchic effect of "popular anger" provoked by the death of the father of the nation or an interethnic quarrel, but a deliberate choice by a moderate elite (Chrétien, 2003; Guest, 2004) who played on the fears and the frustrations of a poor, uneducated, over-populated rural populace.

"Well dressed assassins" (e.g., Hutu Bourgeoisie) let the peasants dirty their hands, but they were behind the lines coordinating events. Thousands of youth without a future were transformed into killers caught up in war hysteria. The misuse of lost disenfranchised youth will be discussed again in the case studies on the Niger Delta (see Section 13.10.1.3, Oil and Repression in the Niger Delta – Nigeria) and Sierra Leone (see Section 13.10.2.1, Sierra Leone, war and diamonds) and has already been raised earlier in concerns over the danger of such youth being recruited into global terrorism. Chrétien (2003) also believes the spiral of ethnization was accelerated by the Cold War, with Burundi as a base for

the Chinese to aid the Kivu based Lumumbist of Zaire (the Democratic Republic of Congo) and Rwanda a base for the U.S. Central Intelligence Agency (CIA), each instrumentalizing ethnicity (e.g., CIA working with Tutsi refugee nationalists) (Chrétien, 2003). This will be discussed in some detail below, showing how the Western industrial-military complex is helping to continue fueling anarchy in the Great Lakes region, aligning itself with various rebel and national factions, while compartmentalizing the region as a means of accessing cheap natural resources (Madsen, 1999).

In Rwanda, 800,000 people were killed in 100 days, mostly Tutsi, but also liberal Hutu, amounting to 75% (3/4) of the resident Tutsi population in Rwanda (Chrétien, 2003; Diamond, 2005) and 10% of the total population (Guest, 2004). This amounted to 333.333 people killed per hour or 5.5 people per minute losing their lives (Gourevitch, 1998). The Twa, a Pygmy group making up only 1% of the population and at the bottom of the socio-economic scale, were also massacred in the 1994 killings (Diamond, 2005).

13.8.6.7 Ultimate and proximate causes of Rwanda genocide

Diamond (2005) concludes that reprisals were not entirely ethnic, but also over scarce resources, especially land (see Chapter 5, Section 5.9.4.6, Deforestation in afromontane forests, Rwanda, Over-Population and Land Degradation Linked to Deforestation for Agriculture and Political Destabilization). The ultimate causes of the Rwandan genocide were population pressure, human environmental impacts and drought forming the powder inside the keg; with the proximate causes - the match that lit the keg being ethnic hatred whipped up by politicians and the downing of the airplane. In addition to population pressures, other factors contributing to this genocide include (Diamond, 2005):

- Tutsi domination of the Hutu;
- Tutsi large-scale killings of Hutu in Burundi and small-scale ones in Rwanda;
- Tutsi invasions of Rwanda;
- Rwanda's economic crisis;
- Drought;
- World Factors, including falling coffee prices and World Bank austerity measures (SAP policies);
- Hundreds of thousands of desperate young Rwandan men displaced as refugees in resettlement camps, ripe for recruitment into militias; and
- Competition among rival political groups willing to take power at all costs

Diamond (2005) fails to mention the American/French geo-political issues that came into play.

An example is given in the northwestern Kanama commune where 99% or more of the population is Hutu and land, not ethnicity, was the cause of killings. With population densities in 1993 of 788 inhabitants/km², the median farm size in 1993 was 0.29 ha (0.72 acres) on average, broken into ten small partials of 0.03 ha each. Young people were unable to acquire land, making it difficult to marry. A very big farm was about 1 ha and a very small farm 0.24 ha. The percentage of very big farms and very small farms both increased between 1988 and 1993 from 5% to 8% for very big farms and from 36% to 45% for very small farms; relatively speaking, a divide developing between the rich "haves" and the poor "have-nots". With more people living at home, the number of people per farm household increased from 4.9 to 5.3 between 1988 and 1993, resulting in the average household meeting only 77% of its caloric needs from the farm, relying on off-farm income (e.g., brick making, carpentry, sawing wood, trade). As all over Rwanda, these landless youth, averaging between 21 and 25 years old,

without off-farm income, were resorting to violence and theft. Unfortunately, the larger land owners also earned the largest off-farm incomes, increasing disparities. Between 1982 and 1990, the percentage of the population in the Kanama commune consuming less than 1,600 calories/day, considered below famine level, increased from 9% to 40%. Land disputes began to undermine the cohesion of traditional society; richer land owners expected to help poor relatives, even though the richer landowners were still poor. Disputes increased between fathers and sons over inheritance of land, as traditionally the oldest son was expected to manage the land for the whole family, parceling out pieces to his younger brothers. Now fathers were dividing the land among all sons to avoid conflicts after their passing. The 1994 genocide created a unique opportunity to reshuffle land properties all over Rwanda, in this case with Hutu killing Hutu (Diamond, 2005). Ultimately,

“people whose children had to walk barefoot to school killed the people who could buy shoes for theirs” (Diamond, 2005).

13.8.6.8 United Nation fails to take action

The West, including the United Nations, buried its face in its hands, only reacting after the fact with the Rwanda Tribunals in Arusha, which do not solve the problem and cost the world’s taxpayers millions of dollars. The current Head of the United Nations, Kofi Annan, then Chief of UN peacekeeping, refused to allow General Roméo Dallaire and his 3,000 “Blue Hats” from the United Nations Assistance Mission in Rwanda (UNAMIR) to take action, seeing this as “beyond the mandate entrusted to UNAMIR” (Gourevitch, 1998). This statement about Annan is reinforced by both Madsen (1999) and Dallaire (2003). This was even though the General Assembly of the UN declared genocide a crime under international law in the 1940s. The William (Bill) Jefferson Clinton Administration’s UN ambassador, and eventual Secretary of State, Madeleine

Albright, opposed UN intervention (Gourevitch, 1998; Madsen, 1999; Dallaire, 2003) even though Boutros Boutros-Ghali, UN Secretary General, pleaded to allow this intervention and condemned America's inaction. This eventually resulted in his being dumped and replaced by a more "docile" Kofi Annan (Madsen, 1999). Similarly, the Commission for Africa (2005) concludes that

"just 5,000 troops with robust peace enforcement capabilities could have saved half a million lives in Rwanda".

Dallaire (2003), though admitting Annan prevented him from intervening in the genocide, is not so harsh a critic of Annan, nor does he garnish too much praise on Boutros-Ghali. However, Dallaire (2003) does admonish the UN as an organization and the superpowers that control this body for sending too little too late:

- On April 22, 1994, about 16 days after the genocide started, UN Security Council Resolution 912 voted for a skeleton UNAMIR force, actually forcing Dallaire to withdraw about 1,000 troops to Nairobi with the idea of maybe getting them back if a cease-fire was agreed on in Arusha.
- On May 17, UN Security Council Resolution 918 authorized 5,500 troops, but was vague on the genocide and the role that the UNAMIR force should play in stopping it, the U.S. gutting the resolution.
- By June 19, 1994, when he should have had 4,500 troops on the ground there were only 503 men.
- Not until July 1, 1994, did the UN Security Council pass Resolution 935 that requested the secretary-general to establish a committee of experts to investigate possible acts of genocide in Rwanda.

"Ultimately, led by the United States, France and the United Kingdom, this world body (United Nations) aided and abetted genocide in Rwanda. No amount of cash and aid will ever wash its hands clean of Rwandan blood" (Dallaire, 2003).

Darfur, Sudan in 2004/2005 seems to be a repeat of this nonsense, the UN failing to take in the seriousness of reports coming in from the field and only after the fact, likely to acknowledge genocide; another bureaucratic snafu (see Chapter 5, Section 5.11.4, Darfur, Sudan, overpopulation, desertification, ethnicity, conflict and politics & Chapter 13, Section 13.10.1.6, Oil-scorched earth Sudan).

America was reluctant to get involved, having already been embarrassed in Somalia by a combined force of Iranian Pasdaran and HizbAllah fighters, Iraqi al-Saiqah Commandos, Iranian trained Somalis and Arab Afghans (Muslims trained in Afghanistan as *mujahideen* - Islamic holy warriors) who shot down two American Blackhawk helicopters, killed 18 Americans and dragged their bodies through the streets of Mogadishu, wounded 78 and captured a chopper pilot whom they displayed on international television (Madsen, 1999; Bodansky, 2001; Dallaire, 2003; DeCapua, 2004). In addition, President William (Bill) Jefferson Clinton felt the United States was already stretched thin by committing troops in South Korea and Europe, as well as the possibility of a greater commitment in Bosnia, along with reviving a UN agreement in Haiti (DeCapua, 2004).

Recent U.S. government documents released to the National Security Archive of George Washington University, under the Freedom of Information Act, show that the William (Bill) Jefferson Clinton administration was aware in late April 1994 that genocide was taking place, about two weeks after the start of the killings. However, it did not use the word publicly until much later, even though the intelligence community was using "genocide" as a description of the problem by April 26, 1994. The official position of the White House in early June was that the word genocide should not be used, that it was still impossible to determine if it

was genocide. The U.S. was not being asked to send troops, but rather was asked to give its political support in sending more UN troops (DeCapua, 2004).

A Presidential Decree came out stating that America would contribute to peace keeping operations only if it was in their vital interests. However, it was not in the interest of the United States to seek a negotiated settlement in this conflict with support from UN peace keeping forces (Madsen, 1999). Rwanda was an important piece of the puzzle needed by America in its hegemony over Sub-Saharan Africa, especially Francophone Africa.

While white-on-black violence would make the international press for days on end, even when the victim was one person (e.g., Rodney King), it seemed that black-on-black genocide was largely ignored until after the fact. Was this the shame of the “White Man’s Burden” for another failure in social-engineering, stemming from colonialism or outright racism where the death of “primitive Africans” failed to touch Western consciences? At the same time, wildlife in Akagera National Park was virtually wiped out. In 2006, attitudes are changing as Westerners demonstrate against genocide in Darfur, Sudan, but by early 2008 there has been little action on the ground.

13.8.6.9 The French connection

The French established the “*Zone Turquoise*” in southern Rwanda, which served as a safe haven for the proponents of “Hutu Power” where the killing continued unabated (Gourevitch, 1998; Madsen, 1999; Dallaire, 2003). The French hoped somehow to keep the pro-French Hutu government and its Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR) in power over the onslaught of the U.S. backed English speaking Tutsi RPF movement (Madsen, 1999). President Kagame has accused the French government of not only training Hutu

troops and forces that carried out the massacres, but in having a direct hand in the killing (Bryant, 2004).

13.8.6.10 Big business for NGOs

About 750,000 former exiles, mostly Tutsi, returned to Rwanda (Diamond, 2005). Between 1.2 (Gasana, 2002 *In: Matthew, et. al.*, 2002) and 1.5 million (Chrétien, 2003) to 2 million (Diamond, 2005) Hutu fled to Zaire (the Democratic Republic of Congo) to escape revenge and to a lesser degree, to Tanzania and Burundi. The Hutu refugee camps in the Democratic Republic of Congo were controlled by armed members of the Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR), who expropriated up to 10% of all foreign aid to support their actions (Chrétien, 2003). Humanitarian aid NGOs with Western aid money, knowingly fed these “Hutu Power” perpetrators of genocide. The business was too good, as 70% of the money went right into the pockets of the aid teams and their outfitters in the form of overhead, supplies, equipment, staff housing, salaries, other benefits and assorted expenses, leaving 25 cents a day/refugee, nearly twice the per capita income of the average Rwandan. The humanitarian NGOs were treated rather like the service staff at a “seedy mafia-occupied hotel”, providing food, medicine, house wares and an aura of respectability, becoming accessories to the Hutu Power syndicate. A political crisis was treated as a humanitarian crisis, perpetuating the political crisis and the suffering, misery and deaths of many people. Diverted humanitarian aid was used to purchase arms (Gourevitch, 1998) (see Chapter 11, Section 11.7.2, Foreign Assistance Conditionalities Good Business for Donor County Not Recipient/Host Country).

13.8.6.11 French and U.S. arm proxies for the takeover of the Democratic Republic of Congo

France, with Mobutu Sese Seko's accord, was known to have been directly and indirectly involved in supplying Hutu "refugees" with arms to continue their persecution of Tutsi, both in Rwanda and in the North/South Kivu provinces of the Democratic Republic of Congo (Madsen, 1999). It is estimated that ex-Hutu Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR), (reassembled in the Democratic Republic of Congo), made up about 7% of the 1.5 million refugees fleeing Rwanda. They continued to re-arm and train with the Zairian Armed Forces/*Forces Armées Zaïroises* (FAZ), while using refugee camps as launching pads for FAR cross-border raids into Rwanda and Burundi (Pech, 2000 *In: Musah & Fayemi, 2000*).

This forced the American-backed RPF (Tutsi under Kagame), with backing from Uganda, to support Kabila under the "Alliance of Democratic Forces for the Liberation of Congo /*Alliance des Forces democratique pour la liberation du Congo* (AFDL/ADFL)" to over-throw the French-backed Mobutu Sese Seko government. Mabutu was what Museveni called an "agent" of his Western puppeteers, while the Hutu Power "genocidaires" owed their sustenance to the mindless dispensation of Western charity, with the false promises of international protection followed by swift abandonment of hundreds of thousands of civilians in the face of extreme violence (Gourevitch, 1998) (see Section 13.10.3.1, U.S. government involvement in the DRC and Section 13.10.3.2, U.S. military aid).

13.8.6.12 The aftermath in Rwanda

On July 19, 1994, a Government of National Unity was created that was to conform to the Arusha accords, with Pasteur Bizimungu, a Hutu member of the

RPF as President, a Hutu prime minister and Paul Kagame, Vice-President and Minister Of Defense and thus head of the Rwandan Patriotic Army that grew out of the RPF (Chrétien, 2003; Dallaire, 2003). By 1996, Rwanda began its pursuit of military adventurism, as would Uganda, Zimbabwe, Namibia and Angola among others, linked to resource booties as described below (Madsen, 1999) (see Section, 13.10.3, Congo-Kinshasa DRC, Sub-Saharan Africa's world resource war). It should be noted that in 1998, U.S. military trained Paul Kagame was elected Chairman of the Rwandan Patriotic Front (RPF), a partner in the Government of National Unity. On April 17th, 2000, Paul Kagame was unanimously elected President of the Republic of Rwanda by the Transitional National Assembly. He took the Oath of Office on April 22nd, 2000 (Kagame, 2005) and still holds the position in 2008.

The RPF control all important institutions in Rwanda; the army, police, bureaucracy, judiciary, banks, universities and state-owned companies. Elections can be annulled if the winner campaigns on a divisionist platform. Most Tutsi's believe that the only way to prevent another slaughter is for the RPF to remain in permanent power. Though efficient, while maintaining peace, there are complaints of censorship and, as will discussed below (see Section, 13.10.3 Congo-Kinshasa DRC, Sub-Saharan Africa's world resource war), Kagame and the RPF are ruthless, having been involved in the slaughter of Hutus just across the border in the Democratic Republic of Congo (Guest, 2004), with incursions occurring as late as December 2004.

Ten years after the Rwanda genocide, while registering strong economic growth, the Rwandan government is being accused as authoritarian and prejudiced against the Hutu as 80% of the 200 most important positions in government are Tutsi, even though they make up only 15% of the population. The Tutsi in power were being accused of being elitist, just as the Hutu are accused, not necessarily

representing the true interests of the Tutsi population. Hutu appointed to prominent positions have shadow Tutsi making key decisions (e.g., Permanent Secretary for a Minister, First Council for an Ambassador). The RPF claims that it is all inclusive and although having 80% of the seats in parliament, they make up only 50% of the cabinet. Some also say that there are Tutsi political elite divisions and rivalries within the RPF that could destabilize the country, even resulting in a coup *d'etat* (Eagle, 2004).

Gasana (2002 *In: Matthew, et. al.*, 2002) is concerned that there is still a winner-take-all mentality rather than a win-win relationship between both ethnic groups. There is still a fear by both ethnic groups that the one in power will dominate and oppress the one out of power, with an ethnic-based military backing an ethno-political regime as opposed to security of people and the environment. This threatens the survival of society, partitioning it into rival ethnic groups united by enmity and fear.

13.8.6.13 Post-genocide Burundi

Meanwhile, in Burundi, Madsen (1999) indicates that Pierre Buyoya, as the Tutsi dictator from 1988-1992, presided over the slaughter of thousands of Hutu. By 1992, there was a democratic constitution where amnesty was offered to returning refugees and President Buyoya, a Tutsi, expressed that (Madsen, 1999)

“ ‘Burundi is not exclusively a country of Bahutu where Batutsi are only guests. It is no longer a country of Batutsi where Bahutu are only second-class citizens.’ ”

A Hutu, Melchior Ndadaye, was elected the first civilian head of State in 1993 with a desire to eradicate “ethnic sickness”, forming a government that was 33% (1/3rd) Tutsi. However, a military takeover in 1993 threw much of this into

question, resulting in the assassination of Ndadaye (Chrétien, 2003). Buyoya was linked to this assassination and the slaying of 100,000 Hutus (Madsen, 1999). This was followed by a UN brokered election of Ntaryamira as President (Chrétien, 2003), who died in the plane crash, followed by a coup (once again by Buyoya) on June 25, 1996, against a democratically elected Hutu President, Sylvestre Nitbantunganya (Madsen, 1999).

The Tutsis believed that Nitbantunganya was providing cover for militant Hutus. Within three weeks after Buyoya seized power, 6,000 Hutu civilians were killed. Nitbantunganya's government was also seen as pro-Mobutu Sese Seko and thus, pro-French. Buyoya fit into the plans of the Clinton Administration, linked to the Tutsi allies in Rwanda, Uganda and eastern Zaire that would be used to take Kinshasa, overthrowing Mobutu Sese Seko, while placing Laurent Kabilal in power as an American puppet. By August 1996, Burundian Tutsi troops conducted joint operations with Rwandan RPF forces on Burundi Hutu refugee camps in the South Kivu Province where the Burundian Hutu rebel group, Forces For the Defense of Democracy/*Forces de Defense de la Démocratie* (FDD), had its headquarters (Madsen 1999).

By 1998, there were two vice-presidents in Burundi, a Hutu and Tutsi (Chrétien, 2003). This partnership is considered fragile and illusionary, with Burundi being trapped in two extremist camps, 1) The Tutsi conglomerate that controls the army and 2) The Hutu conglomerate hoping for a Rwandan model (Chrétien, 2003). Domitien Ndayizeye, a Hutu, succeeded Pierre Buyoya, a Tutsi, as head of a three-year transitional government on 30 April 2003, each serving for a period of 18 months. He had served as Vice-President during Mr. Buyoya's 18-month term. The government was set up in November 2001 as part of efforts to end ten years of civil war between the Tutsi minority, which has traditionally ruled the country, and the Hutu majority (BBC Monitoring, 2003). At the end of this three-year

period, elections will be held. The first ever African Union peace keeping force was established in April 2003, consisting of South African, Mozambican and Ethiopian troops in attempts to arrange cease fires between the government and various rebel groups (Africa Online, 2003) such as Forces of National Liberation and Forces For the Defense of Democracy/*Forces de Defense de la Démocratie* (FDD) (Dougherty, 2003). However, by December 2003, the UN Security Council agreed to send in a peace keeping force, as the AU did not have sufficient funds to continue the process (Africa Online, 2003).

Chrétien (2003) goes on to explain how the political-military elite from the hills of Rwanda in 1959 to the forests of Zaire in 1997 and throughout the Great Lakes region today, exploit the masses through a strategy of “ethnic conscious raising” and related tactics of excitement. Some call this “political tribalism”, flowing down from high-political intrigue through external competition, as opposed to politically constructive “moral ethnicity” that creates communities from within through domestic controversy over civic virtue (Chabal and Daloz, 1999) (see Chapter 11, Section 11.3, NEO-IMPERIALISM IN SUB-SAHARAN AFRICA and Section, 11.6.3, Neo-Patrimonial Clientelism, The Big Man and “Cosmetic Democracy”). The misuse of ethnicity through “political tribalism” is not unique to Sub-Saharan Africa, being seen recently in the former Yugoslavia.

Diamond (2005) concludes,

“...overpopulation, environmental impact and climate change cannot persist indefinitely: sooner or later they are likely to resolve themselves, whether in the manner of Rwanda or in some other manner not of our devising, if we don’t succeed in solving them by our own actions...similar motives...may operate again in Rwanda itself, where population today is growing 3%/year, women are giving birth to their first child at age 15, the average family has between 5-8 children and a visitor has the sense of being surrounded by a sea of children”.

Similarly, General Dallaire (2003) states,

“Rwanda was a warning for all of us of what lies in store if we continue to ignore human rights, human security and abject poverty...But many signs point to the fact that the youth of the Third World will no longer tolerate living in circumstances that give them no hope for the future...we can no longer afford to ignore them...the global village is deteriorating at a rapid pace and in the children of the world the result is rage...Human beings who have no rights, no security, no future, no hope and no means to survive are a desperate group who will do desperate things to take what they believe they need and deserve...if we do not immediately address the underlying (even if misguided) causes of those young terrorists’ rage (referring to 911 bombing of the World Trade Center, New York), we will not win the war...The lack of hope in the future is the root cause of rage. If we cannot provide hope for the untold masses of the world, then the future will be nothing but a repeat of Rwanda, Sierra Leone, The Congo and September 11...this new century must become a Century of Humanity...*Peux ce que veux. Allons-y*”.

13.9 GLOBALIZATION, AFRICA AND RESOURCE WARS – CAPITALISM WITHOUT A CONSCIENCE – BOOTY FUTURES

With the end of the Cold War, the only groups with any great interest in Sub-Saharan Africa are resource exploiters. Most of these groups are exploiting non-renewable resources and unfortunately appear to be taking a short-term perspective with regard to Sub-Saharan Africa and its development.

One could also argue, as being undertaken, that Sub-Saharan Africa’s renewable natural resources linked to logging, coastal development and hunting, with little or no monitoring, are currently still being plundered for short-term gains. Beneficiaries are mostly middlemen; governments, logging companies, tourism/safari operators and NGOs – NGOs living off large sums of donor money funneled to them. The beneficiaries receiving the least from the mining of these

resources are rural and coastal Africans, to whom by all rights the resources belong, but who have had them confiscated by colonialism and, since the 1960s, by the newly independent African governments (see Chapters 3 to 11).

Until the “land/resource owners” are given back title to their resources, until they are educated as to the value of these resources and are educated in a way that allows them to integrate Western concepts of resource management with traditional management and value systems, Sub-Saharan Africa’s natural resources will continue to be mined; on one hand by carpetbaggers and opportunists from the West and on the other hand, by poverty itself, which is forcing rural Africans to react in unsustainable ways towards their environment in trying to survive.

The private sector, seen as a key in collaborating with Sub-Saharan Africa to obtain the added value for its resources on the international market, must be one with a “conscience” that is sensitive to how they integrate their entrepreneurial skills both in creating wealth, but at the same time, in eliminating poverty and repression. The private sector has already helped Sub-Saharan Africa (mainly the political elite) generate wealth from using Western technologies and obtaining the added value from these resources on the international market, but for many reasons has not helped eliminate poverty nor the overwhelming hopelessness of the masses on the subcontinent. More of this wealth must reach the people living with these resources. This must occur if Sub-Saharan Africa’s natural systems, which most Westerners want to experience (“Wild Africa”), have a hope in hell of surviving the 21st century and if, as seen from 911, the “Western Way of Life” as we know it today is also to survive. While it may seem like they are two worlds apart, “Wild Africa” and our “Western Way Of Life”, the survival of both are integrally linked beyond the wildest imagination of the average person – and it is this which decision makers in the West must come to understand.

“During the decade of the 1990s, the number of civil wars in Africa almost doubled. One reason may have been the growth in Africa of a futures market for natural resources captured in battle what might be called the ‘booty futures’ market. The sale of booty futures is a tool of the weak against the strong: it has helped provide aspiring rebel groups with the funds they need to launch attacks on governments; it also provided governments on the verge of defeat with the money they need to fund counterattacks. It can hence fund the initiation of civil wars that might otherwise never begin, and lengthen wars that are on the verge of ending. The booty futures market has the greatest implications for the resource-rich states of Sub-Saharan Africa...armed conflicts in the rest of the world dropped by about 33% (one-third) between 1989 and 1999, while the number of armed conflicts in Africa rose. Africa accounted for 30% of the world’s armed conflicts in 1989” (Ross, 2002) (see Chapter 5, Section 5.10, CIVIL WARS - A MAJOR CAUSE OF DECLINING AGRICULTURAL PRODUCTION AND FAMINE IN SUB-SAHARAN AFRICA).

“The profit-oriented nature of contemporary civil war economies makes it difficult to implement a peaceful and sustainable end to the conflict. Indeed, economic agendas may lengthen civil conflicts because not only do they constitute a vested interest in continued conflict, they also tend to create widespread destitution, which itself may feed into economically motivated violence. Instead of an armed conflict between two or more distinct groups for control over the state, the parties are fighting to control economically-rich regions, trade corridors, ports, railways, and roads in order to gain access to the global market” (Black & Grant, 2002).

“The resources diverted from development uses by conflict—over and above any additional assistance provided by the international community—are estimated at \$US 1 billion a year in Central Africa and more than \$US 800 million in West Africa. To this must be added the costs of refugee assistance, estimated at more than \$US 500 million for Central Africa alone” (World Bank, 2000).

“The income from the trade in ‘conflict resources’ has been used to finance wars. ‘Conflict resources’ are resources, such as oil, diamonds, timber or COLTAN, the revenues from which enable warring parties to continue their activities - for example, by buying arms. Gaining access to such riches encourages coups and rebellions, and can become the reason for continuing hostilities.

Sometimes, money is raised not through selling the actual resources, but by using anticipated revenues to access loans or other forms of finance. Where the extraction and selling of natural resources form an important part of the war economy, wars tend to last longer and are more difficult to resolve – as has been the case in, for example, Angola, Liberia, Sierra Leone, Somalia, and the DRC. This is linked to the illicit arms trade, clandestine transport systems, money laundering, and criminal networks” (Commission for Africa, 2005).

13.10 RESOURCE WARS

“The moral measure of the U.S. trade relationship with Africa is whether it helps reduce poverty among Africa’s poorest peoples....Governments, International Finance Institutions (IFIs), and private corporations involved in the exploration, development, production, and sales of natural resources (e.g., oil, diamonds, timber, minerals, and precious gems) all have a moral responsibility to ensure that the otherwise legitimate development of these resources does not contribute directly or indirectly to corruption, conflict, and repression. Transnational Corporations (TNCs) ought to adopt codes of conduct that reinforce their social responsibilities, direct their activities toward the common good, and adopt transparency in operations and financial accountability. In certain cases, it might be necessary for international authorities to penalize abusive companies. These are concrete ways to protect and promote the rights, dignity, and social development of the peoples and nations of Africa” (U.S. Catholic Conference of Bishops, 2001 *In: Gary & Karl, 2003*).

“Resources provide a convenient way to sustain ‘justice-seeking’ rebel movements and are easily lootable assets that can encourage ‘loot-seeking’ rebellion. They can also help governments fund armies or buy popular support. The risk of civil wars has also been associated with political repression and the absence of political rights” (World Bank, 2000).

An Extractive Industries Review (EIR) undertaken by the Operations Evaluation Department, World Bank: IBRD/IDA (OED)⁵³⁷ found that in countries with a high dependency on primary commodity exports, the risk of civil war is 23%, compared to 0.5% risk in a country with no natural resource exports. These extractive resource dependent countries also had lower GDPs and lower performance in poverty alleviation compared to countries with little or no mining or petroleum capabilities (Bossard, Brule, Horta, Lawrence & Welch, 2003). Similarly, the Commission for Africa (2005) concluded that

“countries with the most oil, diamonds and other high-value natural resources are among those which have experienced the most war and armed conflict” (see Section 13.5, FAILURE TO DEVELOP GOOD GOVERNANCE IN MINERAL RICH COUNTRIES).

Africa has been identified as the site of 16 of 32 internal conflicts in 1996 and, in 1998, 14 of Africa’s 53 countries were engaged in wars, having the largest refugee and displaced population in the World, totaling 12 million persons (Zack-Williams, 2002 *In: Zach-Williams, et al., 2002*).

“Violent changes of government were the rule in this region prior to 1989, and the pattern continues today in countries such as Rwanda, the former Zaire (the Democratic Republic of Congo), Liberia, Sierra Leone, Ivory Coast and Sudan. However, there are some signs of an increase in democracy, most notably in the peaceful and democratic transition from minority white rule to majority black rule in South Africa” (CALTECH, 2002) (see Chapter 5, Section 5.10, CIVIL WARS - A MAJOR CAUSE OF DECLINING AGRICULTURAL PRODUCTION AND FAMINE IN SUB-SAHARAN AFRICA).

The neo-colonialism, which expropriated resources and the landscape, while alienating Africans from it

⁵³⁷ The World Bank is composed of the International Bank for Reconstruction and Development (IBRD) plus the International Development Association (IDA).

“...has its echoes throughout Africa – and the developing world generally – in everything from the gas flares of the Niger Delta to the way dollars for diamonds or oil provide impetus to wars in Angola, Sierra Leone or the Democratic Republic of Congo. It is repeated in the expulsion of the hungry herdsmen and spindle-thin cattle from national parks in East Africa (all over Sub-Saharan Africa) so that tourists can see more wildebeest and the lions can prey on them” (Maddox, 2002 *In: Dovers, Edgecombe & Guest, 2002*).

Today this colonialism is carried out through the globalization process by multi-national companies and conservation NGOs (see Chapter 11, Section 11.10, FOREIGN AID AND THE ENVIRONMENT), with support and manipulation by Western governments often in collusion with corrupt puppet governments who impose their value systems on Sub-Saharan Africa and/or plunder its resources.

Hoogvelt (2002 *In: Zack-Williams, et al., 2002*) feels that not enough has been done to challenge the divine right of foreign companies to bloody their hands for the sake of gaining access to the resources necessary to sustain lifestyles in the West. Although consumers in the U.S. and elsewhere are beginning to organize company boycotts to protest labor rights abuses by transnational manufacturing companies in the Third World, there is little consumer awareness in the West that diamonds, gold, rubber, copper, oil, aluminum, timber and in the past, ivory among other resources, are often extracted through wars and killings. Booker and Minter (2003) recommend that oil companies be required, as part of the international “Publish What You Pay” campaign, to provide transparency as to what they are paying the Nigerian government as a means of reducing corruption and holding the government accountable for investing in the people and the development of the country (see Section 13.12.1, “Publish What You Pay” an Attempt at Developing Transparency in Distribution of Wealth from Africa’s Natural Resources). The entrance of America, England and Australia into Iraq,

while done in the name of “weapons of mass destruction” and the over-throw of a despot, is believed by many to be more about control over strategic resources (oil) and geo-political control. This may be the first “global resource war” that awakens the citizens of the West to what is going on, since much of what has happened in Sub-Saharan Africa has been more clandestine and under-reported in the press.

Ultimately, the current means of resource extraction results in instability and increased poverty. Ordinary citizens, who are often the real owners of the resources, are left dispossessed and reliant on donor assistance (Global Witness, 2004) and can form the basis for radical terrorism against governments and their private sector allies.

Thus, Global Witness (2004) believes that:

- Taxpayers in the North are required to compensate for state failure in the South in the form of aid: this is inefficient and undermines the current donor emphasis on improving governance in non-transparent countries;
- The international community faces instability that, in some cases, directly threatens the security of energy supplies (e.g., civil war and terrorism); and
- Current policies of energy security seem to rely on leaving failed and failing states alone whilst the resources keep flowing out.

13.10.1 Africa and its oil

When taken as a group, all

“ ‘rich’ less developed countries dependent on oil exports have seen the living standards of their populations drop – and drop dramatically” (Gary & Karl, 2003).

“ ‘Oil should be for the life and not the death of our people’ ” (Catholic Bishops of Congo Brazzaville *In:* Gary & Karl, 2003).

“Our oil is still, in most cases, the private reserve of the powers that be . . . Central Africa wallows in misery despite the growing discoveries of oil . . . Our involvement, as a church in Central Africa, with the issue of oil does not arise from meddling in issues reserved for State authorities. We are witnesses to the suffering of the people to whom we belong. Our prophetic mission impels us to launch a heartfelt appeal to all those who participate in oil exploitation in our region or who wield any political and economic power. – Statement of the Catholic Bishops of Central Africa – (Association of Episcopal Conferences of the Central African Region), July 2002, issued in Malabo, Equatorial Guinea” (*In:* Gary & Karl, 2003).

“What is likely to happen if African countries...exploit oil in the context of very weak political and economic institutions? What is likely to happen is that oil will exacerbate profound political and economic crises...It will lead to a reduction of the welfare of people in oil exporting countries. It will provoke violence and unrest. It will lead to the violation of rights. It will lead to the destruction of the environment. It will buffer authoritarian rule. That’s what will happen, again, if (oil investment) is inserted in weak political and economic and social institutions without interventions to see that something to the contrary occurs” (Professor Terry Karl, Stanford University *In:* AOPIG, 2002).

“Oil has become a frontline globalization issue, not only because of the corruption and conflict it breeds but due to the negligible development contribution it tends to make in poor countries. It is not labor-intensive and thus creates few jobs and secondary industries. Its sole potential benefit for the poor is the money that

goes straight into government coffers. In the absence of transparency, this money is easily embezzled” (Brottem, 2004).

For instance, in Equatorial Guinea, “government oil revenue is paid into treasury accounts held abroad” with little or no transparency, while Nigeria and Gabon have “squandered huge amounts of export earnings” (Kabemba, 2003).

Oil and American Foreign Policy

U.S. Energy Secretary, Spencer Abraham, told Congress,

“Energy from Africa plays an increasingly important role in our energy security” (Royce, 2002).

“Yet bad governance in West Africa threatens its growing oil producer status. Three years after shedding a military dictatorship, now-democratic Nigeria still labors with deeply rooted corruption. While a decades-long civil war in Angola has mercifully wound down, one watchdog group has charged that a remarkable \$US 1.4 billion dollars of its oil revenue went unaccountable last year (2001)” (Royce, 2002).

“The (U.S.) Secretary of State for Africa, (Walter) Kansteiner, made it explicit: ‘It is undeniable that African oil has become a national strategic interest for the USA.’ The reason for this goes beyond the oil lobby linked to the president and his whole staff (it is hard to find a single one who is not on the payroll of some oil multinational). In Africa, moreover, it seems possible to make one of the new priorities of the White House futurologists come true: new economic and military protectorates. Which is to say: direct military control over a territory – without the boundaries or institutions that are properly those of a state – to be exploited for its primary resources. Situations like this would enhance U.S. strategic independence and be useful for the direct control over the areas involved. While the frontiers and carving up in the oil circle in Caucasus and Afghanistan goes on, in Africa the number of new reserves discovered and tapped has increased. New wells and pipelines are springing up all over. Cameroon is about to become an ever more important supplier of crude oil (the plans for an oil

duct from Chad to Cameroon moves apace), at the cost of a devastating impact on the environment and an ever lower level of democratic tolerance. Equatorial Guinea has been a good supplier for years (above all to the USA), so much so that a blind eye is turned toward the murders, disappearances, and shady dealings of a scandalous system. Gabon, a hunting reserve for the French company Totalfina-Elf, has been for decades the prize to be won in a high-stakes game between giants in the sector. From the Morocco government come rumors – to which U.S. diplomacy pays close heed – of important oil reserves in the Western Sahara; which would mean, among other things, an end to any possibility of self-determination for the Saharawi people” (Jampaglia, 2002).

It should be noted, as discussed above, that after “WSSD/World Summit on Sustainable Development – Earth Summit” of 2002 in Johannesburg, South Africa, two of the first acts that U.S. Secretary of State Collin Powell undertook were visits to the oil-rich countries of Angola and Gabon. On the positive side, he told dos Santos, the President of Angola, a former Marxist now supported by the West, to stop asking for donor handouts and to start using the income generated from oil to develop his country (VOA, 2002). In Gabon, on behalf of the USA, he gave US\$ 50 million for the protection of forests and the turning of 10% of Gabon into parks (ANON, 2002a) (see Section 13.8.2.2, America declares the end of France’s *chasse gardeé*). The oil-rich Gulf of Guinea may be the most important strategic area in Sub-Saharan Africa.

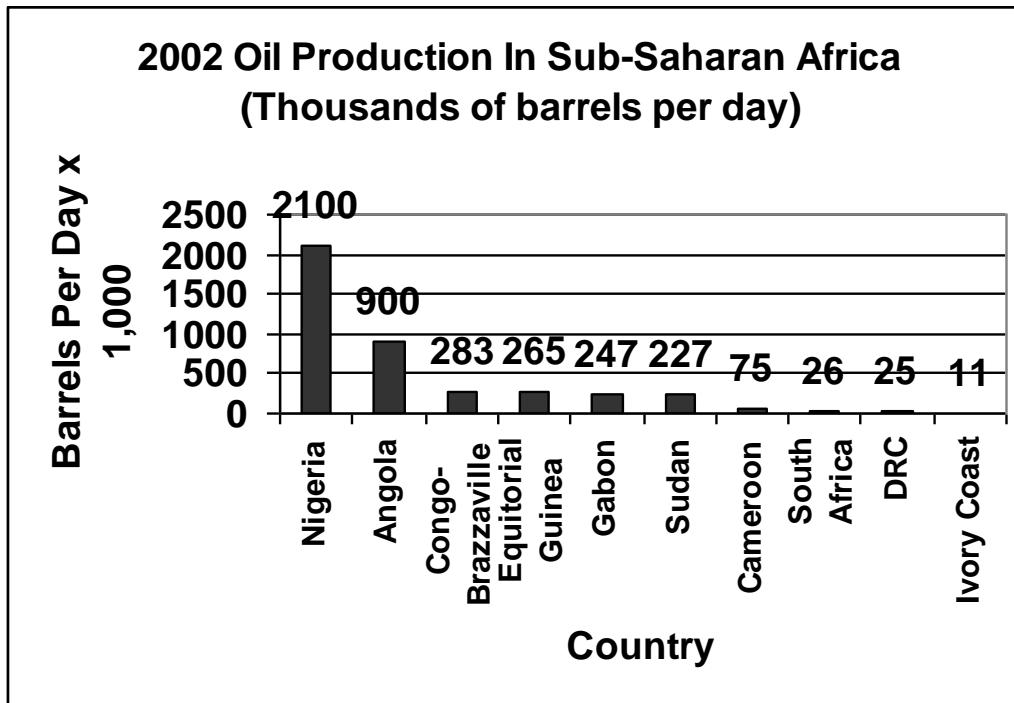
In 1993, the earliest year for which there were full figures, 494,000 barrels/day or 7% of U.S. imports came from the Gulf of Guinea versus 1.6 million barrels/day or 25% of U.S. imports from the Persian Gulf according to the Energy Information System (Harris, 2007). By 2001, approximately 15% of America’s oil came from Sub-Saharan Africa (AOPIG, 2002). In 2001, 1.5 million barrels a day of oil came to American shores from Sub-Saharan Africa, including shipments from Nigeria, Angola, Gabon, Equatorial Guinea and Congo Brazzaville (AOPIG, 2002; Royce, 2002). By 2006, Sub-Saharan Africa could supply eight million

barrels of oil a day compared to 3.8 million/day (Kotch, 2005) to 4 million/day today (Murdock, 2002). Currently, of the 3.8 to 4 million barrels/day from Sub-Saharan Africa, 1.5 million/day (38%) go to the U.S. and Canada, 1.3 million/day (35%) to Asia-Pacific, 0.7 million/day (20%) to Europe, 0.2 million/day (5%) to Latin America and 0.09 million/day (2%) to Africa (Kotch, 2005). In fact, by 2006 Sub-Saharan Africa provided 1.8 million barrels/day or 18% of U.S. oil imports compared to 2.2 million barrels/day or 21% of U.S. imports from the Persian Gulf (Harris, 2007).

The largely offshore oil between the Ivory Coast and Angola yields low-sulfur petroleum necessary for developing gasoline (petrol) (Murdock, 2002). The Gulf of Guinea region, covering West and Central Africa, is generally viewed by the oil industry as the world's premier "hotspot", soon to become the leading deepwater offshore oil production center. New technology for deeper offshore drilling has made West Africa one of the world's top oil prospecting regions (Royce, 2002). Nigeria is the world's 6th largest oil exporter and 5th ranked provider of crude to the U.S. at over 900,000 barrels/day (AOPIG, 2002). Nigeria alone could produce up to three million barrels of oil a day (Royce, 2002). Sub-Saharan Africa has about 7% of world's proven oil reserves, estimated at 24 billion barrels in the Gulf of Guinea alone, while seven billion of the eight billion barrels of crude oil discovered in 2001 came from fields off West and Central Africa's Atlantic Coast (Gary & Karl, 2003). Kotch (2005) estimates Africa to have 8% of the worldwide oil reserves of which 3.7% come from Sub-Saharan Africa, 57% from the Middle East, 15.5% from the USA/Canada, 9% from Latin America, 6% from the former Union of Soviet Socialist Republics (USSR), 3% from the Asia-Pacific and 1.5% from Europe.

In West Africa, Mauritania is expected to yield significant oil finds after initial prospecting success, as is Niger. Senegal and Guinea-Bissau are in the exploration

phase, while Côte d'Ivoire is a small, but growing producer. Sierra Leone recently launched an offshore bidding round and, in East Africa, Sudan is an active oil producer. While oil exploration off Kenya and Tanzania has not been successful to date, drilling in the Semliki Valley in western Uganda reportedly struck oil. Seismic surveys in 1999 revealed a potential for almost one billion barrels. The northern and southern Lake Albert basin is of interest, with this potential field being shared with the Democratic Republic of Congo. Exploration is ongoing offshore of Madagascar and South Africa (Gary & Karl, 2003) (Figure 13.4).



Source: Extracted from Gary and Karl (2004) © Catholic Relief Services. Used with permission; all rights reserved.

Figure 13.4: Oil production in Africa

Some project that with problems in the Middle East (i.e., Persian Gulf oil supply), oil from Sub-Saharan Africa could rise to 25% (or more) of America's imports by 2015 (AOPIG, 2002; Royce, 2002; Voice of America, 2002; Gary & Karl, 2003), amounting to over 2.5 million barrels/day (AOPIG, 2002) (see Section 13.8,

FRANCE/US ANGLOPHONE COMPETITION FOR INFLUENCE AND RESOURCES IN AFRICA – NEW SCRAMBLE FOR AFRICA).

Between 67% and 75% of U.S. Foreign Direct Investment (FDI) in Africa in the next decade will be in the energy sector, projected to exceed US\$ 10 billion/year by 2003 (AOPIG, 2002). It is expected that more than US\$ 50 billion, the largest investment in African history, will be spent on African oil fields in the next seven years (Gary & Karl, 2003). The Catholic Relief Services (Gary & Karl, 2003) and CAFOD (2004) estimates that centered in the Gulf of Guinea from Nigeria to Angola, Sub-Saharan African governments will receive over \$200 billion in oil revenues over the next decade.

Angola currently captures between 40% and 75% of revenues raised from its petroleum and Congo Brazzaville earns between 35% and 40%, the difference going to the private sector. Nigeria, having learned from the Organization of the Petroleum Exporting Countries (OPEC), captures between 50% and 70% of oil revenues from international companies. In contrast, newcomers Equatorial Guinea earns 10% to 20%, while Chad earns only about 10%.

“This means that the older exporters have had a greater opportunity to use oil wealth to alleviate poverty. Yet, despite their enhanced prospects from capturing more oil rents, the oil-led development trajectory of these older exporters is similar to that of exporters in other regions of the world” (Gary & Karl, 2003).

This will potentially enable them to vastly improve lives through investment in health, education and other vital services, even though the history to date demonstrates that petrodollars have not helped developing countries to reduce poverty, but in fact have actually exacerbated it (Gary & Karl, 2003).

Corruption and Natural Resources

Stiglitz (2002) is concerned, especially in the fields of mining, oil and natural resources in the developing world that Foreign Direct Investment (FDI) comes about from corruption and bribery of government officials as a means of obtaining concessions at low prices. This results in a dual economy in which there are pockets of wealth still surrounded by a majority of poverty, but not a developing economy of transformation that helps eliminate poverty and which creates a middleclass. The rich get richer, the poor get poorer and the multi-nationals, by paying off a few elites, take the resources out as cheaply as possible, with little or no environmental controls or worker safety – maximizing their net profits. Perkins (2006) provides a typical example of how profits from oil are split for every US\$ 100 of crude: 1) the oil company receives US\$ 75, 2) 0.75% of the remaining US\$ 25 is used to pay off debt, 3) US\$ 2.50 goes to health, education and other programs helping the poor and 4) the remainder goes to cover military and other expenses. Bond (2002) describes this as externalizing the environmental and social costs of extraction and production. Similar to how mineral resources in general have impacted development (see Section 13.5, FAILURE TO DEVELOP GOOD GOVERNANCE IN MINERAL RICH COUNTRIES), oil has hurt development (Gary & Karl, 2003) in the following ways:

- Raising expectations and appetite for spending;
- Increase public spending based on unrealistic revenue projections;
- Increase in public spending on “white elephant projects” and massive corruption;
- Volatility of oil prices hinders growth, distribution and poverty alleviation;
- Encourage the loss of fiscal control, inflation and budgetary deficits, further hampering growth, equity and the alleviation of poverty;

- Foreign debt grows faster in oil-exporting countries, mortgaging the future;
- Non-oil productive activities are adversely affected by the oil sector in a phenomenon called the “Dutch Disease”, pushing up the exchange rate (stronger local currency) and making other products non-competitive, especially in the agricultural and manufacturing sectors, while the oil industry provides little employment; and
- Petrodollars replace more stable and sustainable revenue streams, exacerbating the problems of development, transparency and accountability, since tax payers can no longer hold their governments accountable since they pay little or no taxes.

That is to say,

“Government institutions in the Gulf of Guinea are weak and sometimes inexperienced with oil contract negotiations. As oil becomes the dominant economic activity of a country and the leading export activity, governments become dependent on oil money as the main source of revenue and foreign exchange and as the economic basis of their power (Table 13.2). This dependence on oil revenues negatively affects the capacity of states and their ability to govern. The more governments spend, the more they need oil revenues...However, the volatility of oil prices – the rapid fluctuation from \$US 8 to \$US 35/barrel and back – further undercuts efforts to turn oil wealth into other more permanent forms of sustainable development” (Gary & Karl, 2003) (see Section 13.10.1.3 Oil and Repression in the Niger Delta – Nigeria and Chapter 12, Section 12.3.4, Structural Adjustment, U.S. Movement to Control Developing Economies).

Table 13.2: Economic dependence on oil by key African exporters, 2002 estimates			
Country	%GDP	%Exports	%Govt. Revenue
Nigeria	40	95	83
Angola	45	90	90
Congo Brazzaville	67	94	80
Equatorial Guinea	86	90	61
Gabon	73	81	60
Cameroon	4.9	60	20

Source: World Bank, IMF, CIA World Factbook 2002, U.S. State Department, U.S. Energy Information Administration. *In:* Source: Gary and Karl (2003) © Catholic Relief Services. Used with permission; all rights reserved.

If new oil revenues are to advance the development of Sub-Saharan Africa, the United States and others must promote transparency and the rule of law in oil-producing countries. It is sobering that the average Nigerian today is worse-off than 25 years ago despite the US\$ 300 billion in oil revenue that the country has generated since then (Royce, 2002; Gary & Karl, 2003), while per capita income remains less than \$1 a day and Nigeria has performed worse in terms of basic social indicators than Sub-Saharan Africa as a whole, “the paradox of plenty” (Gary & Karl, 2003).

“Social needs in Africa’s oil producing countries are immense. Roads and schools must be built, HIV/AIDS must be fought, and clean water wells must be drilled. New oil revenues could go far in addressing these pressing needs. The United States stands to gain from increased African oil production. We will gain the most, however, if these revenues are used to improve the lives of the Africa people, not corrupt African rulers” (Royce, 2002).

However, to date, money from oil has been spent on anything, but development.

“In the decade from 1984 to 1994, for example, OPEC members’ share of annual military expenditures as a percentage of total central government expenditures was three times as much as the developed countries, and two to ten times that of the non-oil

developing countries. From the perspective of poverty alleviation, the sheer waste of this military spending is staggering" (Gary & Karl, 2003).

In turn,

"oil rents have tended to impede democratization and have sustained a long line of authoritarian rulers – from the Shah of Iran to Nigeria's Abacha to the House of Sa'ud to Saddam Hussein. These regimes prohibit the types of organizations that provide a voice for the poor, create an informed civil society, and permit their people to influence the management and allocation of oil wealth...Fights over oil revenues become the reason for ratcheting up the level of pre-existing conflict in a society, and oil may even become the very rationale for starting wars" (Gary & Karl, 2003).

As will be seen from the "Case Studies" below, there will have to be a major change in how multi-nationals and Western governments relate to Sub-Saharan Africa, as it is they who have often been supportive of and/or ignore national corruption by African elite, regardless of the consequences to Sub-Saharan Africa's people. Shiner (2004a), of the Voice of America, sums up this issue very nicely:

"But the question remains whether revenues from the oil boom will reach Africa's poor. Corruption has bled Nigerians and Angolans of resources that could have dramatically improved education and healthcare. Gavin Hayman works for Global Witness, which aims to expose the link between natural resource exploitation and human rights abuses. He says, 'My main worry is where are the revenues from that oil development going and the oil money? One of the key problems is that American companies often sign confidentiality deals to work in countries like Angola, which means they don't disclose any info about revenues they're paying to government and government doesn't discuss any information about what it's received from the companies. And meanwhile billions of dollars are going missing that should be going for sustainable development and poverty alleviation.' "

13.10.1.1 Oil, corruption, multi-national complicity and backwardness in Equatorial Guinea

Equatorial Guinea, boosted by oil revenues ranks among the highest per capita GDP in the world, yet ranks near the bottom of the UN Human Development Index (HDI) (Harris, 2007).

“there are troubling signs that once obscure Equatorial Guinea, a traditional coffee and cocoa producer, may be falling prey to bad governance fueled by its recent oil revenue bonanza. Managing a flood of petrodollars and fending off corruption is not easy, but a deteriorating political and commercial environment could freeze African oil production if energy companies lose the stomach to invest in the region” (Royce, 2002).

The *Washington Post* newspaper reports that a grand jury is looking into whether bribes were paid by U.S. oil companies through accounts at U.S.-based Riggs Bank to the leader of Equatorial Guinea, Teodoro Obiang Nguema

“...President Teodoro Obiang Nguema founded the Democratic Party in 1987, eight years after he came to power in a coup that toppled his uncle, who was then executed. Equatorial Guinea, which has a population of just one million, is Africa’s third-biggest oil producer, but ordinary citizens have not benefited” (Colombant, 2004a).

It has been called the “Kuwait of Africa” (Tate, 2004).

Riggs National Bank of Washington, D.C. Linked to Laundering Oil Money

The Senate Permanent Subcommittee on Investigations found that since 1995, Riggs National Bank of Washington, D.C. helped Equatorial Guinea, its largest customer, siphon oil revenues amounting to US\$ 700 million through 60 accounts belonging to the government, the president, government officials and their

families. Riggs National Bank is also being investigated by the U.S. government as possibly laundering Saudi money used in terrorism. Equatorial Guinea has been cited by the U.S. State Department for human rights abuses, corruption and diversion of oil revenues to government officials. The U.S. Senate said this money should have gone to help impoverished Equatorial Guineans, but in fact, since oil came on-line, human development indicators have gone backwards (Tate, 2004). Equatorial Guinea was Riggs Bank's single largest depositor.

"At the same time, his country's inhabitants were wallowing near the bottom of almost every global index of health, literacy and life expectancy...Nguema survives in part because his tiny country pumps 350,000 barrels of oil a day and has reserves of 1.2 billion barrels, along with 1.3 trillion cubic feet of natural gas. As a result, oil companies and governments are willing to support a regime that has long since silenced the press, driven almost a third of its population of 540,000 into exile and crushed any hint of dissent" (Farah, 2006).

U.S. Secretary of State, Condoleezza Rice, called Obiang Nguema a "good friend" while being photographed with him during a recent visit to her office (Farah, 2006). The Riggs Bank name no longer exists, being taken over by a merger with PNC Bank in 2005.

Corporate Corruption

While Marathon Oil Company, Exxon-Mobil and Amerada Hess claim otherwise, Global Witness noted that the U.S. Senate Committee found that oil companies paid money into personal accounts of Equatorial Guineans that was used to buy land, lease offices and to educate children of the country's leaders (Tate, 2004).

"The Senate report calls on Congress to strengthen the Foreign Corrupt Practices Act to require that U.S. oil companies disclose substantial payments they make to foreign governments, or to

business ventures with links to foreign government officials or their family members" (Tate, 2004) (see Section 13.12.1, "Publish What You Pay" an Attempt at Developing Transparency in Distribution of Wealth From Africa's Natural Resources).

U.S. Government Employed PMC

The U.S. State Department granted a license to the U.S. private military contractor, Military Professional Resources Inc. (MPRI)⁵³⁸ of Alexandria, Virginia, to advise the government of Equatorial Guinea on building a coast guard to protect their oil-rich territorial waters, but the State Department turned down the proposal by MPRI for training of police and military forces on human rights grounds (Gary & Karl, 2003).

13.10.1.2 Gabon, France's Alaska

Gabon's per capita GNP of US\$ 3,300 as of 1985, is the highest in Sub-Saharan Africa. Gabon produces 9 million tons [\approx 180,000 barrels per day (bpd)] of oil annually. It is the second largest producer of crude oil in Africa and this produces 67% (2/3rds) of government revenue (on average 65% of total export revenues). Shell-Gabon and Elf-Gabon are major companies. Port-Gentil is the center for oil wells (Ministry of Tourism, 1995 *In:* DeGeorges, 1995). In 1992, petroleum exports of 14.6 million tons (\approx 292,000 bpd) totaled US\$ 1.8 billion of a total US\$ 2.2 billion in export earnings, amounting to 55% of GDP and 82% of export earnings (see Table 13.2: Economic dependence on oil by key African exporters, 2002). There are large onshore and offshore areas still to be exploited. Output was expected to increase to 17 million tons/year (\approx 340,000 bpd) over the next five years (U.S. Embassy Gabon, 1993 *In:* DeGeorges, 1995).

⁵³⁸ Military Professional Resources Inc. (MPRI), 1201 East Abingdon Drive, Suite 425, Alexandria, VA 22314, and 11 Canal Street Center Plaza, Suite 301, Alexandria, VA 22314, Tel: Toll Free 800.634.2874 or local at 703.684.0853, <http://www.mpri.com/>.

France's Alaska

The French consider Gabon as their territory. After independence in 1960, Gabon did not want to be independent. It was a safe place to live and the local population was low, so many “Blue Collar” French stayed and became rich and their children were born and lived here. France does not want Americans competing with them. Anyone entering into Gabon needs a French partner or will fail. The French and thus Gabon will do everything possible to discourage Americans, such as off loading freight destined for Libreville at Port-Gentil or Point Noir. The French consider oil in the Gulf of Guinea, “Their Alaska” – a strategic resource, and will protect oil at all costs (Harding, *pers. comm.* In: DeGeorges, 1995)⁵³⁹ (see Section 13.10.1.4, Petroleum war, Congo Brazzaville).

Normally oil leases are put up for bid, but in 1993, the French firm of ELF/Gabon was awarded a non-competitive lease for 13 blocks. At the time, only four U.S. firms were left, including Oxypetroleum, Conoco and Mobil that was only distributing oil (U.S. Embassy Gabon, 1993 *In: DeGeorges, 1995*).

“Gabon and Elf Gabon were also giant piggy banks that allowed Elf and France to conceal bribery and wield other tools such as mercenary and arms-dealing services, either in pursuit of oil deals or towards more overtly geopolitical ends” (Transparency International, 2004),

including uncovered payments to politicians in Africa, Central Asia, China, France, Germany, Russia, Spain, Taiwan, the United States and Venezuela. The Elf “system”, in place since the 1960s, had two other purposes; the covert financing of France’s main political parties and secret services, plus personal enrichment of French politicians and elites (Transparency International, 2004).

⁵³⁹ Peter Harding, Second Secretary, in charge of Economic and Commercial Affairs, U.S. Embassy.

Other major resources available from Gabon include manganese, uranium, phosphate, iron, baritone, gold, lead, chromium, diamonds and timber (DeGeorges, 1995).

President Bongo, Africa's longest serving head of state since 1967 (believed second longest reign in modern times after Fidel Castro of Cuba, leader since 1959), concerning an attempt by America to drive the French from the African continent, has said (Madsen, 1999)

“ ‘how else can you explain that the slightest spark in this part of the Continent is immediately fanned.’ ”

Bongo is said to be on the American hot target list (Madsen, 1999). As noted, U.S. Secretary of State Colin Powell's visit to Gabon after the 2002 Earth Summit and his pledge of US\$ 50 million to save Gabon's forests and biodiversity, could very well be the beginning of the “poker match” for the takeover of this resource rich country from the French by the United States. As will be seen, America lost the match in Congo Brazzaville.

Gabon's Oil Running Out

However, Gabon's oil is beginning to run out. Production has dropped by 33% (1/3rd) and government revenues 50% (1/2) in the last five years and may fall by half (50%) again by 2006. Gabon could be in real trouble, suffering from the “Dutch Disease” and is a classic “enclave economy”, due to both the lack of linkages with other productive economic sectors and the physical isolation of rigorously defined areas of production. With the exception of the exploitation of forestry resources (the country's second economic sector) and the declining mineral sector, all economic activity is concentrated in the heavily circumscribed urban centers (Gary & Karl, 2003). Only about 1% of total land area is under cultivation, depending entirely on imports for its food. President Omar Bongo has

squandered Gabon's wealth. Once garnering the title of the "world's largest per capita importer of champagne", it faced bankruptcy a number of times. Like Congo Brazzaville, despite its oil revenue, Gabon has managed to borrow against its future oil production, spending more than it makes, with the net result that more than 50% of Gabon's 2003 budget is earmarked for debt service (Gary & Karl, 2003). There is concern that both those inside the patronage circle, as well as those left out from oil riches in the past, understand that there will be no future benefits for either. This could put Gabon's much vaunted "stability" to the test (Gary & Karl, 2003).

13.10.1.3 Oil and Repression in the Niger Delta – Nigeria

Nigeria has always been a somewhat ethnically divided country, with the Hausa/Fulani in the north, Yoruba in the west and Ibo in the east. This has been fueled by colonialism (see Chapter 3, Section 3.1.4.2, Anglophone Africa). The Ibo tried seceding in 1966, declaring this area as the independent state of Biafra, which lead to a war. As the French were uneasy about a large English-speaking area in the midst of Francophone Africa, France backed Odumegwu Ojukwu, who led the succession, encouraging Gabon and the Ivory Coast to do the same. France supplied arms and legitimacy to the succession. Oil, a market for French goods and *Francophonie* were at stake. Ultimately, the succession failed and Nigeria became the 6th largest oil producer in the world, while the corrupt elite siphoned off the wealth, leaving 90 million underfed people, a slim middleclass and a fringe of multimillionaires (Rosenblum & Williamson, 1987).

Oil Enriched Elite, Disenfranchised Poor

Oil, gold and diamonds, not a commitment to democracy, seem to guide America's relationship with many of Africa's quasi-dictatorships, including Nigeria (Madsen, 1999). In a recent news interview, Britain's Tony Blair called Nigeria a fine example of democracy in Africa (Blair, 2002).

Currently, 90% of the national wealth is estimated to be in the hands of only 10% of the population, a small oil-enriched elite and their networks, with \$3 billion/year going to debt servicing of foreign loans and billions in overseas assets stolen by former military rulers. Nigeria owes about \$29 billion to foreign creditors, many loans they knowingly provided to corrupt and repressive governments. Meanwhile, poverty has increased from 28% in 1980 to 66% in 1996 and to about 70% of the population in 2000, while an average of three million people/year enter a saturated job market without skills (Booker & Minter, 2003). Likewise, Harris (2007) concludes despite this incredible oil revenue that amounts to hundreds of billions of dollars over the last 30 years, much of which has been squandered, 70% of Nigeria's population lives on less than US\$ 2/day. As of the year 2000, Nigeria was spending less than 1% (national target 15%) of its GDP on health and less than 1% on education, with more than 2.5% going to pay off foreign debts. The "democratically elected" Obasanjo government (replaced in questionable elections by Alhaji Umaru Yar'adua in 2007) has apparently begun putting into place anti-corruption measures, though Nigeria still ranks as the second most corrupt government in the world (Booker & Minter, 2003); the 3rd most corrupt in 2004 [see Chapter 11, Table 11.2: 2004 Corruption Perception Index (CPI)].

Nigeria ranks 13th in the World in oil production, but number one in Africa, producing low-sulfur crude oil (Richards, 2002 *In: Zack-Williams, et al.*, 2002). In 2002, Nigeria was the 5th largest supplier of oil to the U.S., ranking only behind Canada, Saudi Arabia, Mexico and Venezuela. It produces over 2 million barrels of oil/day with a little less than half of this going to the USA. In the last two decades, oil has supplied more than 90% of Nigeria's export earnings and more than 80% of federal government revenues. However, Nigeria's oil industry employs only about 100,000 people out of a population of over 100 million

(Guest, 2004). As it is dependent on one raw product, as much of Sub-Saharan Africa, Nigeria faces a boom or bust economy, with crude oil prices varying widely on the international market; US\$ 10/barrel in January 1999, almost US\$ 29 a barrel in September 2002 (Booker & Minter, 2003) to over US\$ 40/barrel in mid-2004, over US\$ 60/barrel by mid-2005, surpassing US\$ 75/barrel by April 2006 (Read, 2006) and over US\$ 80/barrel by mid-September 2007 (see Chapter 12, Figure 12.1: Sub-Saharan Africa's "Terms of Trade" by country group, 1965-1997). It is estimated that the Iraq war has raised the global price of oil by at least US\$ 5-10/barrel (Carothers, 2007).

Oil Wealth Linked to Reduced Food Self-Sufficiency

Nationally, in the last three decades, over-dependence on oil to drive Nigeria's economy has eroded the country's capacity for food production, leading to a decline in agricultural exports such as cocoa, palm oil and peanuts (Booker & Minter, 2003). Agriculture was abandoned in favor of importing food, which in the early 1980s amounted to US\$ 2 billion/year. This worked fine until the oil shock of the mid-1980s when the price fell from US\$ 25 to below US\$ 9/barrel. Corruption and anarchy reigned (Rosenblum & Williamson, 1987). Manufacturing also declined, with capacity utilization dropping to 30% or less. At the current rate, Nigeria's known reserves will be exhausted in only 30 years. Nigeria's almost 130 million people make up nearly 17% of Africa's population (Booker & Minter, 2003). Unless Nigeria starts planning for the future, it may have no future. The stage is set.

Oil and Environmental Degradation in the Niger Delta

If one looks at a global satellite picture at night, northwestern Europe and much of the USA are covered with light, while other than the Nile Valley and Johannesburg, the rest of the continent is “Dark”. Lagos and Nairobi are pinpricks of light. The western half of Africa is totally blank. The one blaze of light that rivals North America or Europe comes from the natural gas being flared from the Niger Delta (Nigeria) oilfields by a country and industry heedless of the environmental consequences or energy requirements of future generations (Richards, 2002 *In: Zack-Williams, et al.*, 2002).

There is a long and terrible record of environmental destruction and human rights violations in the oil-producing regions of Nigeria. The gross level of environmental degradation caused by oil exploration and extraction in the Niger Delta has gone unchecked for the past 30 years. Repression still continues. Evidence shows that the oil companies operating in Nigeria have not only disregarded their responsibility towards the environment, but have acted in complicity with the military’s repression of Nigerian citizens. The profit-driven collusion between multinational oil companies and the past and present Nigerian governments has cost many lives and continues to threaten the stability of the region (ANON, 1999):

- Oil corporations in the Niger Delta seriously threaten the livelihood of neighboring local communities. Due to the many forms of oil-generated environmental pollution evident throughout the region, farming and fishing⁵⁴⁰ have become impossible or extremely difficult in oil-affected areas and even drinking water has become scarce. Malnourishment and disease appear common.

⁵⁴⁰ One of the world’s largest wetlands and mangrove forests (Booker & Minter, 2003).

- The presence of multinational oil companies has had additional adverse effects on the local economy and society, including loss of property, price inflation, prostitution and irresponsible fathering by expatriate oil workers.
- Organized protest and activism by affected communities regularly meet with military repression, sometimes ending in the loss of life. In some cases, military forces have been summoned and assisted by oil companies.⁵⁴¹
- Reporting on the situation is extremely difficult due to the existence of physical and legal constraints to the free passage and free circulation of information. Similar constraints discourage grassroots activism.

The net result has been oil leaks polluting local water and damaging the fisheries (Binet, LeReste & Diouf, 1994; ANON, 1999), gas flaring that could be a source of energy for local communities, but which is dumping climate-impacting CO₂ into the air, resulting in acid rain (ANON, 1999).⁵⁴² Respiratory problems, coughing up blood, skin rashes, tumors, gastrointestinal problems, cancer and malnourishment are common ailments. Many children have distended bellies and light hair, which are evidence of kwashiorkor, a protein-deficiency syndrome. Residents attribute the spread of kwashiorkor to the drastic decline in fish catch and agriculture from the pollution of rivers, ponds, seawaters and land by oil industry operations. The Niger Delta has the third largest mangrove forest in the world and the largest in Africa. Mangrove forests are important for sustaining local communities because of the ecological functions they perform and the

⁵⁴¹ Repression by Sub-Saharan African governments and their appointed enforcers (e.g., safari, tourism and mining companies, government military and game officials) is common practice throughout the subcontinent (see Chapter 11, Section 11.11.5, Transfrontier Conservation Areas (TFCAs), Southern Africa and Section 11.11.6.2, Modern conservation and the Baka Pygmy and Section, 11.11.6.3, Failure to integrate Baka into managed bushmeat harvests and Section 11.11.6.13, Let the Pygmies be the guardians of the forest and Section 11.11.7.3, Collusion between WCS, CIB and unsustainable logging/conservation).

⁵⁴²AOPIG (2002) in recommendations to the U.S. Congress suggested that “U.S. companies should be encouraged to invest more in capping of flared gas flows, and African countries to move toward the establishment of a regional gas grid”.

essential resources they provide, including soil stability, medicines, healthy fisheries, wood for fuel and shelter, tannins and dyes and critical wildlife habitat (see Chapter 7, Section 7.9.7, Dam Impacts on Estuarine and Marine Fisheries). Oil spills are contaminating, degrading and destroying mangrove forests. Endangered species—including the Delta elephant, the white-crested monkey, the river hippopotamus and crocodiles—are increasingly threatened by oil exploitation. Since Shell came to Iko in Akwa Ibom State in 1974 to establish oil wells, repeated oil leaks have coated the breathing roots of the mangroves, killing off parts of the forest and the animal and marine life that depend on the detrital system linked to these trees. Women used to sustain their families through farming and trading in agricultural and other goods, but each of these is now extremely difficult with the effects of oil industry pollution (ANON, 1999). The adverse impacts of the petroleum industry on the environment and cultures are not unique to the Niger Delta. Perkins (2006) describes similar destruction among Amerindians in the Amazon basin.

“The international outcry at the hanging of Ken Saro-Wiwa and other Ogoni activists protesting the despoiling of their Niger Delta lands and other events have had bottom line impacts on the industry. Some estimates suggest that militancy and protest has cut onshore oil production by 33% (a third), 700,000 plus bpd, in 2001-3” (Gary & Karl, 2003).

The **main multinational oil companies operating in the region** are: 1) Shell (accounting for more than 40% of the volume of production), 2) Mobil and 3) Chevron, in that order. Other companies with significant presence in the Delta are the 4) Italian company, Agip, 5) France’s Elf-Aquitaine (commonly known as Elf⁵⁴³) and 6) Texaco. All of these companies operate on the basis of a joint venture with the Nigerian government (ANON, 1999). U.S. government agencies have increased cooperation with Nigerian authorities to manage disorder in the

⁵⁴³ Today called “Total”.

Niger Delta oil production through contracts with Military Professional Resources, Inc. (MPRI). MPRI is a U.S.-based security company that also has a contract with the Nigerian government to retrain its army – basically a mercenary group (Reno, 2000 *In: Cilliers & Dietrich, 2000*), now called Private Military Companies/Contractors (PMCs) that have become legitimized in modern Western society as part of the military-industrial complex that keeps raw resources flowing from the Third World to First World economies.

“The U.S. Defense Department, according to the details of the August 2000 (PMC) contract, was to pay half of the estimated \$US 8 million price tag, with the Nigerian government paying the other half” (Dare, 2002).

For the communities, oil companies are the most visible manifestation of central government operating joint ventures; oil installations guarded by federal police or soldiers and the rapid response from the federal or state government if there is any threat to oil production. They conclude that oil companies and the government is effectively the same thing. They accordingly make demands for greater revenue allocation and compensation for damage wrought by oil production—from the oil companies and government. They blame the oil companies and government for the repression. The communities are aware that oil companies are making large profits out of what they see as “their” oil and believe that these profits bring with them responsibilities towards the traditional landholders (Human Rights Watch, 1999). The same is happening all across Sub-Saharan Africa with other mineral resources, as well as timber, wildlife and fisheries. The winners are African elite and Western economies, while the losers are the rural Africans living in abject poverty among this incredible wealth.

A few individuals in their communities, the contractors (roughnecks on the oil rigs) and “traditional rulers”,⁵⁴⁴ have profited handsomely from oil production, while for the majority the land has become less fertile and fish catches have declined. Communities want compensation for loss of livelihood caused by land expropriations, oil spills and other effects of oil production, yet are forced to accept assessments of compensation valued by the oil companies with no meaningful way of obtaining an independent determination of their loss. The few school blocks and unfinished water schemes do not satisfy their view of what an “oil producing community” should look like. While most requests for compensation or assistance are settled peacefully, but often unsatisfactory, community members sometimes shutdown flow stations, take hostages, or commit criminal damage as political statements of their right to participate in the prosperity currently restricted to a small elite (Human Rights Watch, 1999; Booker & Minter, 2003).

The first responsibility for resolving these injustices lies with the Nigerian government. Yet the multinational oil companies operating in Nigeria cannot avoid their own share of responsibility. It is not enough simply to say that the political environment in Nigeria makes it difficult for the oil industry to alter government policy towards the oil regions. In fact, oil companies contribute toward discontent in the Delta, and to conflict within and between communities that result in repressive government responses. Companies have a duty to avoid both complicity and advantage from human rights abuses (Human Rights Watch, 1999).

⁵⁴⁴ The term “traditional ruler” in the 21st century is a misnomer, since many chiefs are no more than lowly paid government bureaucrats, having lost allegiance to their constituencies long ago (see Chapter 3, Section 3.1.4.1, Francophone colonial Africa and Section 3.1.4.2, Anglophone Africa and Chapter 11, Section 11.3, NEO-IMPERIALISM IN SUB-SAHARAN AFRICA and Section 11.4, ECONOMIC DEVELOPMENT AT INDEPENDENCE).

“ ‘At the end of the day, as over much of Africa land and resource tenure are the real issue. With colonialism and neo-colonialism - our own people taking control of resources undemocratically - it has led to communities losing their land to governments and corporations,’ said Oronto Douglas, deputy director of a group called Environmental Rights Action in Nigeria...To help avoid this, Mr. Douglas of Environmental Rights Action says local communities must have the right to control their resources. ‘What needs to be done in Nigeria and all of Africa is the need to ensure that all citizens have their rights protected,’ he said. ‘Citizens in Nigeria and the rest of Africa don’t have citizenship rights. The elite, a few people, grab power and decide for the majority. So what we’re saying is there has to be the institutionalization of democracy’ ” (Shiner, 2004b).

As discussed in some detail in Chapter 9 (see Section 9.7.2.1, Devolution through policy reform, land and resource tenure), this implies devolution of ownership and the right to economically benefit from the sustainable exploitation of land and resources to the level of local communities.

The oil fields of the Niger Delta and the diamond mines of Sierra Leone/Liberia have one thing in common – dispossessed young people who see the generation of global wealth under their noses and yet see little prospects for the future with little opportunity for education or job opportunities. In addition to immigrating to cities, where uneducated youth hustle or often turn to crime, “rural hot spots”, such as the Niger Delta and other mineral rich hot spots in the forests of Central Africa, serve as a boiling cauldron of discontent. Here, they fence stolen goods, trade in illegal guns and drugs, or partake in clandestine mining, among other activities. Nigeria has become a major international transshipment point in the global drug trade and in money laundering. Many of the rebels and malcontents are students who would rather be furthering their education and working than fighting, but there is little or no financial support from governments (Richards, 2002 *In: Zack-Williams, et al., 2002*). Likewise, these “hot spots” are also

centers of malcontent youth, easy recruits for terrorist organizations and rebel groups alike (see Section 13.3, CAPITALISM WITHOUT A CONSCIENCE).

Many ethnic groups in the Niger Delta have produced declarations and bills of rights that call for autonomy in the management and control of local natural resources. The survival of a large number of Niger Delta communities is now dependent on their ability to establish their entitlement to local resources. In 2004, a militant leader, Moujahid Dokubo-Asari, called for the region's secession as the only way to bring about control over the oil wealth that escapes the masses;

“ ‘The Nigerian state has deliberately impoverished our people...It is only violence that makes the tyrant listen,’ ” he says (Timberg, 2004a).

In April 2006, The Movement for the Emancipation of the Niger Delta (MEND) turned down President Olusegun Obasanjo’s offer of a \$1.8 billion highway through the vast wetlands region and 20,000 new jobs. According to MEND

“ ‘What we have demanded...is the control of our resources, which the Nigerian government has so far ignored’ ” (Ashby, 2006).

MEND is responsible for major attacks on oil installations that have resulted in a 25% decline in Nigeria’s oil production since early 2006, helping increase global oil prices (Simpson, 2007).

Delta youth leader and president of the Niger Delta Youth Council, Mike Ekamon, says,

“ ‘We own the land, we know our problems...You do not pick governors and ministers to come and instill power in the people. You pick those people. Call the youth’s proper. Call the *egbesus* (militants), those people you call militants, if you pacify them, the

problem will be put off immediately. But if you do not pacify them, they will continue fighting in the creeks' " (da Costa, 2006).

13.10.1.4 Petroleum war, Congo Brazzaville

"Congo Brazzaville is one of the petro-states most closely associated with the legacy of influence peddling and dirty deals in Africa by the now-notorious French state oil company Elf Aquitaine (now Total). Elf treated Congo as its colony, buying off the ruling elite and helping it to mortgage the country's future oil income in exchange for expensive loans. The company even financed both sides of the civil war, as it also did in Angola", (Global Witness, 2004).

In June/July 1996, the principal author was in Congo's capital, Brazzaville, now with rundown bullet pockmarked and mortared buildings, but once a beautiful town with whitewashed buildings, the headquarters of Charles de Gaulle and the Free French during WWII. One day while walking through town, soldiers armed with automatic weapons suddenly appeared and there riding in an open vehicle waving his hand was President Jacques Chirac of France. One might wonder what he was doing there, but expatriates living there knew the reason for his coming very well – one of the largest offshore oil fields ever found in the Gulf of Guinea had just been discovered and France's President was there to make sure Elf retained control over this country and its oil fields.

The economy of Congo is based almost entirely on the exploitation of its natural resource base. The petroleum sector dominates the economy (see Table 13.2: Economic dependence on oil by key African exporters, 2002) and because it borrowed heavily, based on oil collateral, this was responsible for a debt of US\$ 6.26 billion in the mid-1990s (MEF/NNP, 1995). It is unclear where this borrowed money went, since there is little sign of development. One can guess, as with much of the wealth in Sub-Saharan Africa, that it took an "overseas flight" into Swiss bank accounts of the power elite or homes on the Riviera, with

no accountability to the citizens of the Congo. As a result, according to the Forest Monitor (2001),

“Although Congo (Brazzaville) was the fourth largest oil producer in Sub-Saharan Africa in 1999 (IMF, 2000), the country remains highly indebted to International Finance Institutions (IFIs) and debt arrears continue to escalate. At the end of 1999, its total external debt amounted to CFA Fr 3,357 billion (US\$ 4.36 billion), equivalent to 246% of its GDP, with arrears of CFA Fr 1,279 billion (US\$ 1.66 billion)” (IMF, 2000).

This former French colony sits on top of the largest oil reserves in Africa and France considers it a cornerstone in “its temple of influence” (Madsen, 1999). Congo Brazzaville is currently Sub-Saharan Africa’s third largest oil producer after Nigeria, Angola (Gary & Karl, 2004) (see Figure 13.4: Oil production in Africa). Economic ambitions of Congolese leaders are regarded as one of the main driving forces of the civil war that followed. Competition for scarce resources has been made more desperate by the International Monetary Fund (IMF)’s insistence on budgetary austerity and cuts in the numbers and pay of civil servants (ANON, 2001a), better known as structural adjustment (SAP).

France’s *Chasse Gardeé*

The French company Elf controls 75% (3/4’s) of the Congolese oil production and, therefore, represents one of the main sources of income for this Sub-Saharan African country. The links between the French multinational and the country’s government are many, visible and invisible. Since Sassou Nguesso became President of the “People’s Republic” of Congo, the relations between the government and the company could not have been better (ANON, 1997).

U.S. Attempt to Displace French Domination

When U.S. educated (see Section 13.8.2.2, America declares the end of France's *chasse gardeé*) Pascal Lissouba took over as President in 1992, he began to open the country's oil industry to other firms, including (American-based) Occidental Petroleum, Exxon and Chevron, as well as Shell (Madsen, 1999; Ross, 2002). By 1994, American investment in the Congo, mainly in the oil sector, was US\$ 550 million, expected to rise to US\$ 1 billion within five years (*Washington Times*, 1995c). Lissouba's close relationship with the Americans infuriated France, which had just lost Rwanda to an American-backed and English-speaking regime that, along with Uganda, would soon be moving in to take over the Democratic Republic of Congo for the Americans. France decided at all costs not to let Congo Brazzaville fall to the Americans.

Elf supported Denis Sassou-Nguesso's bid to replace Lissouba in order to protect, or regain, its dominant position in the Congolese oil industry (Madsen, 1999; Musah, 2000 *In:* Musah & Fayemi, 2000; Ross, 2002); conversely, Sassou-Nguesso helped finance his bid for power by selling Elf access to future oil rights (Ross, 2002). In 1995, Mobutu Sese Seko (Overthrown May 16, 1997), who by then was pro-French and anti-American, worked with Elf to finance Sassou-Nguesso's forces, while the French military *attaché* in Brazzaville clandestinely shipped arms via Burundi (Madsen, 1999). Was Elf backing Sassou-Nguesso for commercial reasons, or acting on behalf of the French government for political reasons? Until 1994, Elf was a state-owned company and worked closely with the French government to promote French political interests in Africa. It was, however, privatized in 1994 and its new leadership adopted a more commercial approach to Elf's relations with foreign governments. Elf's involvement in the Congo war has been scrutinized in both the media and the French and Belgian courts; with no evidence to suggest that Elf's support for Sassou-Nguesso was on

behalf of, or at the direction of, the French government (Ross, 2002). Madsen (1999) seems to believe that there was French government involvement (see below).

Angola also sided with Sassou-Nguesso for two reasons. First of all, Elf is also one of the main companies exploiting the oil resources of Angola, but most importantly is that Angola's intervention in the Congo allowed it to smash a great deal of the remaining National Union for the Total Independence of Angola /*União Nacional Para a Independência Total de Angola* (UNITA) forces still operating from this country against the Angolan regime. After Mobutu Sese Seko's fall in 1997, Angola blamed Lissouba for being the sole supporter of UNITA and the Cabinda secessionist movement – the Front for the Liberation of the Cabinda Enclave/*Frente de Libertacao do Enclave de Cabinda* (FLEC) (Madsen, 1999).

With the ouster of Mobutu Sese Seko, Laurent Kabila's Democratic Republic of Congo (DRC - former Zaire and now an American puppet) sided in this war with Pascal Lissouba, early on in Lissouba's presidency, sending in a few hundred troops to put down Sassou-Nguesso's private militia. This could seem surprising, as this put him in opposition with Angola that supported his campaign to overthrow Mobutu Sese Seko in the former Zaire. This can only be understood in the context of the French-U.S. rivalry in Africa. Mobutu Sese Seko's overthrow was a blow against French interests in the area, while Laurent Kabila was supported by those countries in the U.S. sphere of influence (mainly Uganda and Rwanda). Kabila, therefore, chose to oppose France's interests in this conflict (ANON, 1997; Madsen, 1999). However, in a surprise turn around, Kabila, America's ally in the Democratic Republic of Congo, threw his weight behind Angola and Sassou-Nguesso. The Defense Intelligence Agency (DIA) of the U.S. realized that it had created a figurative "Frankenstein's monster" (Madsen, 1999).

Laurent Kabilas life span as a President of the Democratic Republic of Congo would be short-lived, catching an assassin's bullet. It would not be too hard to speculate who supported it and from where it came.

Shortly before the 1997 presidential elections, President Lissouba set about renewing his mandate regardless of the cost. Denis Sassou-Nguesso, after a seven month trip to France, also reassumed his responsibilities.

"The country's former strongman was already campaigning in both the north and the south of the Congo. A number of Congo Brazzaville's districts were mobilized to support him. Total anarchy reigned. Weapons were distributed and young people were recruited to swell the ranks of the 'Cobras,' the pro-Sassou-Nguesso militia" (ANON, 2002b).

Conflicting American Policies

Meanwhile, while American oil companies were being supported by Lissouba in accessing Congo Brazzaville's oil fields, support to Sassou-Nguesso was provided by American supporters, Maurice Tempelsman,⁵⁴⁵ a wealthy Belgian Jewish immigrant to America who had two diamond companies – Lazare Kaplan Inc. (supplied diamonds to Tiffany and Cartier) – and Leon Tempelsman & Son, as well as by American Mineral Fields owned by Jean-Raymond Boulle, a Mauritian *émigré* with British citizenship who operated out of President William (Bill) Jefferson Clinton's home town of Hope, Arkansas. This would make sense if the goal was to rid Angola of UNITA to allow them access to the diamond fields. Added to this support was the Military Professional Resources Inc. (MPRI), a U.S.-based PMC operating in Angola, headed by retired General Harry Soyster, former director of the Defense Intelligence Agency (DIA). MPRI contracts directly to the CIA and DIA – doing America's dirty work when it is of political

⁵⁴⁵ A long-time Democratic Party fundraiser (Ruppert, 2004).

expedience for the United States to avoid direct involvement (Madsen, 1999). Also linked to support of Luanda and its Brazzaville ally (Sassou-Nguesso) was Boston-based Citizens Energy International Inc. (CEII), a non-profit holding company of groups involved in oil hustling. Joseph Kennedy (son of Robert Kennedy and former U.S. Congressman) was the founder of CEII (Madsen, 1999).

Why was this dichotomy of Americans supporting both sides? The causes appear to have been: 1) A large intelligence bureaucracy with conflicting policies, 2) American factions in Angola supporting the ouster of Lissouba as a means of cutting off supply lines that would result in the demise of UNITA in Angola as a means of getting at its diamonds and oil and 3) Dropping a loser and going with the winner in order to save face and more importantly, have an outside chance of continuing to get some oil out of Brazzaville, even under French influence (Madsen, 1999) (see Section 13.10.1.5, Resource war – Angola oil and some diamonds - for more detailed discussions of these interests in Angola).

When the civil war broke out, the United States found itself supporting Angola on one hand (that was supporting Sassou-Nguesso) and on the other hand, directly supporting Lissouba (Madsen, 1999). Whores have many lovers. Because of Lissouba's ties to Occidental Petroleum, both the Defense Intelligence Agency (DIA) and National Security Agency (NSA) – both of the U.S. - provided Lissouba with high grade intelligence, while contributing US\$ 10 billion in weapons via Israel through Kampala to his cause (Madsen, 1999). Madsen (1999) believes this is what happens when the intelligence bureaucracy becomes too large and different agencies have conflicting policies.

In another strange twist, with the not-so-hidden hand of the U.S. (as in Rwanda), the United States refused to allow UN peace keeping forces to go into Congo

Brazzaville that would have helped keep Lissouba in power – one hand not knowing what the other was up to and/or was it what Madsen (1999) calls “Washington was playing an all-too-familiar double game in Congo (Brazzaville)”?

Meanwhile, the U.S. in 1997 began assisting Angola and Sassou-Nguesso with its paramilitary forces in Cabinda and stepping up pressure on UNITA, both actions allowing Luanda to divert more support to its campaign against Lissouba (Madsen, 1999). Was the handwriting on the wall? Since Lissouba was on his way out, was it better to help a winner than to back a loser? The collapse of Lissouba, in turn, cut the supply lines to Savimbi, resulting in UNITA’s rapid demise (Madsen, 1999). Thus, what had been a lose/lose situation for the U.S. became win/win; they helped get rid of Savimbi’s UNITA to access diamonds, while jumping on the bandwagon in hopes of getting some “Brazzaville oil crumbs” from Sassou-Nguesso and Elf whom they had originally tried to defeat. Madsen (1999) calls this a classical DIA double cross.

Civil War of 1997

In desperation, Lissouba visited Paris in September 1997, but President Chirac refused to meet with him or recognize him as President of Congo Brazzaville. Madsen (1999) estimates that France and Elf bankrolled Sassou-Nguesso to the order of about US\$ 150 million (Madsen, 1999)

“ The first four months of the war (in 1997) cost 10,000 lives, displaced 800,000 people, and destroyed much of Brazzaville, the capital city. Following a brief lull, war erupted again the following year, until a cease-fire took hold in November, 2000. The war began with a confrontation between government forces, loyal to President Pascal Lissouba, and the ‘Cobras’ a private militia of Denis Sassou-Nguesso who had been Congo’s President from 1979 to 1992” (Ross, 2002).

Lissouba also had his own private militia, the “Zulus” (Madsen, 1999). Lissouba was unable to find anyone to purchase US\$ 50 million in oil futures needed for arms purchases. He was rapidly losing the war and was perhaps too risky to bet on. Had he succeeded in selling the oil futures, the war may have been even longer and costlier than it was (Ross, 2002).

Denis Sassou-Nguesso’s military superiority won with support from Chad, Hutus from Rwanda and Angola. The fall of Pointe-Noire on the coast, economic capital of the country and the center of petroleum production, temporarily ended the civil war (ANON, 2002b). He also had support from French legionnaires, who had headquarters at Brazzaville’s Maya-Maya airport under the cover of evacuating foreigners, but really to help Sassou-Nguesso (Madsen, 1999). Madsen (1999) and Huliaras (2002 *In: Zack-Williams, et al.*, 2002) believe that France, which in June 1997 used its army to evacuate citizens from the country while remaining neutral to the civil war, was actually able to support opposition forces led by ex-President Denis Sassou-Nguesso, who favored French influence, and ultimately Elf as the main exploiter of petroleum on its continental shelf. France immediately recognized Denis Sassou-Nguesso as Congo’s legitimate President. This swift action, in contrast to the international community’s wait-and-see policy and veiled protestations, merely reinforced suspicions that France was guilty as charged – namely of supporting the short-term interests of the oil industry.

Before a Supreme Court, which he set up, Denis Sassou-Nguesso took the oath of office on 25 October 1997, combining the posts of President of the Republic, Head of Government, Defense Minister and Commander-in-Chief of the Armed Forces. His power consolidated, the constitution abolished and institutions dissolved, a government of former enemies was formed and a National Transitional Council was set up for elections based on a “single list”. Defeated,

Pascal Lissouba and the other presidential hopeful Bernard Kolelas left the country together with their personal bodyguards. A police state had replaced war, but peace had not yet been declared (ANON, 2002b).

“Denis Sassou-Nguesso’s party has only a restricted electoral base confined to the small population in one part of the river basin and plateaus regions and to the immediate north of Brazzaville. The south of the country, which is more densely populated, generally supported the opposition. The Nibolek (the Niari, Bouenza and Lekoumou regions in the west) was the fiefdom of Pascal Lissouba, while the Pool region and areas to the south of Brazzaville were traditionally linked to Bernard Kolelas. Only the capital, where its neighborhoods are divided along extreme ethnic lines, symbolized north/south opposition.

Unity in the two main subdivisions of the country is not seamless, which explains conflicts within the regions. Indeed, the minorities in the north willingly ally themselves with those of the south to try to gain overall control. From a cultural standpoint, differences between the Kongo-dominated south and the north, where the Mbochi and the river people have finally gained the upper hand over the Teke, are extreme. This two-way split in the country is further reinforced by the combination of spilt blood, communal vengeance and passionate ethnic division in public life. The bitter struggle for power, ultimately the only genuine key to economic wealth, has thus exacerbated division in Congo. It has also greatly handicapped any attempt at building or rebuilding national unity, a condition desired by most Congolese” (ANON, 2002b).

Although former senior Elf officials have been jailed in France for “ ‘misuse of company assets,’ ” their legacy endures. Despite huge existing debts and a supposed program of cooperation with the international community to restructure Congo’s finances, the Congolese government has entered into deals to avoid financial scrutiny from the international community and its own citizens. The national oil company *Société Nationale des Pétroles du Congo* (SNPC) makes a multi-million dollar profit, but, according to the IMF, does not pay a single penny of this money into the government’s coffers (Global Witness, 2004).

It becomes clear from this case study that Washington's and France's true interests lay not in the democratic process in Congo (Brazzaville), or for that matter in any other country in the region, but what lies underneath the African land mass and its coastal waters; diamonds, oil, gold, and other resources (Madsen, 1999). This is the tragedy of living in a country so richly endowed – the democratic process is not allowed to evolve as the superpowers vie for control of this wealth at the cost of Africa and its citizens.

13.10.1.5 Resource war – Angola oil and some diamonds

Until the 19th century, Angola served as a slave pool for Portugal's most lucrative economy, Brazil, while its metals and gemstones were plundered. The market dominant minority of 335,000 Portuguese colonialists ruthlessly ran Angola's economy, departing in mass when Angola was granted independence in 1975, taking with them the skills needed to run the country. They left Angola to disintegrate into a brutal civil war (Chua, 2003) that became ethnically divided as various impoverished ethnic groups in the guise of political movements such as the Popular Movement for the Liberation of Angola /*Movimento Popular da Libertaçāo de Angla* (MPLA), the National Union for the Total Independence of Angola /*União National Para a Independēcia Total de Angola* (UNITA) and the National Front for the Liberation of Angola/*Frente Nacional para a Libertaçāo de Angla* (FNLA), representing almost exclusively the Mbundu, Ovimbundu, and Baongo (Bakongo) ethnic groups, respectively. These groups vied to access the previously denied wealth of the country, while being used as pawns in the ideological Cold War chess game played out on the continent between the East and West.

“The war in Angola began in the 1960s as a struggle against Portuguese colonial rule. Shortly after Angolan independence in 1975, it turned into a battle between the government – Liberation of Angola /*Movimento Popular da Libertaçāo de Angoia* (MPLA), which was backed by the Soviet Union and Cuba, and the rebel National Union for the Total Independence of Angola (UNITA – *União Nacional para a Independência Total de Angola*), which was supported by the U.S. and South Africa. When outside powers withdrew their funding in the late 1980s and early 1990s, each side turned to the nation’s natural resources primarily oil and diamonds to fund its armies. By the time UNITA and the government signed a cease-fire in April 2002, at least 500,000 had been killed and 33% (one-third) of the population was displaced” (Ross, 2002).

Others say that between 1975 and 1991, 900,000 died - 90,000 killed or injured by mines and 1.7 million displaced out of a population of 12 million (Ostheimer 2000 *In:* Cilliers & Dietrich, 2000). The fundamental cause of the civil war in Angola is the division of power and wealth along ethnic lines (Malaquias, 2000 *In:* Cilliers & Dietrich, 2000).

Oil Revenue

Oil revenues in Angola are expected to increase to US\$ 12 billion annually by 2005 (Clarke, 2000 *In:* Cilliers & Dietrich, 2000). About 70% of Angola’s 1998 oil production of 760,000 barrels a day (see Figure 13.4: Oil production in Africa) was exported to the USA, providing the MPLA with 60% of its total revenue (Reno, 2000 *In:* Cilliers & Dietrich, 2000). The production of 770,000 barrels of oil a day accounts for 90% of the country’s exports, 80% of government revenues and over 40% of Gross Domestic Product (GDP) (see Table 13.2: Economic dependence on oil by key African exporters, 2002). It is expected to reach one million bpd in the near future. Angola is the sixth largest supplier of crude oil to the United States and is expected to increase from 7% to 10% of crude imports

within the next eight years. Foreign companies, including Chevron, TotalFinaElf, Texaco, BPAmoco, Exxon Mobil, Occidental Petroleum and Royal Dutch Shell, have invested about US\$ 8 billion in Angola (Dietrich, 2000 *In: Cilliers & Dietrich, 2000*). Gary and Karl (2003) estimate

“more than 40% of its oil is exported to the U.S. market, and production is projected to increase to 2 billion bpd by 2008. ChevronTexaco, Angola’s largest oil producer, is currently pumping more than 500,000 bpd, and Total, ExxonMobil and BP are also heavily invested. Like Nigeria, Angola’s oil dependence is legendary — from 1995 to 2001, oil tax revenues comprised 70-90% of state revenues and over 60% of GDP. More than 97% of Angola’s oil is drilled offshore, so there is little interaction between companies and local communities” (see Table 13.2: Economic dependence on oil by key African exporters, 2002).

“Oil revenues and oil-backed loans from foreign banks between the state oil company Sonangol, the palace, and the central bank, create a ‘circuit’ which has funded arms purchases of up to US\$ 1 billion/year” for the Angolan government (de Beer & Gamba, 2000 *In: Cilliers & Dietrich, 2000*).

Most of the money from oil experiences overseas flight by the oil companies or into Swiss bank accounts by the political elite and generals who control the country (LeBillon, 2000 *In: Celliers and Dietrich, 2000*).

“Bilateral actors (e.g., Western donors/governments) are inclined to accommodate domestic anti-reform interests in order to secure commercial benefits, particularly for their Transnational Corporations (TNCs)” (LeBillon, 2000 *In: Celliers and Dietrich, 2000*).

Guest (2004) explains that the civil war in Angola provided an excuse for secrecy in the name of national security, which made it easy to pocket kickbacks from arms deals or to funnel the money directly into offshore accounts of the elite. So why have peace? Though by now, the elite are so rich they can “afford” peace.

Poverty among Plenty

Meanwhile, the state of Angolan poverty is acute, with low and falling incomes, chronic unemployment, massive deficits in health and education, poor infrastructure and high infant mortality (Clarke, 2000 *In: Cilliers & Dietrich, 2000*). About 25% (one in four) of Angola's children die before the age of five and 1 million Internally Displaced Persons (IDPs) remain dependent on international food aid (Global Witness, 2004). Little or nothing goes into development. It could be argued that anarchy and instability, if controlled by the exploiters, maximizes profits. This is good capitalism. As currently practiced, capitalism has no morality other than profit maximization.

Foreign Aid Creates De-Linked Government

A good overview is “Angola’s War Economy, The Role of Oil and Diamonds” (Cilliers & Dietrich, 2000). This book explains that Angola is controlled by big American and French multi-national petroleum concerns and diamond merchants who pay off both sides, such as the French oil company Elf Aquitaine (Le Billon, 2000 *In: Celliers & Dietrich, 2000*); cheaper to pay off the President, a few generals in MPLA, and the UNITA hierarchy than an entire country. Angolan political elite have “de-linked” themselves from the plight of the masses. This de-linkage is fueled by “war aid agencies (NGOs)”, supported by Western donors such as USAID, that provide “government services” through NGOs such as CARE, World Vision and the Catholic Relief Services or the UN sponsored World Food Program (WFP); in essence, public service contractors and, one could argue, instruments of U.S./Western foreign policy, which negate the need for the government to be responsible to its citizens (Ostheimer, 2000 *In: Cilliers & Dietrich, 2000*) (see Chapter 11, Section 11.7, FOREIGN AID IN GENERAL).

One might ask, as in Zimbabwe, does this aid (especially food aid) help prolong the anarchy that exists, allowing investment in war instead of peace? Angola has been transformed from a one-party state to a presidential regime and a few generals (Cilliers, 2000 *In: Cilliers & Dietrich, 2000*) at the expense of its citizens.

Switch-Hitting by the USA

The U.S. political tilt in recent years towards the Marxist MPLA-led dos Santos government and away from Jonas Savimbi's UNITA has many roots and perhaps control of oil interests is one of these elements (Madsen, 1999; Clarke, 2000 *In: Cilliers & Dietrich, 2000*). The CIA plan to kill Savimbi reportedly had backing of U.S. oil interests who wanted to block UNITA's attempt to spread conflict to oil-rich Cabinda, possibly linking up with the Cabindian secessionist movement, Front for the Liberation of the Cabinda Enclave/*Frente de Libertacao do Enclave de Cabinda* (FLEC) (Madsen, 1999).

Joseph Kennedy [son of Robert Kennedy and former U.S. Congressman was the founder of CEII (Boston-based Citizens Energy International)]. His brother Michael ran CEII while Joseph was in Congress and founded the U.S.-Angola Chamber of Commerce that at one time supported UNITA. The Chamber, consisting of major American-based oil companies (e.g., Gulf Oil, Chevron and Texaco) turned against UNITA and pressured President George Bush Sr. to drop his support. Savimbi was on his way out, whether he knew it or not, even after the September 1992 elections when the MPLA and UNITA were forced into power sharing. American oil and mineral interests wanted Savimbi (UNITA) out, which by then supported President William (Bill) Jefferson Clinton's foreign policy of recognizing the MPLA. Joseph's and Robert's uncle, Senator Edward Kennedy, sponsored a Senate bill calling for sanctions against UNITA and on

September 23, 1993, President Clinton signed an Executive Order that the long sustained and CIA-supported UNITA movement was a “continuing and unusual extraordinary threat”. Both Mobutu Sese Seko and Lissouba continued providing Savimbi support until their ouster (Madsen, 1999). Another pawn had expended his usefulness to the Western political-industrial establishment and would soon be eliminated. At the same time, the American-Canadian mining company, American Mineral Fields (AMF), wanted the UNITA guerrillas out of the diamond fields so that it could reap the profits, beating De Beers from South Africa to the punch (Madsen, 1999).

Employment of Private Military Companies/Contractors (PMCs)

The foreign investors, together with non-African officials (e.g., Western governments and their multi-national firms), have a vested interest in ensuring that Angola’s government is secure and stable by helping Angola’s regime gain access to services of other private firms (e.g., Private Military Companies/Contractors (PMCs) (Reno, 2000 *In: Cilliers & Dietrich, 2000*) such as Executive Outcomes (EO),⁵⁴⁶ Saracen, Falconer Systems of South Africa and its British-based sister company Sandline, Saracen, as well as Wackenhut⁵⁴⁷ and MPRI – both U.S. based – (Madsen, 1999) that assist in tasks conventionally associated with states; warfare and diplomacy that help depress internal challengers (e.g., UNITA). Likewise, links between Washington and the International Defense and Security (IDAS),⁵⁴⁸ a private Netherlands Antilles company have been raised, as well as initial financial support by Jean-Raymond Boulle in Angola to cut off supply routes to Jonas Savimbi’s UNITA along the

⁵⁴⁶ Prior to the ouster of Savimbi/UNITA, the principal author, living in South Africa met a mercenary working for Executive Outcomes (EO), guarding the diamond fields for UNITA – both sides using mercenaries.

⁵⁴⁷ The Wackenhut Corporation, 4200 Wackenhut Drive, Palm Beach Gardens, Florida USA 33410-4243, Tel.: 561-622-5656, <http://www.wackenhut.com/>.

⁵⁴⁸ Address not found.

Democratic Republic of Congo's border. Boulle's America Mineral Fields eventually bought IDAS outright (Peleman, 2000 *In:* Musah & Fayemi, 2000).

These foreign Private Military Companies/Contractors (PMCs) provided MPLA with access to channels for foreign aid, export guarantee schemes, loans to foreign investors and diplomatic support for the investment strategies of individual firms. Oil, attracts far greater resources from foreign states, both diplomatically and commercially, than diamond mining (Reno, 2000 *In:* Cilliers & Dietrich, 2000). In some cases, PMCs act as facilitators in arms purchases (LeBillon, 2000 *In:* Cilliers & Dietrich, 2000). Madsen (1999) demonstrates how these PMCs, basically mercenaries legitimized by both Western and African governments, are used throughout the continent by both Western interests (e.g., oil and mining companies, as well as Western governments) and African governments to achieve strategic objectives. This is often related to controlling access to natural resources where official intervention might be considered politically sensitive, especially if the press and/or human rights groups got a hold of such information.

Multinationals Drive Angola's Economy

A handful of major multinationals drive the economy and safeguard the government from military defeat (Dietrich, 2000 *In:* Cilliers & Dietrich, 2000). One of these, Halliburton, has ties that assist the firm to protect its own assets and by extension help the MPLA government to procure military services and intelligence, even if the firm's directors do not play a direct role in these affairs. Brown and Root, an engineering and logistic firm (which provided services to U.S. military forces in Somalia in 1993) is a subsidiary of Halliburton. Richard Cheney, currently Vice President of the United States under George W. Bush and U.S. Secretary of Defense from 1989-1993, until recently was the Chief Executive Officer (CEO) and Chairman of Halliburton. Halliburton, with Export-Import

Bank assistance, controls activities in the Cabinda enclave that is protected by Airscan,⁵⁴⁹ a security firm employing former U.S. military personnel. Amoco, Elf, Exxon, Marathon and Statoil procured financial and technical capabilities to explore for and extract oil in deep-water concessions in joint venture with Sonangol (which holds 20% equity shares). The inclusion of additional firms such as Prodev, Naphta and Falcon Oil raise suspicions that these joint ventures mix oil production with arms purchases (Reno, 2000 *In: Cilliers & Dietrich, 2000*). Oil has literally destroyed the Nigerian economy and corrupted its leadership and Angola seems to be heading in the same direction, with the MPLA mortgaging its future oil production for cash up front, mainly to purchase arms (*Cilliers, 2000 In: Cilliers & Dietrich, 2000*).

The role of “broker” between the Angolan government and international community will yield few results unless multinationals are willing to address human rights, the environment and corruption. Since the MPLA is not transparent, the oil companies operating in Angola must demonstrate complete transparency (*Dietrich, 2000 In: Cilliers & Dietrich, 2000*) (see Section 13.12.1, “Publish What You Pay” an Attempt at Developing Transparency in Distribution of Wealth from Africa’s Natural Resources).

MPLA Largest Arms Supporter in Southern Africa

The MPLA government is the largest arms purchaser in southern Africa, spending an estimated US\$ 5 billion on weapon imports during 1993 and 1994. Because arms procurement strategies are hindered by Angola’s US\$ 12 billion external debt, the MPLA instead uses oil revenue gained through taxes, signature bonuses, royalties and payments to the national oil company, Sonangol, not being open to

⁵⁴⁹ AirScan Inc., 7017 Challenger Avenue, Titusville, Florida 32780, Tel: 321-268-9922, Fax: 321-256-9018, email: info@airscan.com and website: <http://www.airscan.com/>.

outside scrutiny, to buy arms or lubricate corrupt procurement mechanisms (Dietrich, 2000 *In: Cilliers & Dietrich, 2000*).

While most arms are flown in from Eastern European suppliers, not all stop in Angola. Weapons flow out of Angola into northern Namibia and Zambia. The symbiosis between the conflict in Angola and that in the Democratic Republic of Congo, Rwanda, Uganda, northern Namibia and western Zambia is such that the movement of small arms, ammunition and other commodities are exchanged for resources such as diamonds, endangered species and rare woods. These movements are facilitated by the existence of increasingly well-organized transnational criminal organizations (de Beer & Gamba, 2000 *In: Cilliers & Dietrich, 2000*).

Blood Diamonds and UNITA

“Diamonds had made UNITA so rich that nothing that donors could offer would matter, while renewed predation offered massive rewards” (Reno, 2000 *In: Cilliers & Dietrich, 2000*).

De Beers in the past bought Angolan diamonds supplied by UNITA. Under criticism from Global Witness, De Beers announcement on 5 October 1999, that it would stop buying all Angolan diamonds, except those it was contractually obliged to purchase and has recently announced it would issue written guarantees that its diamonds did not originate from African rebels, that its stones are ‘rebel free.’ (Dietrich, 2000 *In: Cilliers & Dietrich, 2000*).

Now that Savimbi, the opposition leader cum guerrilla fighter, is dead (some say taken out by paid mercenaries on February 22, 2002) (*Africa Confidential, 2002b*), it will be interesting to see if the war ends, if others will pick up where Savimbi left off and how the wealth of Angola will be used in the future – to buy

implements of war, or to arm its people with education – something that the ruling elite may fear more than an AK-47, since this could lead to demand for accountability by its citizenry.

Corruption Continues in Post-Savimbi Era

Corruption continues. Global Witness (2004), says new evidence from IMF documents and elsewhere confirms previous allegations that over US\$ 1 billion per year of the country's oil revenues - about a quarter of the state's yearly income - has gone unaccounted for since 1996. Fletcher (2003) estimates that

“80–90% of Angolan government revenues come from the oil industry, but up to 40% of gross domestic product (GDP) in some years has bypassed the treasury and is channeled into hidden funds...Angola’s oil revenue accounts have been rendered even more opaque by the practice of paying for foreign bank loans with future oil cargoes, which has allowed for the diversion of state funds to irregular ends”.

“Oil firms plan to invest \$US 23 billion in Angola over the next 5 years, so this area is potentially a vast ‘black box’ in which oil service companies are only supervised by host governments and oil companies collaboration in hiding revenue flows in this arena is highly likely” (Transparency International, 2004).

Political and business elites in France, Angola and elsewhere exploited the country's civil war to siphon off oil revenues. There is evidence from a Swiss investigation of millions of dollars being paid to President dos Santos. The dos Santos government continues to seek oil-backed loans at high rates of interest, financed through opaque and unaccountable offshore structures. A major concern exists that Angola's elite will switch from wartime looting of state assets to profiteering from its reconstruction (Global Witness, 2004).

Corporate Responsibility

“Multinationals have a significant role to play in ushering in the changes that have been long overdue. The multinationals must be committed partners. Should they fail as corporate citizens, and foreign governments fail to broker peace and prosperity, it will be up to the consumers and the broader civil society to raise awareness and enforce accountability” (Dietrich, 2000 *In: Cilliers & Dietrich, 2000*).

However, to date the multi-nationals have refused to “Publish What You Pay” because of threats by the Angolan government to cut future multi-billion dollar contracts (Fletcher, 2003) (see Section 13.12.1, “Publish What You Pay” an Attempt at Developing Transparency in Distribution of Wealth from Africa’s Natural Resources).

Impacts of Angolan War on Wildlife

The status of large mammals in Angola’s protected areas declined by 90% during the 1970s and 1980s (Anstey, *pers. comm. In: Koch, 2004*; Huntley & Matos, 1992 *In: Koch, 2004* both *In: Fabricius, Koch, Magome & Turner, 2004*). Recent research indicates that remnant populations of the giant sable (*Hippotragus niger variani*) exist in central Angola that if protected could build up to viable herds.

13.10.1.6 Oil-scorched earth Sudan

“Our country is poor and in need of economic development. However, oil is not contributing to the development. We witness this displacement of our flocks from their homelands, driven away by helicopter gunships, Antonov bombers and government troops and militias in order for oil companies to work in relative security. Private companies, like any other organ in the society, are obliged to abide by and promote respect for the principles of the Universal Declaration of Human Rights”. (Catholic Bishops of Sudan, 2001 *In: Gary & Karl, 2003*).

Sudan has proven oil reserves of over one billion barrels and prospects of an additional 1- 4 billion barrels (Danforth, 2002).

“The exploitation of long-known oil reserves in Sudan has only added to fuel to the fire of the country’s long running civil war. Over 2 million have died and 4 million have been displaced during the last 20 years of the war...Sudan earned over \$300 million from oil in 2000 and greater sums still in 2001 and 2002. Government take in certain blocks is as high as 80%. Over the next 20 years, the PFC Energy consulting firm estimates that the Sudanese government may receive up to \$30 billion in revenues” (Gary & Karl, 2003).

Between 2004 and 2012, Sudan could collect as much as US\$ 30 billion in oil revenue with the potential for much more if exploration succeeds (Goodman, 2004).

Ethnicity and Religion

Northern Sudan is predominantly Muslim and the south is predominantly Christian. The Muslims make up 85% of the country’s population, with the remainder being Christian, Animist, Hindu and Jewish. Islam is not necessarily connected with the Arabic language. According to a 1955/56 census, the Sudanese ethnic composition was a 39% mix of Semitic migrants and indigenous Negroid Arabs, 36% Nilo Hamitic and Sudanese Negroid, 6% indigenous Negroid with some Semitic and Hamitic elements (Nuba and Nubians) and the rest are indigenous Negroid Funj (1.7%) and West African migrants (7%). In Sudan there are 132 tribes and sub-tribe groups. While people of African origin dominate the south, western and eastern Sudan, those of Arab origin are in the north and the mixed tribes are in the center (Sin & Takana, 2002).

Historical Reasons for Conflict

There are historical reasons for the war that are political, cultural, military and religious, dating back to foreign interference of 1821 when Mohamed Ali from Egypt moved southwards to Sudan and after that, the British conquest of Sudan.

Much of the blame for Sudan's current problems, in addition to the struggle for control of natural resources, can be attributed to British "divide and rule policies". Britain's anti-Islamic policies resulted in a separation of the Islamic north from the animist and what was to become Christian south. Britain saw a Christian south as a buffer to the rest of its colonies (e.g., Kenya and Uganda) against the spread of Islam. American and British missionary schools were established in the south. The south was declared a "closed district" by the British to northern Sudanese, while Christian, Greek and Syrian merchants were welcomed. The southerners called the northern Arabs non-Sudanese, while the northerners called the southerners, *Abid* or slave. After half a century, by the mid-20th century, in one country there existed two mutually antagonistic nations divided by language, religion and ethnicity, with these animosities of the 19th century encouraged to fester not heal (Harden, 1991). When the British left, the problem had already started. Since 1953, these differences were not corrected by previous Sudanese governments. Fighting between the north and the south began even before independence in 1956 (Harden, 1991), continuing almost uninterrupted until 2003, while peace negotiations continued.

The South requested the implementation of a federal system of government that was considered a taboo – separation. The thinking of the rulers in Sudan was to create a homogeneous Sudan, in which two twin policies were advocated: 1) Arabization and 2) Islamization. This did not succeed. The south requested self-rule, which was implemented from 1972 to 1983, at a time when there was

relative peace in the country, but then it was destroyed by the very ruler who brought it about (Executive Intelligence Review, 1998).

Gaafar Numeiri, who took over in a military coup in 1969, was initially supported by the U.S. with US\$ 1.5 billion in aid despite his repression as a counter-weight to pro-Soviet Gaddafi of Libya and Mengistu of Ethiopia. In 1983, he declared an Islamic revolution, throwing the country once again into civil war (Meredith, 2004).

Conflict

Conflict has consumed the country for 34 of its 45 years of independence and remains the only constant factor in this sprawling country of 36 million people covering a territory about the size of Western Europe, especially since the civil war resumed in 1983, rivaling that of any seen since World War II. An estimated two million people have died as a result of the fighting over the past 18 years, victims of direct violence or related starvation and disease. Half a million refugees have spilled into neighboring countries and roughly four million people have been displaced and driven from their homes within Sudan – the largest such dislocation in the world today (ICG, 2002; Goodman, 2004).

The main warring parties – the Islamist government and the opposition Sudan People's Liberation Army (SPLA) – have shown little interest in a serious peace process until recently. The government has pursued a “divide and conquer” strategy through intensive efforts to sow conflict among southerners (ICG, 2002).

U.S. and IFIs Involvement in Conflict

“Uganda provides a good example. Uganda is at war on three fronts and a significant percentage of the IMF/WB funding which has gone into Uganda has been diverted for military objectives. The banks, which fund Uganda through the international monetary institutions, are often associated with the multinationals involved in the plunder of raw materials. Uganda has supported the Sudan People’s Liberation Army (SPLA) war in southern Sudan, and I took testimony from Uganda dissidents who insist that U.S. military advisors have worked with the SPLA and Ugandan People’s Defense Forces (UPDF) against Khartoum” (Snow, 2001 *In: McKinney, 2001*).

Madsen places the U.S. plan to overthrow the Khartoum government as 1994 under the Clinton administration, when Eritrea, Ethiopia and Uganda began supplying Sudan’s rebels with arms, bases and logistical support, with the U.S. supplying US\$ 20 million in “non-lethal” military aid (Madsen, 1999). Madsen (1999) speculates that USAID, with strong ties to the CIA/Intelligence community, used the old CIA Airline, Southern Air, to funnel both arms and food aid to the SPLA through Western NGOs (see case study, Chapter 11, Section 11.8.6, Food Aid and NGOs in Sudan). This continued in 1998 with the bombing of the Al Shifa pharmaceutical plant in Khartoum by the U.S. because of its alleged production of VX nerve gas and supposed terrorist links to Osama bin Laden, neither of which has been proven. This came at a time when Khartoum was supporting the Democratic Republic of Congo’s Laurent Kabil, which America had decided to depose (after putting him in power with Ugandan/Rwandan and Tutsi-led Congolese troops), while the U.S. backed the SPLA, along with Khartoum peace talks that had collapsed (Madsen, 1999).

John Garang, with a PhD⁵⁵⁰ in agricultural economics from the Iowa State University, also received military training at Fort Benning, Georgia (Meredith, 2004; Thibodeaux, 2005), as U.S. allegiances changed from the north to the south.

A small window for peace opened because of the shock effect of the 11 September (2001) terror attacks in the United States (U.S.) and their impact on policy debates within the Khartoum government (a difficult economic situation), as well as the increasing desire of the Khartoum authorities to escape international isolation and enjoy their new oil wealth. The U.S. Government, by appointing distinguished former Senator John Danforth as Special Envoy, showed some willingness to become more engaged (ICG, 2002).

Oil Reserves Reshape Sudan's Civil War

The discovery of oil reserves in the south and serious production in 1999 reshaped Sudan's civil war. The Sudan People's Liberation Movement (SPLM), supported by the Sudan People's Liberation Army (SPLA), regards oil as a southern endowment that the government has forcibly exploited to finance a war strategy that relies increasingly on expensive, highly lethal weapons. The reconciliation between SPLA/SPLM rebel leaders John Garang (Dinka ethnic group) and Riek Machar (Nuer ethnic group) (in 2007, Vice President of Southern Sudan) was seen by the Sudanese government as a serious Nuer-Dinka threat to oil fields, justifying a military response, including attacks on civilians. Any peace process needed to address the oil issue in order to resolve a major cause of conflict and to serve as the basis for a just peace (Danforth, 2002).

In the oilfields of Sudan, civilians have been killed and raped, their villages burnt to the ground; caught in a war for oil, part of the wider civil war between northern and southern Sudan that has been waged for decades (Christian Aid, 2001).

⁵⁵⁰ Received a bachelor's degree in economics from Grinnell College, Iowa (Grinnell College, 2003).

A network of Western and Asian companies provides the critical expertise, finance and technology for Sudan's oil industry. Talisman Energy (Canada), Petronas (Malaysia), China National Petroleum Company (CNPC) (see Section 13.8.5, China in the Back Door), Lundin (Sweden) and OMV (Austria) have built production and refining facilities and financed the building of the 1,600 km pipeline taking petroleum from the oil fields to the Red Sea. Royal Dutch Shell built a refinery at Port Sudan. Chinese companies built the pipeline using materials that were supplied by the European company, Europipe, owned by Mannesmann (Germany), British Steel (now Corus) and a French company. Pumps of Glasgow and Allen Power of Bedford were awarded the contract to produce pumps and drivers in January 1998. Rolls Royce provides diesel engines and expatriate engineers to maintain them. The governments of Canada, China, Malaysia, Austria, France, Qatar and Sweden have companies (state owned and private) directly involved in Sudan. U.S. sanctions prohibit trade between the U.S. and Sudan, as well as investment by U.S. businesses in Sudan (though apparently not clandestine military arms and support), due to the Sudanese government's alleged sponsorship of terrorism and poor human rights record (Christian Aid, 2001). Due to public pressure, Talisman has pulled out (Goodman, 2004).

The presence of international oil companies is fueling the war. In the name of oil, government forces and government-supported militias are emptying the land of civilians, killing and displacing hundreds of thousands of southern Sudanese using oil industry infrastructure – the same roads and airstrips that serve the companies. In retaliation, opposition forces have attacked government-controlled towns and villages, causing further death and displacement. The Sudanese government itself now admits that oil is funding the wider civil war. A report by Washington-based Center for Strategic and Investment Studies concludes that: "Oil is fundamentally changing Sudan's war" and calls for the U.S. to enlist the

support of the UK government in an effort to end the war. The oil companies remain largely silent (Christian Aid, 2001).

Sudan, which two years ago was an oil importer, is now an exporter of oil and, with oil money, is able to fund an expansion of the war (Christian Aid, 2001). Of the US\$ 500 million received in oil revenue by Sudan in 1999, 80% went to buy weapons (Goodman, 2004), while from 1998-2002 the military budget doubled (Christian Aid, 2001; Goodman, 2004). China has established three weapons factories around Khartoum and is Sudan's largest supplier of arms (Goodman, 2004). This is alluded to in the description of a new industrial complex in the north that is reported to be used for dual civilian-military use (Christian Aid, 2001). Companies such as Lundin, Petronas and CNPC have contributed to the extension of the war by permitting government forces to clear new areas for them to exploit. The offensive, which will be necessary to take control of TotalFinaElf's concessions, will take the scorched earth close to the borders of Uganda and Kenya (Christian Aid, 2001), mostly of the Nuer and Dinka tribes, creating a *cordon sanitaire* around oil fields unless a peace treaty is signed.

Peace on the Horizon?

The broad strokes of a peace deal could potentially include the following fundamental compromises (ICG, 2002):

- “A federal constitution neither based on religion nor labeled secular, with each regional entity or state able to craft its own laws;
- A symmetrical federalism (with a higher degree of autonomy for the south) during an interim period, backed by credible international guarantees, with mutually agreed bench marks that if not met would trigger a self-determination referendum for the south and;
- An internationally monitored mechanism for wealth sharing that ensures that all sides benefit from implementation”.

A peace agreement was signed on May 26, 2004 in Naivasha, Kenya between the SPLA and the government of Sudan, through the Inter-Governmental Authority on Development (IGAD), an intergovernmental body of east African countries in an attempt to bring peace to this prolonged war. Even if the SPLA and northern Sudanese government come to terms, civil unrest is far from over as other rebel groups that are not involved in the peace talks appear on the horizon in the Darfur region, an area the size of France with an estimated four million people and a 1,000 km border with Chad (Human Rights Watch, 2004b). In a September 2004 interview, Garang (Bowman, 2004) explained that only the successful implementation of a comprehensive peace agreement will solve Sudan's woes, including the problems in Darfur (see Chapter 5, Section 5.11.4, Darfur, Sudan, overpopulation, desertification, ethnicity, conflict and politics).

Talks between the SPLM and the Sudanese government have yielded a basic framework for a power-sharing agreement, but issues remain to be settled and the talks are on hold. Until the accord is finalized and put into practice, Sudan's troubles will continue. Garang believes

“ ‘the solution is to have a new government in Khartoum. It is this government of national unity that will have the correct frame of mind and the necessary political and moral will and capacity to address the issue of Darfur’ ” (Bowman, 2004).

This occurred in July 2005 as John Garang was sworn in as Sudan's first Vice-President, signing an interim constitution for the next six years, ending 22 years of war that killed two million people and displaced four million more. After six years, a referendum will be held allowing the south to determine if it wishes to continue as part of the Sudan government. Hurdles still to be covered include (Majtenyi, 2005):

- Formation of a cabinet;
- Disbanding of southern militias; and
- Dealing with the Darfur crisis in western Sudan (see Chapter 5, Section 5.11.4, Darfur, Sudan, overpopulation, desertification, ethnicity, conflict and politics).

On Saturday, July 30, 2005, John Garang died in a helicopter crash returning from a visit to President Museveni in Uganda. Although deputy SPLA chairman Salva Kiir Mayardit, vowed to continue with the peace initiative (Thibodeaux, 2005), an already fragile peace has become even more fragile with the loss of this charismatic and visionary leader. U.S. Congress is concerned that a failure to find a solution to the Darfur conflict could result in an unraveling of the peace between the north and the south, while implementation of the Comprehensive Peace Agreement (CPA) between the north and the south, signed in 2005, is critical to ending the violence in Darfur (Robinson, 2005). Meanwhile, on May 5th 2006, a fragile peace agreement was signed between the main Darfur rebel group Sudan Liberation Movement/Army (SLM/A) and the Sudanese government. However, rival factional leader Abdel Wahid Mohammed al-Nur and another rebel group, Justice and Equality Movement (JEM), refused to sign leading the International Crisis Group (ICG) to conclude that there will be no peace in Darfur (Sudan Tribune, 2006b). He has also refused to attend the planned peace talks late 2007 peace talks in Libya (see Chapter 5, Section 5.11.4, Darfur, Sudan, overpopulation, desertification, ethnicity, conflict and politics). The fact is such treaties are short-term quick fix “feel good” actions that do nothing to mitigate the low resource to human population ratios, especially land, water and grazing. Unless Sub-Saharan Africa is helped to modernize, meaning urbanizing and industrializing to the point that significant human pressures are taken off the rural base, the genocides of Darfur and Rwanda and the conflicts and civil wars seen in places like the eastern DRC, central Nigeria, the Niger Delta, Kenya and the Ivory

Coast are just the beginning and indicative of what the future holds for the subcontinent.

The United States remains willing to celebrate a final north-south peace deal with a White House ceremony and to move to full political relations with Sudan. However, the U.S. still maintains economic sanctions because of Sudan's continued listing by the U.S. State Department as a state sponsor of terrorism, though cooperation in this matter has improved since 2001 (Gollust, 2004). U.S. Congress wants no normalizing of relations with Sudan until the Darfur conflict is resolved and are concerned about the upgrading of Sudan's rating in U.S. report on human trafficking (Robinson, 2005).

Meanwhile, as Darfur drags on with no obvious solution in sight (see Chapter 5, Section 5.11.4, Darfur, Sudan, over-population, desertification, ethnicity, conflict and politics), the Sudan People's Liberation Army (SPLA) accused the ruling National Congress Party of Sudan of violating the Comprehensive Peace Agreement (CPA) by maintaining huge forces in Southern Sudan, oil revenue, failing to restructure the civil service so that it is apolitical, and failing to reform draconian laws that suppress freedom of speech and the press. Although part of a government of national unity, in which Southern Sudan has 28 percent of the power; the National Congress retains 52 percent, and other parties 22 percent, Southern Sudan is negotiating bilateral agreements with the U.S. to drop sanctions against the South, while maintaining them against the north (Butty, 2007b; VOA, 2007). In mid-October 2007, the The Sudan People's Liberation Movement (SPLM) appeared to pull out of the unity government stating that its 18 ministers in central government would not report to work until the above issues are resolved (VOA, 2007). Peace between north and south, as well as Darfur is far from being achieved, and fragile at best.

Peace, if it comes, will be a mixed blessing depending on the stakeholder. China will have to compete with more Western oil companies and the SPLA, whose rebel held territories contain 40% of known oil reserves worth more than US\$ 16 billion, say they will seek to punish China for its support of the Khartoum government (Goodman, 2004).

13.10.2 Conflict Diamonds in Africa

Diamonds are an important portion of the GDP for a number of Sub-Saharan African countries (Table 13. 3). The United Nations brokered the “Kimberley Process” diamond certificate program to stop the illegal trade in rough “conflict diamonds”. Conflict diamonds have been primarily associated with Angola, the Democratic Republic of Congo, Liberia and Sierra Leone, where warring groups have funded their battles with proceeds from diamond sales.

Table 13.3: Economic importance of diamond trade to major African producers

COUNTRY	VALUE % GDP
Countries With Alluvial Diamond Mining	
Angola	8.4
Central African Republic	7.4
Guinea-Conakry	3.3
Sierra Leone	13.7
Countries With Primarily Deep Mining	
Botswana	40.1
Namibia	12.0
South Africa	0.9
Source: GAO (2002) with permission, U.S. Government Accountability Office (GAO) and GAO (2002) In: Sparshott (2003)	

Diamond trade is being more and more associated with terrorist groups (Sparshott, 2003) like *al-Qaeda*. The illicit conflict diamond trade is estimated to be about 3% (US\$ 237 million) (Sparshott, 2003) to 3-15% (US\$ 237 million-1.2 billion) (GAO, 2002) of a rough-cut-diamond trade that was valued at US\$ 7.9

billion in 2000 (Table 13.4) (Sparshott, 2003). The estimate of the illicit diamond trade is based on historical production capacities for rebel-held areas, mostly in Sub-Saharan Africa, but which some dispute, believing these figures to include smuggled diamonds from non-conflict areas (GAO, 2002).

Table 13.4: Rough diamonds mining 2000

COMPANY	LOCATION MINES	OF	VALUE OF MINED DIAMONDS (US\$ 1,000s)	PERCENT OF WORLD SUPPLY
De Beers	Botswana, South Africa, Tanzania	Namibia,	3,541,720	45
Airosa Ltd.	Russia		1,595,000	20
BHP Billion	Canada		453, 555	6
Rio Tinto	Australia		360,600	5
Other	Africa, China, Latin America		1,906,120	24
Total			7,856,995	100

Source: GAO⁵⁵¹ (2002), with permission, U.S. Government Accountability Office (GAO) and GAO (2002) In: Sparshott (2003).

“The United States enacted the Clean Diamond Trade Act (The Act, Public Law 108-19) on April 25, 2003, which was initiated by Congress in response to the use of diamonds in fueling conflict and human rights violations in parts of Africa. The Act bans the importation of rough diamonds from any non-participant in the Kimberley Process Certification Scheme (KPCS). Presidential Executive Order 13312, effective July 30, 2003, amends prior Orders on the subject to reflect provisions of The Act, bans all rough diamond imports from Liberia, even if they originated elsewhere, and removes the prior ban on all rough diamond imports from Sierra Leone that are controlled through the KPCS” (USITC, 2003).

The new program requires a certificate to accompany each shipment of “rough diamonds”. It does not apply to cut diamonds. Individual countries are responsible for establishing internal controls, such as licensing diamond mines and generating the certificates. While credited by human rights groups as a positive step, the plan relies heavily on voluntary participation, industry self-

⁵⁵¹ U.S. General Accounting Office.

regulation and occasionally inadequate controls along the supply line. “ ‘I applaud the Kimberley Process. My question is how effective will it be...’ ” said Timothy Docking, an African affairs specialist at the U.S. Institute for Peace, a non-partisan institution funded by U.S. Congress (*In: Sparshott, 2003*).

Without an international certification system, conflict diamonds shipped to an intermediary country can be mixed into otherwise legal shipments (Cilliers, 2000 *In: Celliers & Dietrich, 2000; Sparshott, 2003*), said a report by the U.S. General Accounting Office (GAO, 2002) in disagreement with the Bush administration. In the U.S., a bill with tighter controls is being pushed by Senator Richard J. Durbin, a Democrat (Sparshott, 2003).

Another major problem is that, although deep mining is very expensive and only four major companies control diamonds coming from these sources, across Sub-Saharan Africa shallow alluvial diamond fields exploited by artisanal miners makes controlling the trade and movement of rough diamonds (Figure 13.5) extremely difficult (GAO, 2002).⁵⁵² In 2002

“conflict diamonds are associated with four countries—Angola, Democratic Republic of Congo, Liberia, and Sierra Leone. Rough diamond imports from Angola and Sierra Leone not bearing the official government certificate of origin as well as all rough diamonds from Liberia are banned from the United States” (GAO, 2002).

⁵⁵² Alluvial diamond mining is common in Angola, Zimbabwe, the DRC, CAR, Guinea, Liberia, Sierra Leone, Ivory Coast & Ghana in Sub-Saharan Africa (GAO, 2002).



Source: GAO (2002) with permission U.S. Government Accountability Office (GAO) + public domain.

Figure 13.5: World supply of rough diamonds

13.10.2.1 Sierra Leone, war and diamonds

Kandeh (2002 *In: Zack-Williams, et al., 2002*) describes the role of the state in Sierra Leone as a form of predatory expropriation or instrumentalisation in which political power and position within the state is converted into private economic wealth. This could be said to be the general status quo throughout the subcontinent in those countries with rich natural resources. In the case of Sierra Leone, this began in 1968, “a kleptocracy” whose main objective was to loot the land. In partnership with European and Lebanese financiers, Siaka Stevens (President from 1968-85) and his coterie engorged themselves on the country’s vast natural resources, while the rest of the nation slid to the bottom of the UN charts rating human misery around the world (Rubin, 1997 *In: Kandeh, 2002 In: Zack-Williams, et al., 2002*). Chua (2003) refers to this as “crony capitalism” in which Stevens created a shadow alliance between himself and five economically powerful, but politically vulnerable Lebanese diamond dealers, resulting in a handful of “outsiders” siphoning off the wealth of the nation at the expense of the country’s development and to the frustration of the impoverished masses who remained poor. For years, a 70% illiterate provincial population had seen its diamond mines generating tremendous wealth for a handful of cronies and corrupt politicians. This is another example of an indigenous leader suppressing democracy, while going into cahoots with a market-dominant minority (e.g., Lebanese in Sierra Leone, Moi with Indians in Kenya, Kaunda and Chiluba with Indians in Zambia), with the potential for chaos to ensue (see Chapter 9, Section 9.6.2.2, ADMADE, Zambia and Section 9.8.5.1, ADMADE).

“The civil war in Sierra Leone began in 1991 gradually subsided in 2001, following the 1999 Lomé peace agreement and the incarceration of Foday Sankoh, the leader of the Revolutionary United Front (RUF). The sale of booty futures helped finance RUF’s initial incursion into Sierra Leone, and twice helped prolong the war by saving the government from defeat. Over its

10-year duration, the war produced between 20,000 and 50,000 deaths and displaced at least 33% (one-third) of the population. Sierra Leone's civil war commenced in March 1991 when a handful of fighters associated with RUF first crossed the border from Liberia. The Liberian leader, Charles Taylor, helped organize and support the invasion; indeed, soldiers from Taylor's army made up part of the RUF incursion" (Ross, 2002).

RUF extorted diamonds from the mining companies, earning as much as US\$ 100 million/year, as well as expropriated wealth from titanium and bauxite mines that produced 57% of Sierra Leone's exports (Madsen, 1999).

Many of the RUF had been trained in Libya, coming from a disenfranchised working class youth hooked on drugs, alcohol and street gambling, with a limited education (Bangura, 1997 *In:* Kandeh, 2002 *In:* Zack-Williams, *et al.*, 2002; Musah, 2000 *In:* Musah & Fayemi, 2000). They were hungry, disaffected and angry. They were easy to recruit, Sankoh promising them (where the state had failed) jobs, free education and a mission (Chua, 2003). Non-delivery of public services by the state had a devastating impact on the youth in the 1980s and 1990s, especially in the area of education. As the school dropout rate increased, criminal behavior and banditry increased, defining the youth's response to this hopelessness. The IMF's conditionality requiring the government to terminate subsidies on basic commodities, deregulate the economy, devalue the currency and reduce government spending contributed to this hopelessness and poverty (Kandeh, 2002 *In:* Zack-Williams, *et al.*, 2002; Chua, 2003). Rice prices rose 180% and oil 300%, resulting in conditions ripe for anarchy (Chua, 2003). Kandeh (2002 *In:* Zack-Williams, *et al.*, 2002) argues that economic mismanagement and the looting of public resources provides windfalls for the political elite, but is disastrous for the masses because it undermines state effectiveness and invites IMF wardship. This in turn contributes to the

“lumpensation”⁵⁵³ of significant elements of society. In turn, he argues that the “sobelisation of the army” (that is the transformation of the army into brigands and armed robbers) can be traced to the “lumpen” background of recruits. For local people, the RUF and the army became indistinguishable, as they both committed similar atrocities.

Links between *Al-Qaeda* and Diamonds (“Conflict Diamonds”) in Sierra Leone and Liberia

A recent study by the European intelligence committee shows strong links between Charles Taylor, RUF diamonds and the movement of money by the fundamentalist Muslim al-Qaeda terrorist network (Farah, 2002; 2006). The al-Qaeda network has cornered the diamond market from both Liberia and Sierra Leone, buying up to US\$ 20 million of diamonds. This is believed to have been initiated as a result of a move by the United States to freeze al-Qaeda assets, after the 1998 attacks on U.S. Embassies in Kenya and Tanzania were linked to this organization. Diamonds are small, easily movable and can be traded for arms and their instruments of terrorism. Taylor has also been linked to the illegal arms trade. Support has also been given in housing al-Qaeda operatives by both Liberia and Burkina Faso (Farah, 2002).

Role of PMCs in Sierra Leone’s Civil War

During the war in Sierra Leone, the government was saved from defeat twice by selling off booty futures. In March 1995, RUF had taken control of the country’s main diamond fields and advanced to within 32 km (20 miles) of the capital (Madsen, 1999; Ross, 2002).

⁵⁵³ Of or related to dispossessed and uprooted individuals cut off from the economic and social class with which they might normally be identified.

The government offered future mining rights to the Kono diamond fields (in rebel hands) to Branch Energy, a South African company, in exchange for the services of a South African mercenary firm, Executive Outcomes (EO) (Madsen, 1999; Ross, 2002). By the end of 1995, Executive Outcomes had captured the Kono diamond fields, turned them over to its affiliate Branch Energy and put RUF on the defensive. The Ohio-based Sierra Rutile and Rex Diamonds, trading on the Toronto Stock Exchange, also used Executive Outcomes to protect their interests. Executive Outcomes used black Angolan and Namibian veterans from the famous South African 32 Battalion that fought in the Angolan war, two of South Africa's most decorated air force pilots and local "Kammah Joes (Kamajors)" who used "gris gris" to protect them from harm, and possibly British SAS (Special Air Service) commandos and U.S. military trainers (Madsen, 1999).

In May 1997, the government of President Ahmad Tejan Kabbah, democratically elected in 1996, was overthrown by a group of junior military officers and was forced into exile (Ross, 2002). This was after Kabbah terminated Executive Outcomes (EO)'s contract under pressure from the IMF and was warned by EO, 'in 90 days you will fall.' The coup leader, Major Johnny Paul Koromah was a graduate of Britain's Sandhurst Military Academy and many of his men were trained by Executive Outcomes (Madsen, 1999).

Musah (2002 *In:* Musah; Fayemi, 2000) argues that the British government wanted to return Tejan Kabbah to power after having been deposed by Major Johnny Paul Koromah and his AFRC junta/RUF⁵⁵⁴ rebel coalition, but at minimum cost and indirect involvement. The London-based PMC Sandline effectively served in Sierra Leone as the British government's forces and intelligence network. They also did not want Nigeria, who made up the majority of the Economic Community of West African States (ECOWAS) Monitoring

⁵⁵⁴ Armed Forces Revolutionary Council (AFRC) junta of Major Johnny Paul Koromah /Revolutionary United Front (RUF) rebels.

Group (ECOMOG) peace keeping forces, to take full credit for returning Kabbah to power, being concerned: 1) For Nigeria's appalling internal human rights record, repression and banditry, 2) With the world slump in oil prices, an attempt by Nigeria to get their hands on Sierra Leone's diamonds and 3) For Nigeria's West African foreign policy of a pattern of concentric circles, the epicenter being Nigeria's national political and economic interests and thus, hegemony over the region. The Nigerian government, by keeping the majority of its 10,000 military personnel occupied outside Nigeria, minimized the chance for an internal military coup.

Over the next three months, Kabbah was approached by a series of businessmen who offered to purchase future diamond concessions; the proceeds, in turn, could finance a counteroffensive that would bring Kabbah back to power. In December 1997, Kabbah sold diamond futures to Saxena (a PMC) and hired the services of Sandline (a PMC). Over the next three months, Sandline and Nigerian forces (who were operating under the authority of the Economic Community of West African States (ECOWAS) launched a military offense that forced the junta from power, returning Kabbah to power in March 1998 (Madsen, 1999; Ross, 2002). In 2002, Kabbah signed an agreement with rebel groups officially ending the decade long civil war that killed tens of thousands, was re-elected to second five-year term, and then stepped down after being defeated in September 2007 by opposition leader Ernest Koroma (Barber, 2007b).

Role of Traditional Hunting Guilds in Sierra Leone's Civil War

Included in this effort were the Kamajors, a traditional hunting society of the Mende ethic group, who were transformed by Kabbah into a private 20,000 member standing army with the replacement of traditional hunting rifles with modern equipment such as AK-47's. The traditional commander of the

Kamajors, Chief Sam Hinga-Norman, was appointed Deputy Defense Minister, while the other traditional hunting societies/militias, such as the Tamaboro and Kapra, belonging to other ethic groups, were disbanded (Musah, 2000 *In: Musah & Fayemi, 2000*). Similarly, many of the northern rebels in the Ivory Coast civil war today are members of Dozo guilds, traditional hunter/soldiers dating back to the Malian Empire (see Chapter 2, Section, 2.1.6, Hunting Guilds as a Means of Controlling Access to Wildlife and Chapter 5, Section, 5.7.4.4, Land reform and civil war in the Ivory Coast and Chapter 9, Section 9.8.9.1, Management of Comé-Leraba Game Reserve, Southern Burkina Faso), while in Guinea-Conakry Dozo are managing buffer zones in the *Parc National du Haut Niger* and providing the *de facto* army for the government in power (Fairhead & Leach, 2003).

Role of Superpowers in Sierra Leone's Civil War

Madsen (1999) provides evidence that covert operations were planned in collaboration with high level members of the British Foreign Office and Intelligence, The U.S. State Department and the Pentagon, the private sector and mercenaries.

Once again, France was also involved behind the scene, assisting the National Patriotic Front of Liberia (NPFL) allied to Charles Taylor and to Sankoh's RUF in anticipation of drawing Liberia and Sierra Leone into the West African franc zone as a means of obtaining unhindered access to diamonds and other minerals. This support was provided directly and indirectly through the proxies of the Ivory Coast and Burkina Faso. France was implicated in Taylor's toppling of pro-U.S. leader Samuel Doe. Eventually, Taylor switched allegiance to the Americans, including President's Jimmy Carter and Bill Clinton, as well as Jesse Jackson, Clinton's special envoy for the Promotion of Democracy in Africa – fitting the

mold of the U.S. supporting rebel leaders who shoot their way into power and then create pseudo democracies in which they are the dictator. Perhaps Jackson's position would have better been called envoy for the "Promotion of Hypocrisy" (Madsen, 1999).

By 2005, it is being claimed that certification of rough diamonds as part of the Kimberly process has stopped the illegal sale of "blood diamonds" used to fuel war in Sierra Leone and the region. The biggest challenge today is to assure that the many diamond diggers are paid a fair wage by middlemen. Diamond digger cooperatives are being formed to educate and negotiate fair prices (Menezes, 2005a).

13.10.2.2 Liberia – timber and diamonds– links to regional civil wars

Liberia, one of Africa's few non-colonial states, became independent in 1847, being ruled by a small, wealthy regime dominated by descendants of African-American settlers, until overthrown in 1980 by master-sergeant Samuel Doe. Doe used a monitoring group, the Economic Community of West African States (ECOWAS) Monitoring Group (ECOMOG), to keep himself in power. Doe was finally killed and by July 1997, rebel leader Charles Taylor was elected as President in "so-called democratic elections" (Madsen, 1999). In 2003, Taylor was finally forced by the international community to flee Liberia, taking refuge in Nigeria.

Role of Logging Companies in Support of Charles Taylor

Taylor's logging revenue was an important means to provide continued support to the RUF in Sierra Leone (ANON, 2001b). By 2002, Global Witness and UN Expert Panels uncovered numerous violations of current UNSC (United Nations

Security Council) sanctions by the Liberian government and timber companies, continued human rights abuses by parastatal logging company militias, and significant inaccuracies in the UN's own research of the Liberian timber industry (Global Witness, 2002):

- The Oriental Timber Company (OTC) and Maryland Wood Processing Industries (MWPI) have continued to oversee the importation and stockpiling of illegal weapons, in contravention of UN sanctions. Global Witness investigations have uncovered at least five suspected logging ships that brought weapons into Liberia, which were unloaded at OTC's Buchanan Port and MWPI's Harper Port.
- As stated in the report, OTC and MWPI, along with Inland Logging Company (ILC) and other logging companies maintain private armed militias that are used as parastatal fighting forces for the government, committing grave human rights abuses.
- The UN Secretary-General and the Office for the Coordination of Humanitarian Affairs (OCHA) released a report in October 2001 detailing the possible humanitarian effects of timber sanctions. One report author admitted anonymously that it contained inaccurate and overstated figures. The report also failed to mention the negative effects of the industry as repeatedly outlined in previous UN Expert Panel reports.

Instability in Liberia threatened stability of other countries in the region. By not upholding sanctioning the timber industry, the UN was basically standing by and

allowing the illicit arms trade to continue, while the humanitarian disaster in Liberia escalated and Sierra Leone's peace was undermined (Global Witness, 2002).

Support of Ivorian Rebels by Charles Taylor

French and Ivorian governments say that they suspect the western rebels in the 2003 Ivory Coast civil war were not only supported by Charles Taylor, but also by the terrorist group headed by Osama bin Laden – al-Qaeda – that has reportedly traded in diamonds in West Africa. Had Taylor turned on the French, his former backers? The Ivory Coast Conflict involved a north/south divide as in Sudan, with ethnic differences, xenophobia, a Muslim north and Christian south and land (see Chapter 5, Section 5.7.4.4, Land reform and civil war in the Ivory Coast). Under President Henri Konan Bedie, the concept of *ivorite* - essentially a belief in true Ivorian blood – became popular. Migrants from Burkina Faso, as well as northern Ivorians who shared ethnic and religious ties with Muslim *Burkinabes*, felt persecuted by the largely Christian south and central Ivorians, (see Chapter 5, Section 5.7.4.4, Land reform and civil war in the Ivory Coast). Thus, support to the northern rebels by Muslim fundamentalists would seem an obvious scenario in order to destabilize one of the most stable countries in Africa, closely linked in the past to France and France's economy, with a large expatriate French population and the largest producer of cocoa in the world. The currently elected President Laurent Gbagbo won his position at the exclusion of Alassane Ouattara, a popular northerner, because a court said that he lost his citizenship by using a diplomatic passport from Burkina Faso in the 1970s (Wax, 2003).

Is this possibly another American-French conflict using proxies? It is certain that the United States is interested in controlling the cocoa market (Madsen, 1999). In November, 2004, President Jacques Chirac of France denounced President

Gbagbo's regime as questionable. In December 2004, Mrs. Sarata Ottro Zirignon-Toure, President Gbagbo's deputy chief of staff, visited Washington, D.C. accusing France's 7,000 troops of colluding with the rebels. On November 4th, Gbagbo's troops undertook a preemptive strike against the rebel and French troops to counter what they believed to be a planned rebel offensive. In return, France destroyed the Ivory Coast's air force. France claims that it is there to enforce the cease fire, protect French citizens and economic interests. The Ivory Coast accuses France of operating outside the control of the United Nations' 6,000 peace keepers and in trying to impose neo-colonial control and in stopping the opening of the country to foreign investment, especially U.S. interests (Morrison, 2004).

Taylor's Departure from Liberia

A chain of events led to the forced departure of former President Charles Taylor on 11 August 2003, to take up an offer of asylum in Nigeria with a peace agreement signed on August 18, 2003 in Accra, Ghana. This agreement provided for the disarmament of an estimated 40,000 fighters and the formation of a broad-based transitional government guiding Liberia to fresh elections in 2005 (Human Rights Watch, 2004a).

"During the year's first half the rebel groups Liberians United for Reconciliation and Democracy (LURD) and Movement for Democracy in Liberia (MODEL)⁵⁵⁵ overran much of the country, and by midyear LURD was camped on the outskirts of Monrovia, indiscriminately shelling the city center. Other factors came into play: evidence of Taylor's business connections to al-Qaeda; U.S. President George W. Bush's visit to Africa in July, 2003; the Sierra Leone Special Court's unsealing of its indictment of Taylor for charges relating to responsibility for the war in that country; and international media attention. In August the Economic

⁵⁵⁵ Both LURD and MODEL were established to overthrow Charles Taylor

Community of West African States (ECOWAS) deployed about 2,000 Nigerian peacekeepers in Monrovia, and the United States positioned 3 ships off the coast, with 2,300 marines in reserve. The ECOWAS peacekeepers brought some control to Monrovia, and on 1 October, 2003 a UN peacekeeping mission took over from ECOWAS, to reach 15,000 peacekeepers in 2004, the UN's largest mission anywhere. A National Transitional Government of Liberia, inaugurated on 14 October, will be in power until the elections in 2005" (World Economic Forum, 2004).

"The rural areas of Liberia continue to be plagued by insecurity, and protection of the civilian population remains an urgent priority. By December 2003, only 5,000 peace keepers from United Nations Mission in Liberia (UNMIL) had been deployed, with promised contributions of troops from Pakistan, Bangladesh, Ethiopia and Ukraine yet to arrive. In this vacuum, all 3 factions (government forces, LURD, and MODEL) continued both to fight among themselves and to harass and attack the civilian population" (Human Rights Watch, 2004a).

As of mid-November 2003, there were armed skirmishes between members of the three warring factions, with all three being involved in human rights abuses of civilians, including forced labor (portering food and looted goods), rape and sexual violence, as well as looting of civilian property, especially food items (Human Rights Watch, 2004a) .

In January 2004, the UN Commission of Human Rights requested that Nigeria hand over former President Charles Taylor to the Special Court for Sierra Leone for war crimes in association with his support of Sierra Leonean rebels and urged the UN Security Council to ensure that the United Nations Mission in Liberia (UNMIL) deploy rapidly country-wide in Liberia to fulfill its mandate to protect civilians. It also recommended that no one be given amnesty for human rights abuses (Human Rights Watch, 2004a). By mid-2005, Nigeria continued to protect Taylor, refusing to hand him over to the special court. By March 2006, Nigeria turned Charles Taylor over to the UN-backed Special Court in Sierra Leone that

has in turn requested that he be tried in the Netherlands. Taylor is charged with “11 counts of war crimes and crimes against humanity, stemming from his role in Sierra Leone’s brutal civil war” (VOA, 2006). It should be clearly understood that there are many “Charles Taylors” in Sub-Saharan Africa.

“His trial was resisted by many African leaders precisely because so much of the continent is still ruled by megalomaniacal ‘Big Men,’ who should be held accountable for the systematic destruction of their own countries...Taylor fell where the others have not because he picked a fight with the international community” (Farah, 2006),

including abduction of 500 UN Peace Keepers from Sierra Leone and al-Qaeda links through the sale of diamonds (Farah, 2006).

By April 2004, the United Nations reported that only half of the combatants participating in the disarmament campaign in Liberia were handing in weapons, renewing fears that rebel leaders had collected guns to be shipped to other West African nations, causing further instability in the region. According to the United Nations, in the first six days only 1,800 former rebels from LURD and MODEL turned in less than 800 weapons (Giardino, 2004).

Liberian Child Soldiers Move on to the Ivory Coast

In early 2005, Humans Rights Watch accused the Ivory Coast government forces of recruiting child soldiers less than 15 years of age, who had fought in Liberia, to join militias supporting President Laurent Gbagbo. With the end of war in Liberia, but never having received the education and support promised (no money or food) when they disarmed, these child soldiers are prepared to sell their services to the highest bidder, in this case the Ivorian government, that is committing a war crime by doing so (Menezes, 2005b).

In run-off elections of November 2005, Ellen Johnson Sirleaf became President and appears to be moving her country in a positive direction. In February 2007, the United States and Germany promised to forgive bilateral debt (Melton, 2007b). In May 2007 the United Nations lifted the ban forbidding Liberia to trade in diamonds (Schwartz, 2007). However, a major problem today is that many of the high level Liberian government officials are diaspora who were either born or raised outside of Liberia, or fled the civil war 15-20 years ago and became American citizens or hold green cards. For the most part their children and assets remain in the USA. Many locals fear that they are only in Liberia to cash in, ready to flee if things don't work out, having more of an allegiance to the United States or themselves than to Liberia and its people. Some believe there is a risk that this diaspora will behave similarly to the Americo-Liberian elite, ex-American slaves and their descendants who colonized Liberia and monopolized political power, restricting the voting rights of the indigenous population at independence in 1847 until 1980 (ANON, 2007). In fact, Liberia's new auditor general, John Morlu The Second, stated that the current government, mainly at the level of the government ministers and agency directors, is three times more corrupt than the Gyude Bryant transitional government (Butty, 2007c) that ran Liberia for two years until the above democratic elections were held.

13.10.3 Congo-Kinshasa DRC, Sub-Saharan Africa's world resource war

"I find it particularly remarkable that the diamond exports from the Democratic Republic of Congo (DRC) were some US\$ 897 million in 1997...Based on my research, this is a western syndicated proxy war, and like Sierra Leone, Angola and Sudan, it is war-as-cover for the rapid and unrestricted extraction of raw materials, and war as a means to totally disenfranchise the local people. Diamonds,

gold, columbium tantalite (COLTAN),⁵⁵⁶ niobium, cobalt, manganese and petroleum, natural gas and timber and possibly uranium -- are a few of the major spoils being pillaged behind the scenes as war ravages DRC and some of these minerals are almost solely found in DRC, especially cobalt, niobium, columbium tantalite..." (Snow, 2001 *In: McKinney, 2001*).

The war in the Democratic Republic of Congo (DRC, formerly Zaire) has drawn in the troops of seven other African countries who have fought alongside perhaps a dozen Congolese armies and militias. It is sometimes called "Africa's First World War". The conflict has been closely linked to the exploitation of the country's vast mineral resources, including diamonds, copper, cobalt, gold and columbite-tantalite (COLTAN) (Ross, 2002) and petroleum. This appears to be about greed and a struggle internally, regionally and internationally to control the flow of the Democratic Republic of Congo's mineral wealth. A question that must be raised is whether it is in the interest of many of these factions to see the war end, as this would mean many groups would give up their access to this wealth.

Illegal mining of COLTAN helped to fund the war in Democratic Republic of Congo, resulting in the death of innocent people and contributing to the decline of wildlife killed for food or income by refugees and soldiers (Eves, Stein, Wilkie & BCTF, 2002). Refined COLTAN produces a highly heat-resistant metal powder called tantalum selling for US\$ 220/kg (US\$ 100/pound) (Essick, 2001) to US\$ 400/kg (UN, 2006) to as high as US\$ 800/kg (Peterson, 2003) used to make, among other things, capacitors that manage the flow of current in electronic devices (Vesperini, 2001; Delawala, 2001; UN, 2006). It can be found in everything from cell phones, DVDs, computers and stereos to VCR's (Essick, 2001; Delawala, 2002; Survivors' Rights International, 2004; UN, 2006). While most of the worldwide tantalum supply - valued at as much as \$6 billion a year -

⁵⁵⁶ Columbite-Tantalite = COLTAN.

comes from legitimate mining operations in Australia, Canada and Brazil (Essick, 2001), the Democratic Republic of Congo contains 80% of the world's reserves of COLTAN (Vesperini, 2001).

It is estimated that since 1998, when the war began, three million lives have been claimed from the war, malnutrition and disease (Duke, 2003; Human Rights Watch, 2003; World Economic Forum, 2004), the highest death toll of civilians since WWII (Human Rights Watch, 2003). The Commission for Africa (2005) estimates that 1,000 people are dying/day. Much of the slaughter is ethnically (World Economic Forum, 2004) and resource driven. A recent study by the International Rescue Committee found that five years after the war in DRC officially ended, the rate at which people are dying remains virtually unchanged at 45,000 a month and a total of 4.5 million since 1998. Only a tiny percentage are dying from violence, most succumbing to disease and likely malnutrition. Children account for 50% of the non-combat related deaths (Maphosa, 2008).

The Democratic Republic of Congo remains a country split into three main zones of control. Most of the northern part of the country is under Liberation Front of the Congo/*Front de Libération du Congo* (FLC) control, with support from the Ugandans. Much of eastern Democratic Republic of Congo is controlled by the Congolese Rally for Democracy/*Rassemblement Congolais pour la Démocratie - National* (RCD-Goma), with the support of the Rwandan army (OXFAM, 2001). The situation in the Democratic Republic of Congo is extremely complicated with many factions, both national and international, vying for the spoils of this rich, but impoverished country. This analysis does in no way purport to enter into any detail regarding these groups.

Additional groups in the eastern Democratic Republic of Congo include (Human Rights Watch, 2005):

- RCD-National: Congolese Rally for Democracy/National (*Rassemblement Congolais pour la Démocratie - National*) (RCD-National) in Isiro and Watsa of northeast, in theory integrated into the Democratic Republic of Congo's transitional government.
- RCD-ML: Congolese Rally for Democracy – Liberation Movement (*Rassemblement Congolais pour la Démocratie – Mouvement de Libération*) (RCD-ML) in Beni in North Kivu, in theory integrated into the Democratic Republic of Congo's transitional government.
- FNI: Lendu Nationalist and Integrationist Front/*Front des Nationalistes et Intégrationnistes* (FNI) linked to Uganda in the Ituri Forest region supported by Uganda.
- UPC: Hema Union of Congolese Patriots/*Union des Patriotes Congolais* (UPC) supported by Rwanda in Ituri Forest region; with two factions - UPC-K and UPC-L.
- FAPC: People's Armed Forces of Congo/*Forces Armées du Peuple Congolais* (FAPC) in Ituri Forest area supported by Uganda.
- PUSIC: Party for Unity and Safeguarding of the Integrity of Congo/*Parti pour l'unité et la sauvegarde de l'intégrité du Congo* (PUSIC) of ethnic Hema in northeastern DRC.
- FRPI: Patriotic Force of Resistance in Ituri/*Force de Résistance Patriotique d'Ituri* (FRPI), made up of ethnic Ngiti (Lendu from the south) who operate in areas south of Bunia.

It was not long before a new war broke out, which was the beginning of drawing in Rwanda and Uganda who are supported both militarily and financially by the United States (Madsen, 1999) (see, 13.8.6 Former Cold War allies vying for power in the Great Lakes Region and discussions below).

After helping Kabila's AFDL/ADFL take control of the Democratic Republic of Congo in 1996, Kabila was pressured to expel Tutsi influences, the combined Rwandan/Ugandan forces that put him in power. He ordered the Tutsi allies out of office and the Rwandan military forces out of the Congo, fanning the flames of ethnic hatred by inciting violence against the Tutsi by once again collaborating with their enemy, the Hutu militia. This was the beginning of drawing in countries from southern Africa, as well as logistical support from Libya and Chad. In turn, Uganda and Rwanda allied themselves with Angola's UNITA (Pech,

2000 *In: Musah & Fayemi, 2000*). Africa's First World War was underway, beginning in 1998.

The western and southern parts of the country remain under the government's control, with military support from Angola, Zimbabwe and Namibia. Since March 2001, fighting along the conventional frontline between these rebel movements and the government/allied forces has more or less ceased (OXFAM, 2001).

13.10.3.1 U.S. government involvement in the DRC

"Minerals are vital to maintaining U.S. military dominance, economic prosperity, and consumer satisfaction. Because the United States does not have a domestic supply of many essential minerals, the U.S. Government identifies sources of strategic minerals, particularly in Third World countries, and then encourages U.S. corporations to invest in and facilitate production of the needed materials. Historically, the DRC (formerly Zaire) has been an important source of strategic minerals for the United States. In the mid-1960s, the U.S. Government installed the dictatorship of Mobutu Sese Seko, which ensured U.S. access to those minerals for more than 30 years (see Chapter 11, Section 11.6.6.1, The Katanga story, an "African Solution" to democracy thwarted by the 'Cold War' and beginning of French/American struggle over a quest for Africa's riches).

The United States claims that it has no interest in the DRC other than a peaceful resolution to the current war. Yet U.S. businessmen and politicians are still going to extreme lengths to gain and preserve sole access to the DRC's mineral resources. The U.S. Government continues to provide millions of dollars in arms and military training to known human rights abusers and undemocratic regimes. Thus, the DRC's mineral wealth is both an impetus for war and an impediment to stopping it" (Montague & Berrigan, 2001).

U.S. trained Kagame's Rwandan Patriotic Front (RPF) joined with members of Yoweri Museveni's Ugandan People's Defense Forces (UPDF) and Laurent

Kabila, a Congolese rebel leader, in toppling Mobutu Sese Seko (Madsen, 1999; Montague & Berrigan, 2001). Mobutu Sese Seko had also been trained by the U.S. at Fort Belvoir, Virginia, in the early 1950s (Madsen, 1999), but with the Cold War over, he had served his purpose and was considered expendable by the United States, especially as he appeared to be aligning himself with the French (see Section 13.8.6.11, French and U.S. arm proxies for the takeover of the DRC).

Madsen (1999) argues that both “soldier princes”, Museveni of Uganda and Kagame of Rwanda, along with Kabila of the Democratic Republic of Congo, were proxies of American post-Cold War policies to access the Democratic Republic of Congo’s valuable natural resources to the exclusion of the French (see Section, 13.10.3 Congo-Kinshasa DRC, Africa’s world resource war) (Madsen, 1999). Both Uganda and Rwanda also wanted to form a regional political economic federation of central African states with geographical reconstruction of borders, stability, increased development and trade.

As an advisor to the then military leader, Kagame said,

“ ‘America can live without the Congo, Rwanda cannot...by itself ours is a non-viable country’ ” (Pech, 2000 *In: Musah & Fayemi, 2000*).

The future of the Democratic Republic of Congo (the Congo, old Zaire and Congo Belge), the richest resource endowed country in Sub-Saharan Africa, is one of the most important issues since the end of Apartheid in South Africa (Pech, 2000 *In: Musah & Fayemi, 2000*) that may very well determine the long-term stability of the continent. So far the net result of their intervention has been more resource looting by all sides and hunger and malnutrition growing on a daily basis, seemingly a war without end.

Attempts by the French in the UN Security Council to send multi-national peace keeping forces to stop the civil war in Zaire and to protect refugees appears to have been blocked by the U.S. (Madsen, 1999), as this would obviously have kept Mobutu Sese Seko in power, who appeared to have turned away from the United States towards France and thus allowed the continuation of French hegemony (see Section 13.8.6 Former Cold War allies vying for power in the Great Lakes Region).

Laurent Kabila, a failed Marxist revolutionary running a small shop (some say also a brothel) (Guest, 2004) in Dar es Salaam, was America's handpicked puppet to replace Mobutu Sese Seko. This was the very same Kabila that the Marxist revolutionary Ché Guevara (2001), in his book, *The African dream. The diaries of the revolutionary war in the Congo*, explains that in 1965, although Kabila had leadership qualities, he was too occupied with drink, women and the good life in Dar es Salaam, spending little time in the then Congo Belge. In Guevara's eyes, Kabila lacked seriousness, ideology and a spirit of sacrifice. Guevara left in disgust after about six months, believing that a communist revolution could never take place under such leadership. However, Kabila was good enough to serve as a "puppet" leader to the United States; at least this is what they thought. Some U.S. Intelligence officials were not keen on Kabila,

" 'Mobutu may be a corrupt bastard but at least he was our corrupt bastard' " (Madsen, 1999).

"Laurent Kabila enjoyed the support of Western military interests. Kabila was in frequent contact with Richard Orth, former deputy of the U.S. Defense Intelligence Agency (DIA) for Africa. The agency, which operates as an arm of the Pentagon supplies military intelligence to war fighters and weapons dealers around the world. During the Clinton administration, Orth was appointed U.S. military attaché to Kigali, the Rwandan capital, shortly before Kabila began his march across the DRC. Additionally, former Pentagon officials acted as military advisers to Kabila in Goma,

producing a dangerous mix of business, politics, and military power” (Montague & Berrigan, 2001).

Madsen (1999) confirms these relationships.

The Alliance of Democratic Forces for the Liberation of Congo/*Alliance des Forces Democratique pour la Liberation du Congo* (AFDL/ADFL)”, a coalition of RPF, Ugandan People’s Defense Forces (UPDF) and Kabila’s forces also sought to dismantle camps controlled by the Hutu militia responsible for the Rwandan genocide. The AFDL coalition included U.S.-trained troops. Although Rwandan troops who participated in the AFDL invasion committed gross human rights abuses that a UN report labeled “crimes against humanity”, the U.S. Government continued to provide military support to the Kagame regime (Madsen, 1999; Montague & Berrigan, 2001). U.S. Special Forces were active in 1996 and 1997 along side Kabila in eastern Zaire and both satellite imagery and aerial photographs of Hutu refugee camps in the forest were provided to the Tutsi alliance, apparently by the United States government. This information was used to locate and massacre refugees in these camps. It is estimated that Kabila’s troops committed genocide of about 250,000 Hutu refugees from Rwanda and thousands more eastern Mai Mai guerrillas and various tribal minorities (Madsen, 1999).

Laurent Kabila was making enemies right and left with many mining companies, taking money from one company, while signing mining rights to the same concession to another (Madsen, 1999). He was not playing the game and, being expendable, was assassinated with many speculations as by whom. His son Joseph, a former automobile mechanic in Dar es Salaam and not a very good one at that (Mantheakis, 2005), more conversant in English and Swahili than French and Lingala, the dominant language in the west of the country, was put into power at age 29 (Leymarie, 2001), making him the youngest President in the world. He

is also said to have been a taxi driver (Reuters, 2005; Blair, 2006a; 2006b; 2006c; Pambazuka News, 2006). Others say that he was his father's "right arm" in business and possibly politics in Dar es Salaam (Kiesel, 2005). He basically grew up in Tanzania, had some military training in Rwanda and apparently began, but never finished university training in Uganda (CIDOB, 2001). When his father took over the Democratic Republic of Congo, he was also sent for military training for three months in China (CIDOB, 2001) and was then appointed general (CIDOB, 2001; Leymarie, 2001) and head of the Democratic Republic of Congo's army. Since becoming President, it appears that he has received a distance learning bachelor's degree in international studies and diplomacy from Washington International University (IRIN, 2006). This university is neither accredited by a U.S. Department of Education agency nor by the U.S. Distance Learning Association (USDLA, 2006), nor currently accredited by the national Council on Higher Education Accreditation while degrees from this university are not recognized by Michigan's Department of Civil Service (Michigan.gov, 2006).

There are differences of opinions as to whether Joseph is the legitimate son of Laurent Kabil (Kiesel, 2005; Southscan, 2005) and even if he is, if his mother is a Democratic Republic of Congo national – some saying she is Rwandan (Leymarie, 2001; Southscan, 2005), which may make it difficult for him to demonstrate both his parents were Congolese citizens, potentially impacting his ability to run for state president, though parliament has yet to set conditions (Earthscan, 2005). So little is clearly known of Joseph Kabil's past, fact and fiction being hard to distinguish. What is obvious is that he is too young and inexperienced to run possibly the mineral richest country on the continent, but then he does not have to if he is a prop, with Western interests calling the shots as usual. One problem appears that neither Laurent Kabil nor his son Joseph have been recognized as the legitimate leaders of the Democratic Republic of Congo in

the eastern part of the country, nor is the eastern Democratic Republic of Congo itself united (Hart & Mwinyihali, 2001).

13.10.3.2 U.S. military aid

During the Cold War, the U.S. government shipped \$400 million in arms and training to Mobutu Sese Seko. The William (Bill) Jefferson Clinton administration transferred its military allegiance to Rwanda and Uganda. In 1998, President Clinton praised Presidents Paul Kagame and Yoweri Museveni as leaders of the “African Renaissance”, just a few months before they invaded the Democratic Republic of Congo with U.S. weapons and training. France, Serbia, North Korea, China and Belgium share responsibility, but the U.S. helped to open networks and supply lines, as well as provided arms (Montague & Berrigan, 2001). Alemayehu (2000) implicates both America and France in proxy wars in the Democratic Republic of Congo. By the time it was all over, despite an embargo, illegal arms were being supplied by America, France and South Africa, some to both sides (Madsen, 1999).

As late as mid-2007, the U.S. military is still heavily involved in the Great Lakes Region. The U.S. has backed a meeting of military leaders from DRC, Burundi, Rwanda and Uganda in Kigali, Rwanda to develop various scenarios against rebel forces in the region that involve unilateral action by the DRC up to combined action with the military from these other countries, as well as diplomatic action by the UN or AU (Rippe, 2007). This and a follow-up meeting in Uganda, along with a statement by the U.S. Assistant Secretary of State for Africa Jendayi Frazer that if talks between the Lord’s Resistance Army (LRA) and Uganda did not end in peace in the near future, Washington would support efforts to wipe out the rebels, brought an outcry by the LRA. The LRA stated that any attempt to go

after it in the eastern DRC would mean a return to full scale war (Wadhams, 2007b).

13.10.3.3 International financial lending institution involvement

In 1999, the Congolese Rally for Democracy/*Rassemblement Congolais pour la Démocratie - National* (RCD-Goma)'s financial arm – known as SONEX – received \$5 million in loans from Citibank New York. The International Monetary Fund (IMF) and World Bank have knowingly contributed to the war effort. The international lending institutions praised both Rwanda and Uganda for increasing their Gross Domestic Product (GDP), knowing that it resulted from the illegal mining of the Democratic of Congo's resources. Although Uganda has made strides in improving access to education and reducing rates of AIDS infections, debt relief by Western donors has also allowed it the space to appropriate more money for its military ventures (Montague & Berrigan, 2001).

13.10.3.4 Corporate wars

“In the DRC, valuable mineral resources provided the incentive for international companies to deal with rebels, with revenues transferred into personal bank accounts that were used to purchase more arms to sustain the war” (Transparency International, 2003).

The Ugandan army withdrew from Congo in 2003, following Rwanda the previous year (Human Rights Watch, 2005).

“Each left behind local proxies, the Lendu Nationalist and Integrationist Front/*Front des Nationalistes et Intégrationnistes* (FNI) linked to Uganda, and the Hema Union of Congolese Patriots/*Union des Patriotes Congolais* (UPC), supported by Rwanda” (Human Rights Watch, 2005).

These groups were more than prepared to help sign agreements with the international private sector for mineral rights (Human Rights Watch, 2005).

In January 2001 the Congolese Rally for Democracy/*Rassemblement Congolais pour la Démocratie - National* (RCD-Goma) issued a statement that said it was selling mining “‘monopolies’” in areas it controlled, while the area controlled by Jean Pierre Bemba in the north has become a separate economy with foreign entrepreneurs developing businesses for a market of seven million people (Hartung & Montague, 2001).

“Despite recent troop withdrawals, illegal mining and trade continue unabated. The real party fueling the conflict is foreign capital investment by corporations, with the tacit support of their own governments. This war of genocidal proportions cannot end until U.S. and other Western corporations and governments are forced to change their priorities. Amnesty International, Human Rights Watch, and other organizations have helped to raise international awareness about the urgency of the situation in the DRC, through campaigns against ‘blood diamonds,’ economic exploitation, and the massive humanitarian crisis the country faces. But the DRC’s future is in the hands of its youth, the next generation, the students and grassroots organizers who are dedicated to establishing peace and stability in their country. It remains to be seen whether the United States will encourage this hopeful spirit of change and democracy, or continue to enable the exploitation and destruction of the most resource-rich country on the African continent” (Montague & Berrigan, 2001).

Similarly, the Commission for Africa (2005) concludes the following regarding the multi-nationals and the role they play in destabilizing the subcontinent:

“Sometimes, unwittingly, they make matters worse by hiring security firms to protect their operations. These private armies can become involved in human rights violations. Their arms can be seized by rebel groups. They can crank up tensions further by hiring staff from one social or ethnic group at the expense of another...But some companies knowingly fuel conflict. They pay

substantial sums to oppressive governments or to warlords. Some firms even assist with arms purchases. Some of these actions, like bribery of a local official, are straightforward crimes. Others, like forcibly moving indigenous people from their lands, are illegal under international law. But many of their actions are not crimes – and at present the various voluntary corporate codes of conduct, such as the OECD Guidelines on Multinational Companies, do not provide clear enough guidance on what companies should do in these situations”.

On October 27, 2003, a coalition of NGOs recommended that the United Nations Security Council insist that member states conduct investigations into their multi-national corporations from Asia, Europe and North America, profiteering from the war in the Democratic Republic of Congo. The Security Council was to examine the final report of the Panel of Experts examining the illegal exploitation of natural resources in the Democratic Republic of Congo, which was established in 2000 and which has demonstrated that a drive to control natural resources was a major motive driving the multi-front war. The coalition accused the Security Council of failing to act on previous reports of the panel showing linkages between various corporations and armed groups carrying out massacres and other atrocities. The NGO coalition recommended that both the Security Council and member states must conduct open and transparent investigations using the Organization for Economic Cooperation and Development (OECD) process or other judicial procedures to clarify the role that companies have played in the conflict in the Congo. The Prosecutor of the International Criminal Court (ICC) said his office may also investigate the way businesses have contributed to the prevalence of war crimes and crimes against humanity in the Democratic Republic of Congo. The current fragile peace process in the Democratic Republic of Congo risks failure unless it addresses the underlying economic motivations that have driven the war (Human Rights Watch, 2003; World Economic Forum, 2004). Since many of these companies are American and the UN seems to operate at the whims of the U.S., it is unclear how effective any of this will be, but it is

the beginning of creating transparency and accountability among the international private sector involved in resource extraction.

The “UN Expert Panel set up to investigate the alleged role of local and multinational companies in the conflict in the Democratic Republic of Congo found that as many as 85 companies were guilty of violating the OECD Guidelines on Multinational Enterprises. However, in the two years since the Panel’s report was released, follow-up action has been initiated against only a small handful of these” (Commission for Africa, 2005).

U.S. Corporations

During the conflict, U.S. corporations treated rebel-controlled Zairian territory as open for business, even while Mobutu Sese Seko remained the internationally recognized leader of Zaire. Once the AFDL took control of Katanga (one of the Democratic Republic of Congo’s richest mineral patches), Western friends and allies began negotiating with Kabila for access to mineral resources (Madsen, 1999; Montague & Berrigan, 2001).

American Mineral Fields (AMF)

The sale of booty futures has played two key roles in the conflict: in the first phase, aiding Kabila’s victory over Mobutu Sese Seko and in the second phase, saving the Kabila government from almost certain defeat. To raise money needed to take Kinshasa, Kabila and the Alliance of Democratic Forces for the Liberation of Congo /*Alliance des Forces democratique pour la liberation du Congo* (AFDL/ADFL), a rebel force, struck a deal with American Mineral Fields (AMF), a small US-based mining firm (see Section 13.10.1.4, Petroleum war, Congo Brazzaville). In exchange for an undisclosed sum of cash (and apparently the use of AMF’s chartered Lear jet), AMF received a diamond-purchasing monopoly and after the war, exploration rights to huge reserves of Congolese cobalt, zinc

and copper (Madsen, 1999; Ross, 2002). Peleman (2000 *In: Musah & Fayemi, 2000*) places this “undisclosed payment” as US\$ 25,000.

Montague and Berrigan (2001) suggest that

“in May 1997, American Mineral Fields (AMF) – whose chair is Mike McMurrough, a personal friend of President Clinton – cut a US\$ 1 billion mining deal with Kabila. AMF performed feasibility studies on reactivating the Kipushi mine, a high-grade zinc and copper deposit and landed exclusive exploration rights to an estimated 1.4 million tons of copper and 270,000 tons of cobalt (about ten times the volume of current world cobalt production)”.

Much of this is confirmed by Madsen (1999) and Hartung and Montague (2001).

Bechtel Corporation

“Also in 1997, Bechtel, the engineering and construction company, established a strong relationship with Kabila. Bechtel – whose history of collaboration with the CIA is well documented in Laton McCartney’s 1989 book, ‘Friends in High Places’ – drew up a master development plan and inventory of the country’s mineral resources free of charge. Bechtel also commissioned and paid for NASA satellite studies of the country for infrared maps of its mineral potential. Bechtel estimates that the DRC’s mineral ores alone are worth \$157 billion” (Montague & Berrigan, 2001).

Hartung and Montague (2001) also discuss these relations. Kabila was still a rebel leader through these deals with the American private sector (Hartung & Montague, 2001).

Chevron

“In January 2000, Chevron – the corporation that named an oil tanker after National Security Advisor (under the George W. Bush administration) Condoleezza Rice – announced a 3-year, \$US 75 million spending program in the DRC, thus challenging the notion that war discourages foreign investment. In 1999, the company, which has been present in the Congo for 40 years, was producing 17,700 bpd. It hopes that, by 2002, production will increase to 21,000 bpd. The gamble seems to be paying off. When Joseph Kabilo, Laurent Kabilo’s son and successor (Kabilo was assassinated), visited the United States earlier in the year, he reassured Chevron officials that stability under his leadership would ensure a safe environment for investment” (Montague & Berrigan, 2001).

Phillips (2004) confirms former Chevron director Rice’s ties to the oil industry and the 129,000 ton Bahamas-registered Chevron oil tanker named after her.

Barrick Gold, Inc. of Canada

“One of the major goals of the Rwandan-backed Congolese Rally for Democracy/*Rassemblement Congolais pour la Démocratie – Mouvement de Libération* (RCD-Goma), a group fighting the Kabilo government in Congo, is restoration of mining concessions for Barrick Gold Inc. of Canada. In fact, the rebel RCD government’s ‘mining minister’ signed a separate mining deal with Barrick in early 1999. Among the members of Barrick’s International Advisory Board are former President Bush (Senior)⁵⁵⁷ and former President Clinton’s close confidant Vernon Jordan.

Currently, Barrick and tens of other mining companies are stoking the flames of the civil war in the Democratic Republic of Congo. Each benefits by the de facto partition of the country into some 4 separate zones of political control. First the mineral exploiters from Rwanda and Uganda concentrated on pillaging gold and diamonds

⁵⁵⁷ The relationship between George Bush Sr. and Barrick Gold, Inc. is also raised in Ruppert (2004).

from the eastern Congo. Now, they have increasingly turned their attention to a valuable black sand called columbite-tantalite or ‘COLTAN.’ COLTAN is a key material in computer chips and, therefore, is as considered a strategic mineral” (Madsen, 2001 *In:* McKinney, 2001).

South Africa Private Sector Jockeying for Control

It appears that Anglo-American of South Africa then “convinced” Kabilia to do an about face and drop its deal with AMF, resulting in a US\$ 3 billion lawsuit against Anglo-American and its affiliates De Beers and Minorco Group – this being dropped in a “backroom” deal in which AMF and Anglo-American went into a joint venture – that went sour as the Tutsi-led anti-Kabilia rebellion broke out in August, 1998 (Madsen, 1999; Peleman, 2000 *In:* Musah & Fayemi, 2000).

Human Rights Watch (2005) accuses South Africa’s AngloGold Ashanti,⁵⁵⁸ one of the largest gold producers in the world, of starting gold exploration activities in the northeastern Democratic Republic of Congo under protection of the rebel group FNI in return for financial and logistical support. The FNI⁵⁵⁹ has created grave human rights violations and is not part of the Democratic Republic of Congo transitional government.

Zimbabwe’s Private Sector Involvement

As part of a deal in what some call the second⁵⁶⁰ Congo war (Human Rights Watch, 2005) to keep Kabilia in power in 1998 from an invading Tutsi army, diamonds, cobalt, copper and germanium were taken from the “Government

⁵⁵⁸ 11 Diagonal Street, Johannesburg, South Africa.

⁵⁵⁹ Lendu Nationalist and Integrationist Front/*Front des Nationalistes et Intégrationnistes* (FNI), Lendu ethnic group serving as proxy army in the Democratic Republic of Congo for Uganda, after Uganda pulled out of Democratic Republic of Congo in 2003.

⁵⁶⁰ The first Congo war was in 1996 in which combined Ugandan, Rwandan and Kabilia forces invaded the Democratic Republic of Congo to oust Mabutu.

Controlled Area” (Burke & Barnett, 2002; *The Observer*, 2002a *In:* Bond & Manyanya, 2003). Sweet deals were cut with Leo Mugabe, President Robert Mugabe’s nephew who was said to have developed business relations with Joseph Kabilá. Both wanted South African mining concerns and likely other competitors out of the deal (Madsen, 1999). A variety of Zimbabwean companies were established to profit from the Congo’s minerals sector, often through joint ventures with state-owned Congolese companies. Some of the Zimbabwe companies were partly owned by the Zimbabwe Defense Force while others were owned by individual Zimbabwean officers. Zimbabwe’s President Robert Mugabe rushed 10,000 troops to the Congo and saved Kabilá’s government (Ross, 2002). US\$ 5 billion in assets were transferred from the state mining sector to private companies under the control of this “elite” network of Congolese and Zimbabwean political, military and commercial interests. There was no compensation or benefit to the state treasury. Zimbabwean-related companies that sold timber through African Hardwood Marketing in London have razed the pristine forests of teak and mahogany in the Katanga province. This company is owned by media mogul, Rupert Murdoch’s former son-in-law, Elkin Pianim and has a joint venture, SAB Congo, with a company called *Société Congolaise d’Exploitation Du Bois* (SOCEBO), partly-owned by senior figures in ZANU and the Zimbabwean military (*The Observer*, 2002b). Diamonds and mining concessions were operated through a Zimbabwe Defense Force (ZDF) company, Operation Sovereign Legitimacy (OSLEG), which in turn operated another company, COSLEG, as a joint venture with a Democratic Republic of Congo firm COMIEX-Congo (Masunda, 2001; WRM, 2002). It was believed in 2003 that most of the Zimbabwean military force had been removed.

13.10.3.5 A regional war

In September 1998, Rwandan troops were on the verge of entering the capital, Kinshasa, and removing the Kabila government. Laurent Kabila was obviously not playing the “game by the rules” as laid down by the West, so he needed to go. In exchange for support, Kabila offered future mineral rights to Zimbabwe, Angola, Namibia, China and North Korea (Madsen, 1999; Ross, 2002). A UN Panel of Experts found that Angola and Namibia were offered mining concessions “ ‘as a sign of gratitude rather than an incentive for their support,’ ” unlike Kabila’s arrangement with Zimbabwe, where the barter was more apparent (Ross, 2002).

Rwanda and Uganda Cash In

Rwanda and Uganda have fought proxy wars there, seeking to control the region’s natural resources and supporting ethnically aligned militias, while the government in Kinshasa also supported assorted militias to gain supremacy over the region (World Economic Forum, 2004).

A 2001 UN report accused Rwanda and Uganda of the “ ‘systematic and systemic’ ” exploitation of Congo’s natural resources. It alleged that, although not directly looting themselves, Presidents Museveni of Uganda and Kagame of Rwanda were on the verge of becoming “ ‘godfathers of the illegal exploitation of natural resources and the continual conflict in the Democratic Republic of Congo,’ ” by allowing their associates, including Museveni’s younger brother, to cash in (Guest, 2004).

Museveni’s wife is said to be a share holder in Busico gold mining company, operating in the rebel-controlled Democratic Republic of Congo. Kagame and his

chief of staff, Kabere, partly own Little Rock Mining, Tenfield Holdings, Colliers Ventures, Sapora Mining and Intermarket (Madsen, 1999).

In 2004, fighting broke out along the Rwandan border, with rebels taking control of Bukavu with support from Rwandan troops (Colombant, 2004b). Even in mid-2004, Corene Crossin of Global Witness states that, “ ‘Much more pressure needs to be placed on Rwanda, Uganda and Burundi to halt illegal exploitation of natural resources’ ” (Agence France-Presse, 2004). By mid-2004, war appeared to be breaking out along the Democratic Republic of Congo/Rwanda border. The ethnic-Tutsi Banyamulenge, with the support of Rwanda’s army, have controlled much of eastern Congo’s resource-rich economy for the past five years and appear very reluctant to give up control of the region under the Pretoria agreement, which basically demands them to hand over control to the Kinshasa government and the new national army (Colombant, 2004b).

By August 2004, the RCD-Goma announced that it was pulling out of the transitional government, in which each rebel group has a vice president, complaining that “corruption remains rampant in Congo, the promised reform of the army had not taken place, and there was a lack of preparation for elections, which are due in ten months”. However, a last minute visit by Thabo Mbeki, the President of South Africa, convinced the RCD-Goma to remain in the government (Lewis, 2004a).

By September 2004, the Democratic Republic of Congo’s soldiers were advancing on the region, fighting against General Laurent Nkunda, a Banyamulenge Tutsi who captured the town of Bukavu (Lewis, 2004b). With a university degree in psychology, General Nkunda was born in Northern Kivu Province and appears to have gone against the lobbying of Thabo Mbeki, pulling out of the transitional government. He fought with the RPF to take Rwanda and

then served as commander for the Rwandan-backed Congolese Rally for Democracy/*Rassemblement Congolais pour la Démocratie* (RCD-Goma), the main rebel group controlling the eastern Democratic Republic of Congo during the five year civil war. Although, General Nkunda claims to be protecting the Banyamulenge, many locals accuse him of using this as an excuse to seek power (Walker, 2004). His group has pulled out of Bukavu, residing about 130 km to the north (Lewis, 2004b) along Lake Kivu, and is known as Congress for the People's Defense.

As late as December 2004, Rwanda's army was being accused by the UN Security Council for making intrusions into the eastern Democratic Republic of Congo after Rwandan Hutu rebels based there since the 1994 Rwandan genocide (Agence France-Presse, 2004). Rwanda has sent its army into the Congo twice before, in 1996 and 1998, now to supposedly attack Rwandan Hutu militias. The last incursion led to a five year war involving seven African countries and three million deaths, mostly from starvation, as described above. A peace agreement 18 months ago was to end this war. The 2004 invasion may have been aimed at Congo's lucrative resources as much as at Hutu militias (*The Washington Post*, 2004). In retaliation, President Joseph Kabilo of the Democratic Republic of Congo sent 10,000 troops to the eastern border region. For four successive days (December 12-15, 2004) fighting took place between Rwandan-backed rebels and Congolese government troops, Kabilo declaring his country "at war" with Rwanda. Meanwhile 1,000 people are dying/day from malnutrition and disease related to the war and its aftermath (Timberg, 2004b). Until power and wealth are shared more equitably, people in these resource-rich Sub-Saharan African countries will remain squatters on their own land (Shiner, 2004b) and victims of resource wealth squandered. Peace in the Democratic Republic of Congo remains fragile.

Other Outsiders Join in the Foray

Other “proxies” who joined in what became known as the “Central African War” and “Africa War I” in support of Kabila were:

- 700 Ugandan rebels from Joseph Kony’s **Lord’s Resistance Army (LRA)** (known to have committed many human rights atrocities north of Murchison Falls);
- **Uganda National Rescue (Resistance) Front (UNRF);**
- **The National Army for the Liberation of Uganda;** and
- **The West Nile Bank Front (WNBF) and Allied Democratic Forces (ADF)** Front - Sudanese backed Ugandan Islamic fundamentalist and virulently anti-Christian group based in the Rwenzori Mountains) (see Chapter 11, Section 11.6.6.2, Uganda, democracy, civil war and attempts to find an African solution).

One of the Ugandan commanders was Taban Amin, son of ex-Ugandan dictator Idi Amin – married to the late Rwandan President Habyarimana’s daughter. Mai Mai warriors, ex-Interahamwe, former Rwandese Armed Forces/*Forces Armées Rwandaises* (RAF/FAR) regulars and members of Burundi’s rebel Hutu Forces For the Defense of Democracy/*Forces de Défense de la Démocratie* (FDD) also joined Kabila’s forces against the Tutsi invaders (Madsen, 1999).

13.10.3.6 UN intervention

It took the international community a long time to intervene. After the UN-brokered Lusaka Accord in 1999, the Security Council established a small UN observatory mission in Congo, United Nations Mission to the Democratic Republic of Congo/*Mission de l’Organisation des Nations Unies en République Démocratique du Congo* (MONUC), on 6 August 1999, with 90 UN observers expected to monitor a fragile cease-fire in a country four times the size of France (World Economic Forum, 2004). UN military observers, as part of the MONUC force, were deployed to positions along the frontline and to other key locations.

The cessation of hostilities between the major armies has given a boost to peace talks and the possible implementation of the Lusaka Peace Accords (OXFAM, 2001).

“Even with added troops in February 2000 and December 2002, MONUC had no authority to use force, and its troops were unable to intervene as civilians were slaughtered before them. Only as the atrocities in Ituri province increased in early 2003, receiving worldwide coverage, did the international community send a robust force of 1,400 EU peacekeepers under French leadership to restore security in Bunia, the Ituri district capital. Although limited in duration and objectives, the ability and willingness of the peacekeepers to use force restored a degree of security to Bunia and its immediate vicinity. Thousands of displaced Congolese citizens returned home, and political authorities were re-established. The Security Council later authorized the deployment of up to 10,800 UN peacekeepers in the Ituri province in July 2003, with a mandate permitting the use of force. The reinvigorated MONUC took over on 1 September, slowly bringing some stability to the region—though massacres continue in areas not yet under MONUC control” (World Economic Forum, 2004).

MONUC’s 10,000 troops have failed to keep both peace or disarm rebels in the vast eastern Congo where central government forces have little presence. In Bukavu and Bunia, the UN troops have stood by while local militias have raped and murdered civilians within sight of its bases (*The Washington Post*, 2004). Even worse, a recently released UN report accuses peacekeepers from Pakistan, Uruguay, Morocco, Tunisia, South Africa and Nepal of rape, pedophilia and sexual abuse of women and girls, which is widespread and ongoing (Lynch, 2004; *The Washington Post*, 2004). In the Ituri Province there are 400,000 displaced malnourished children without access to safe water, latrines, health facilities or adequate food (Schlein, 2005).

In early 2006, it was estimated that 38,000 people died every month from direct or indirect causes of the war raging on in the eastern DRC (Schlein, 2006), while

five years after the official war ended, the toll has risen to 45,000/month (Maphosa, 2008), making this the most deadly conflict since World War II, exceeding the combined deaths from conflicts in Bosnia Herzegovina, Rwanda, Kosovo and Darfur in Sudan (Schlein, 2006). Though, worse than Darfur, Sudan since CNN television is not regularly broadcasting this tragedy, for most of the world the crisis does not exist! Meanwhile, in early February 2006, the Democratic Republic of Congo adopted a new constitution, making one wonder if it applies only to Kinshasa or the entire country. By April 2006, having put their ethnic differences aside, a loose coalition of militia fighters was being organized in the Ituri District, while Congolese government forces meant to neutralize the militias have instead become involved in the illegal gold trade, all of this in the midst of the first elections in 40 years (Lewis, 2006).

An outbreak of fighting in the North Kivu province has displaced over 300,000 people from January to September 2007 (Barber, 2007c; Schlein, 2007b) linked to dissident General Laurent Nkunda who claims to be protecting ethnic-Tutsi from the Congolese government's army known as the *Front de Résistance pour la Défense du Congo* (FRDC) that is collaborating with ethnic Hutu fighters from Rwanda (Barber, 2007c). MONUC's policy of relying on persuasion rather than force to disarm hard-core Hutu militants has achieved nothing (*The Washington Post*, 2004). Plans exist to expand MONUC to 16,000 troops (Timberg, 2004b). The Democratic Republic of Congo is far from reaching peace, prosperity and democracy. An accord was broken only days after a January 23, 2008 ceasefire signed between 25 armed groups that hoped to stem the violence in eastern North and South Kivu Provinces, including Nkunda's National Congress for the Defense of the People (CNDP) and the DRC government. Fighting broke out, a CNDP spokesman claiming that their soldiers were attacked by Pareco Mai Mai and Hutu rebels from Rwanda, the DFLR: Democratic Front for the Liberation of Rwanda/Front démocratique pour la libération de Rwanda (FDLR) (Bavier, 2008). Peace in the eastern DRC appears fragile, and maybe not in the interest of

the various groups hoping to claim access to its vast resources. Some claim that the DRC is so vast and diverse, both geographically and ethnically that it will remain one country with great difficulty.

13.10.3.7 Impacts on biodiversity

Hart and Mwinyihali (2001) explain that biodiversity has been negatively impacted both outside, as well as within the World Heritage Sites of the Garamba National Park (GNP), Virungas National Park (VNP), Kahuzi-Biega National Park (KBNP) and the Okapi Faunal Reserve (OFR).

About 600,000 – one million refugees ended up around the Virungas or Albert National Park, the oldest park in Africa, having been established in 1925 (see Chapter 3, Section 3.4.2.1, Creation of parks and game reserves in Africa). Poaching and deforestation were intensive. Poaching was especially high in camps, with deposed and armed military from the old Rwandan regime. In 1999, in the sector of the Virungas National Park controlled by the RCD-Goma⁵⁶¹ rebel group, 330 buffalo and 450 antelope alone were killed in those areas accessible to park staff, implying the number killed was likely much higher. In 2000, a survey showed that the elephant population was relatively stable, ranging between 485 and 535 elephants, most likely because of their ability to move across the border to Uganda where it was safe (Hart & Mwinyihali, 2001). Vande weghe (2004) estimates that 100 park guards have been killed there since 1996, and by October 2007 an estimated 150 (King, 2007a). Since fighting erupted between forces loyal to General Laurent Nkunda and the Congolese army over a three week period in early September 2007, monitoring by park rangers has been disrupted and 10 IUCN “Critically Endangered” mountain gorillas (*Gorilla gorilla beringei*) have been killed. There are only 700 of these gorillas left in the

⁵⁶¹ Congolese Rally for Democracy – Liberation Movement (Rassemblement Congolais pour la Démocratie – Mouvement de Libération) (RCD)– supported by Kagame’s Rwanda with a base in the town of Goma.

mountainous region where the DRC, Uganda and Rwanda borders meet (King, 2007a).

The Garamba National Park (GNP) was one of the first areas impacted by armed conflict with 80,000 refugees fleeing the civil war in Sudan. Arms and ammunition were abundant and with the Sudan People's Liberation Army (SPLA) adjacent to the park, meat poaching in the northern sector was a problem. Between 1995, before the civil war, and 1998 the elephant population was halved from greater than 11,000 to less than 5,500. The buffalo decreased in the same time frame from greater than 25,000 to less than 8,000. Notable decreases were observed in hippo and hartebeest (Hart & Mwinyihali, 2001).

In 2000, elephant poaching swept through the entire Okapi Faunal Reserve (OFR), with illegal COLTAN mining camps serving as the foci for poaching and deforestation. Congolese and Ugandan military were involved in poaching from the military base of Mambasa. By early 2001, the Ugandan military in collaboration with the OFR, helped bring elephant poaching in the reserve under control (Hart & Mwinyihali, 2001).

Around the Kahuzi-Biega National Park (KBNP), internal displacements have increased population densities around the reserve to 300 persons/km². By mid-2000 there were 35,000 displaced persons around the park. Mining for gold, castorite and COLTAN, along with ivory in the lower-altitude sector of the reserve, was a major problem (Hart & Mwinyihali, 2001). Peterson (2003) noted that as the market price for COLTAN ore shot up to US\$ 800/kg, 10,000-15,000 peasant farmers abandoned their fields for mining, even inside the national park. A ground census in 2000 suggested that the gorilla population had been halved from 254 to 130. The entire population of elephants, about 350, has been decimated (Hart & Mwinyihali, 2001). Vande weghe (2004) estimates that 75%

of the gorillas may have been wiped out by Mai Mai rebels. Peterson (2003) and Redmond (2001) indicate a drastic reduction in both elephant and gorillas (Grauer's subspecies of Eastern Lowland Gorillas, *Gorilla beringei graueri*, once estimated at 17,000 was reduced 80-90%, down to 2,000 – 3,000 in three years). The “KBNP population of Grauer’s gorilla was contiguous with those in the adjacent Kasese forests, and together they represented 86% of the world total for this sub-species” (Redmond, 2001). Chimpanzees, buffalo and large antelope have also been wiped out to feed the miners and now the smaller species are being exploited and will soon be gone (Peterson, 2003). While miners make US\$ 80/day or more – extraordinary by local standards, the majority of the profits go to the “Big Men”, leaders of the guerrilla factions controlling the area and charging taxes, traders in the cities and foreign middlemen linked to Western consumption (Peterson, 2003). Attempts by the UN High Commission for Refugees (UNHCR) to set up a refugee camp in this park (which would have been devastating to both the wildlife and vegetation) were halted thanks to the efforts of the park warden and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (Vande weghe, 2004).

Likewise, next door the anarchy resulting from the Rwanda genocide that is linked to what happened in the Democratic Republic of Congo, resulted in the Akagera National Park (created in 1932 by Belgium), a savanna area in the east, being reduced from 250,000 to 100,000 ha by 1996 (Vande weghe, 2004).

13.11 AFRICA’S POTENTIAL WATER WARS

Water shortages are a growing problem in many parts of the world. To meet the needs of people and the environment, renewable freshwater resources of 1,700 m³/year/per capita are considered adequate. Below that, supplies are short: a figure between 1,700 and 1,000 m³/year means water stress, while less than 1,000

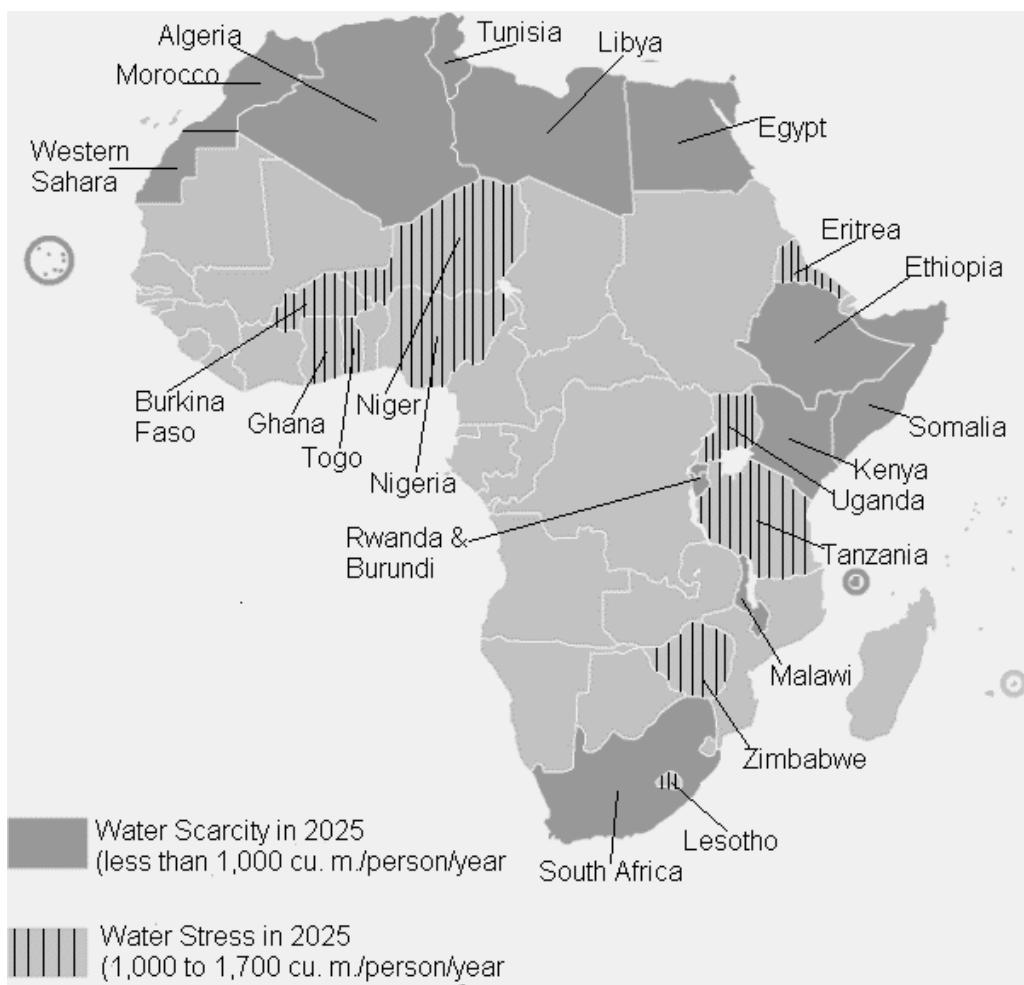
$\text{m}^3/\text{year}/\text{per capita}$ represents water scarcity. The minimum human water requirement is considered $1,000 \text{ m}^3/\text{year}/\text{per capita}$ (Klare, 2001).

Less than 3% of the world's total water supply is fresh water. About 66% (2/3rds) of the fresh water is tied up in glaciers and polar ice caps. Much of the rest is sequestered in the soil and deep underground aquifers. Less than 1% of the world's freshwater water supply or about 0.01% of all water on earth is accessible to the human population. It is estimated that only about 50% (1/2) of the $12,500 \text{ km}^3/\text{year}$ of available fresh water is actually being used. However, while the world population doubled between 1950 and 1990, global water use increased by 300%. Water use and availability is not evenly distributed (Klare, 2001).

Human consumption and sanitation is the most important use of water, though it takes only 10% of the available supply. Globally, irrigation is the largest consumer of water, taking an estimated 70% (Lake & Souare, 2002; Brown, 2002). Irrigation likely takes a smaller share in Africa, where only 7% of cropland is irrigated, compared to 17% worldwide (Lake & Souare, 2002). FAO (1997a *In: Barbier*, 1998) estimates that 6% (11,580,000 hectares) of Africa's current cropland (193 million hectares) is under irrigation (see Chapter 5, Section 5.12.1.3, Irrigation potential). By 2000, it is estimated that Sub-Saharan Africa had about 5.2 million ha in irrigation or 3.7 % of the arable land under cultivation (see Chapter 5, Section 5.12.1.3, Irrigation potential). It takes about 1,000 tons of water to produce every ton of grain (Brown, 2002; 2003).

It is estimated that the African continent has 35% of the world's untapped hydro-potential, 67% (2/3rds) of it in East and Southern Africa. Only 3.4% has been developed (including 63% of North Africa's potential) so there is scope for hydroelectricity to meet growing industrial and urban demand in some parts of Africa (Lake & Souare, 2002).

Globally in 1950, only 12 countries with 20 million people faced water shortages (stress or scarcity) of some sort. By 1990, it was 26 countries (14 in Africa) and 300 million people (Lake & Souare, 2002; Nash & DeSouza, 2002). Nash and DeSouza (2002) estimate that 25 countries in Africa will face water stress or worse by 2025 (Figure 13.6).



Source: UNEP (2000) with permission, UN.

Note: Mauritius and the Cape Verde islands would face water scarcity; Comoros would be water-stressed (islands not shown).

Figure 13.6: Twenty-five African countries will face water stress or scarcity by 2025

Up to 65 countries (32 in Africa) will face shortages by 2050 – after which the world's population is expected to stabilize (Lake & Souare, 2002). While water storage in North America averages 6,150 m³/per capita, in Sub-Saharan Africa, it can range from as low as 43 m³/per capita in Ethiopia to as high as 746 m³/per capita in South Africa – the most developed country on the continent (Deen, 2005).

The main conflicts in Africa during the next 25 years could be over that most precious of commodities – water – as countries fight for access to scarce resources. Potential “‘water wars’” are likely in areas where rivers and lakes are shared by more than one country, according to a United Nations Development Program (UNDP) report (Smith, 1999). The possible flashpoints are (Smith, 1999; Shiner, 2005) the Nile River Basin, the Niger River Basin, the Volta River Basin and the Zambezi River Basin.

Population growth and economic development will lead to nearly one in two people in Africa living in countries facing “water scarcity”, or what is known as “‘water stress’” within 25 years (Smith, 1999). The UN proposes monitoring worldwide reserves of drinking water and establishing agreements for the use of water (Brown, 2001).

13.11.1 Nile Basin Water Conflicts

"One day, every last drop of water which drains into the whole valley of the Nile... shall be equally and amicably divided among the river people, and the Nile itself ... shall perish gloriously and never reach the sea". (Winston Churchill, 1908 *In: Pottinger*, 2003).

“Shared water resources can lead to tensions between countries, as in the Nile Basin and elsewhere” (Commission for Africa, 2005).

The Nile is the longest river in the world, stretching 6,650 km (4,130 miles) from its sources in equatorial Africa to the outlet in the Mediterranean. The Nile collects and disperses water in 9 (10) countries: Burundi, Congo (the Democratic Republic of Congo), Egypt, Kenya, Rwanda, Sudan, Ethiopia (Eritrea), Tanzania and Uganda (FAO, 1997b). The river has two major sources: from Lake Victoria, the White Nile flows through Uganda and into Sudan where it meets the Blue Nile at Khartoum, which rises in the Ethiopian highlands. From the confluence of the White Nile and Blue Nile, the river continues to flow northwards into arid Egypt and on to the Mediterranean Sea. The Nile Basin covers an area of around 3 million km², or nearly 10% of the land mass of the African continent. It is home to 160 million people, of which four of the countries are “water scarce” (Egypt, Sudan⁵⁶², Ethiopia, Eritrea) and has for years been a global hotspot for potential conflict over water resources (Pottinger, 2003). About 85-86% of the Nile’s water comes from Ethiopia and the Blue Nile (Dawoud, 2001; Thomson, 2005a).

The sum of the irrigation potential of all countries in the Nile Basin (Egypt, Ethiopia, Sudan, Uganda, Rwanda and Burundi, Tanzania, Eritrea, Kenya and the Democratic Republic of Congo) leads to a water deficit of over 26 km³/year (without considering possibilities of reusing water as indicated by Egypt and Sudan in their water balance), but only after deducting the water “losses” in the Sudd region (FAO, 1997b) (see Chapter 7, Section 7.10.5.4, Nile River, Aswan High Dam).

As far as large scale irrigation dams are concerned, these dams have a poor record, having fallen short of physical targets, having failed to recover their costs and having been less profitable than expected. Evaporation of huge amounts of water, the salinization and water-logging of agricultural lands, the displacement of

⁵⁶² Note: in Figure 13.6 Sudan is not shown as water scarce.

poor farmers and the landless and an increase in the gap between the “haves” and “have-nots” are all common problems with large irrigation schemes (Pottinger, 2003). It is likely that min-barrages maybe linked to small-scale hydro programs and rainwater catchment programs may reach out to the rural poor better than these *grandiose* plans (see Chapter 5, Section 5.12.1.3, Irrigation potential and Chapter 7, Section 7.10.5.2, Gambia River and Section 7.12, ALTERNATIVES TO LARGE DAMS).

Another problem is energy dependency from hydropower. Already, ten of the Nile Basin Initiative (NBI) member states are dangerously hydro-dependent, including Burundi (98.4% of its electricity comes from hydropower), the Democratic Republic of Congo (99.7%), Ethiopia (94.2%), Kenya (73.9%), Rwanda (97.6%), Sudan (70.6%), Tanzania (86.2%) and Uganda (99.6%).⁵⁶³ Climate change experts believe that dry parts of Africa will see reductions in precipitation. In the Nile Basin, according to the Intergovernmental Panel on Climate Change, there has been a reduction in runoff of 20% between 1972 and 1987 linked to declining precipitation (Pottinger, 2003). This causes concern for the creation of more dependency on hydropower in addition to the fact that the poor of these countries do not benefit from this source of energy. It is likely that hydro-dependent countries will need serious efforts to improve the efficiency and diversification of their energy supply, especially by developing new renewable sources (e.g., solar, wind, geothermal) – not just an interconnected grid as proposed (Pottinger, 2003) (see Chapter 7, Section 7.12, ALTERNATIVES TO LARGE DAMS), such as a southern African grid linked to the US\$ 6 billion Grand Inga hydroelectric project on the Congo River in the Democratic Republic of Congo, expected to generate 40,000 megawatts of electricity, three times as much as any existing hydroelectric dam and more than twice that of China's controversial Three Gorges scheme (Pearce, 2002).

⁵⁶³ Statistics on only eight of the ten countries provided

13.11.1.1 Historical setting of Nile River flow partitioning

Just after WWII, Egypt began speaking of water as a national security problem. The Aswan High Dam was completed in 1970 to give it a guaranteed reserve of 160 billion m³ of water. In 1959, Egypt and Sudan ratified (signed in 1929) the “Agreement for the Full Utilization of the Nile Waters” giving Egypt an annual allocation of 55.5 billion m³ (bcm)/year and 18.5 bcm/year for Sudan; the remaining annual flow of 10 bcm assumed lost through evaporation and seepage from Lake Nasser (Klare, 2001). This gave Egypt the right to 87% of the annual flow of the Nile, with the difference (13%) going to Sudan. It effectively approved Egypt’s construction of the Aswan High Dam that inundated 6,500 km² in Sudan. Ethiopia, where an estimated 85% of the Nile’s annual discharge originates, was not consulted (Pottinger, 2003). Britain signed on behalf of its colonies of Kenya, Uganda, Tanzania, Rwanda, Burundi and Ethiopia/Eritrea in return for the right of Britain to access the Suez Canal (Opala, 2004).

The agreement had one major flaw. It failed to allocate water to states upstream of them. The agreement compels upstream nations to notify Egypt and Sudan of any impending hydro projects along the Nile or its tributaries. Thus, Egypt will only give the green light if it is convinced that its interests are hardly disturbed by the proposed project (Opala, 2004).

After signing a peace treaty with Israel, Anwar Sadat declared that the “‘only matter that could take Egypt to war again was water’ ” (Klare, 2001). Sadat threatened to bomb water facilities in Ethiopia if it implemented a plan to divert some of the Blue Nile’s water to domestic irrigation schemes. Equally threatening comments were made in the 1980s by Egypt’s then minister of state for foreign affairs and later Secretary General of the UN, Boutros Boutros-Ghali, “‘The next

war in our region will be over the waters of the Nile, not politics' ” (Klare, 2001). The problem for Egypt is that most Egyptians (70 million) live in the Nile valley on 4% of the country's land that is dependent on irrigation of which over 95%⁵⁶⁴ of its water comes from the Nile River (Wallis, 2004). Egypt's population has doubled since the 1960s (Thomson, 2005a). Dawoud (2001) estimates that 95% of Egypt's population is packed into the fertile ribbon of land along the banks of the Nile and its delta. No water, no food and no life – this is Egypt's dilemma.

13.11.1.2 Increasing population, increasing demand

Between 2000 and 2050, the Nile Basin is projected to gain 300 million additional people demanding water for irrigation to feed these people (Klare, 2001). Others say the population will double in 25 years (Pottinger, 2003). These states will proceed to build long delayed dams and irrigation schemes. Projected global climate change and reduced flow in the Nile could exacerbate this competition over water as a scarce resource (Klare, 2001). The three principal countries of the Nile River Basin - Egypt, Ethiopia and Sudan - can each increase its take from the river only at the expense of the other two. With the combined population of these countries projected to climb from 167 million today to 264 million in 2025, all three face growing grain deficits as a result of water shortages (Brown, 2002).

Although military conflicts over water are always a possibility, future competition for water seems more likely to take place in world grain markets. This can be seen with Iran and Egypt, both of which now import more wheat than Japan, which was traditionally the world's leading importer. Imports supply 40% or more of the total consumption of grain-wheat, rice and feed grains in both countries. Numerous other water-short countries also import much of their grain. Morocco brings in half of its grain. For Algeria and Saudi Arabia, the figure is over 70%.

⁵⁶⁴ Note above, Dawoud (2001), Pottinger (2003) and Thomson (2005a) place Blue Nile contribution to total flow as 85-86%.

Yemen imports nearly 80% of its grain and Israel more than 90%. Thus, if the world is facing a water shortage, it is also facing a food shortage (Brown, 2001). On the other hand, Lester Brown of the Earth Policy Institute also raises the possibility of a global grain deficit, which could impact the long-term abilities of countries to import grain shortfalls (see Chapter 5, Section 5.3.1.2, Keeping up with future demand – global deficits of the 21st century).

Ultimately, it is believed that the only way to avoid conflict will be to establish a regional development plan like the 1920 “Central Storage Scheme” that would maximize water supplies of all parties concerned. This would entail the construction of additional dams and reservoirs on the upper reaches of the Nile where evaporation rates are lower, while reducing evaporation losses in a lower-level Lake Nasser, saving billions of m³/year of water. Some say the controversial completion of the Jonglei canal in southern Sudan, begun in 1978 and ending in 1984 as a result of civil war, could save billions of bcm's, though cutting through the papyrus swamps of the Sudd (Klare, 2001). However, this has (Rosenblum & Williamson, 1987) and would result in an outcry by conservationists.

13.11.1.3 Nile Basin Initiative (NBI)

Although the Nile Agreement is not legally binding, since it has been practiced for decades it has become customarily-binding. This is supported by experts in international law (Opala, 2004). Established in 1999, the Nile Basin Initiative (NBI) was devised to help reduce tensions and create a framework for equitable sharing and “cooperative development” of Nile water resources (Pottinger, 2003). Currently, Ethiopia uses only 1% of the river's flow, but has begun to update a 1964 plan by the U.S. Bureau of Reclamation, which proposed 33 irrigation and hydropower projects for the Blue Nile. All together, the dams and irrigation works

envisioned under this plan would decrease the flow of the Nile by 4-8 billion m³/year. In addition, it has been reported that Ethiopia is building numerous small irrigation dams, which, when combined, can also seriously reduce the river's flow. Kenya, Uganda and Tanzania have also expressed their desire for a more equitable agreement over use of the Nile's waters and have even asked for compensation from Egypt for its constraints on their development. Most recently, in 2003, Kenya threatened to pull out of the treaty, which Egypt's Minister for Water Resources and Natural Resources called "an act of war" (Pottinger, 2003; Opala, 2004). Ethiopia is angered that Egypt is using its political clout to stop donor investment in planned water projects. It feels that in Egypt water for food, as well as fruits and vegetables destined for Europe are at the expense of development in Ethiopia, a country with erratic rainfall living on food aid, while precious water is lost to Egypt (Thomson, 2005a). In recent times, former UN Secretary General Boutros Boutros-Ghali reiterates his concern that that military confrontation between the countries of the Nile Basin is almost inevitable unless they manage to share water equitably (Thomson, 2005b)

Concern has been raised in a paper prepared by Ugandan academics that,

" 'NBI is no doubt a top-down arrangement that is a partnership between the (East African) governments, donor institutions and the governments of the West...NBI may be said to be a conduit for huge infrastructure developments rather than a new strategy for development in the Nile Basin' " (Pottinger, 2003).

This includes (Pottinger, 2003):

- A 80-100 MW hydropower project at Rusumo Falls on Rwanda's Kagera River, as well as a ranking and feasibility study of all hydropower;

- Integrated Development of the Eastern Nile project (IDEN). Hydropower projects under IDEN include the Baro-Akobo Multipurpose Water Resources Development Sub-Project;
- An Eastern Nile Power Trade Investment Program;
- A hydropower and flood control project in Egypt;
- 45 projects in Ethiopia (including 12 hydropower and eight irrigation projects); including Merowe (estimated to displace 50,000 people) and Tekeze dams;
- Six projects from Sudan (two hydropower projects), including the Kajbar Dam; and
- Uganda's Bujagali and Karuma hydropower dam projects.

The Ugandan government has stated that its portion of the Nile has more than 2,000 megawatts of potential hydropower capacity and has expressed great interest in developing hydropower projects for both domestic use and export. The region's real powerhouse, Ethiopia, has an estimated 45,000 megawatts of "economically feasible" hydropower potential according to industry journals (Pottinger, 2003). The countries of Egypt, Ethiopia and Sudan, through the Eastern Nile Subsidiary Action Program (ENSAP), have agreed to cooperate in the areas of irrigation and drainage, as well as hydropower development and river regulation (Addis Tribune, 2005).

Critics of the NBI argue that the initiative has been a closed affair, involving the member states and the World Bank in decision making, while largely ignoring the voices of ordinary people whose livelihoods depend on use of the Nile Basin's resources (Pottinger, 2003). However, the World Bank in effect enforces the 1929 treaty. The World Bank will not give an upstream country money and a loan to build a dam unless it has an agreement with the downstream country (Wallis, 2004). As a result, the IUCN formed a parallel initiative, the Nile International

Discourse Desk. This is a loose coalition of NGOs and civil society groups with an office in Uganda, hosted by the IUCN to establish national discourses on the NBI. Its goal is to overcome the divisions between: 1) The governmental bodies and multilateral funding agencies behind the NBI and 2) Those citizens in the region who wish to be more fully engaged in decision-making about development in the Basin (Pottinger, 2003).

“The NBI would have a much greater chance of success if it did not repeat the mistakes of the past era of unconstrained dam-building, and if, in the end, it left a healthier Nile River – and Nile River communities – as a legacy”,

especially by going through a bottom-up multi-stakeholder consultative process rather than planning in isolation (Pottinger, 2003). Such programs could take advantage of the Nairobi location of the Dams and Development Project, a UNEP-sponsored group that is the follow-up program to the World Commission on Dams (WCD) (Pottinger, 2003).

Pottinger (2003) is concerned that building large dams will increase friction over the use of the Nile’s waters, along with the social and environmental implications of dams as described in Chapter 7, most of which are rarely mitigated. In early 2006, the Nile Basin is coming into the limelight. The depth of Lake Victoria is at a record low due to record low rainfall (45% of the cause) and the over-release of water by the Nalubaale (Owens falls built in 1954) and Kiira dams (Owens Falls 2 built in 2002) for hydropower (55-60% of the cause) at Jinja where the lake enters into the Nile River (Pearce, 2006; Sunday Vision, 2006). At the end of 2005, Lake Victoria’s water level had dropped 1.2 m since 2003, the lowest level since 1951. Uganda has been releasing more water than the “Agreed Curve”, between Uganda and Egypt that intended to ensure that releases through the dams corresponds to the natural flow of the Nile river before damming (IRN, 2006b). This is having adverse impacts on electricity supplies in Uganda and raises concern over relying

too much on hydropower in the Nile Basin, with the potential for increased conflicts between countries over control of water flows for such purposes.

13.11.2 Lesotho Highlands

In 1998, the Lesotho Highlands Water Project is believed to have helped set off southern Africa's "first water war". In September 1998, in the name of restoring order from public protests against the government, South African troops invaded Lesotho. It is believed that the real reason behind this invasion was to assure protection of the Lesotho Highlands Water Project (see Chapter 7, Section 7.6.1, Lesotho Highlands Water Project (LHWP), the key to providing water to the greater Johannesburg/Pretoria region of Gauteng.

"When the shooting was over, 17 people had been killed near the project's Katse dam and many more had died fighting in the capital, which was left in ruins. South Africa's Star newspaper stated: 'Protection of the dam and its pipeline supplying (the region) with water was a top priority of the occupation forces' " (IRN, 2005).

13.12 CAPITALISM WITH A CONSCIENCE

" 'We are sometimes perceived as arrogant, top-down, non-participative polluters, more interested in providing cheap energy to developed nations than fostering long-term prosperity elsewhere. Because the scale of our operations can dwarf entire national economies, we have been criticized for failing to use that clout as an instrument for positive change,' " (International Association of Oil and Gas Producers, 2002 *In: Gary & Karl, 2003*).

Communism/socialism failed. However, it can be argued that capitalism, as it is practiced today, is failing the developing world just as badly as communism, since pure capitalism is based on maximizing your profits at all costs and has no

morality. We need “Capitalism with a Conscience” in this Global Society. Stiglitz (2002) and Sachs (2005) call it “Globalization with a Human Face”. Guest (2004) refers to such concepts as “Corporate Social Responsibility” to assure that what the private sector is doing addresses environmental and community issues, not just focusing on maximizing profits.

Madsen (1999) argues that up until now “trade not aid” policies with Sub-Saharan Africa have meant inexpensive labor for U.S. manufacturers under a new system of mercantilism competing against cheap labor markets in Asia.

Stiglitz (2002) argues that there are a number of capitalist or market models beyond that of the American model, such as the Japanese, German and Swedish models with comparable per capita income, but with lower inequality, less poverty and unemployment and better health care. These need to be compared against the American model. They are a far cry from the deregulated models preached by the IMF and U.S. Treasury for the rest of the world. Recent scandals with Enron, Arthur Anderson, and Merrill Lynch in America’s banking and corporate system certainly demonstrate the dangers of “unfettered and unregulated markets”, and the need for government regulation to hold the private sector accountable for its actions (Stiglitz, 2002). The recent scandal of Riggs National Bank laundering money for corrupt oil companies and government officials from Equatorial Guinea, as well as possible laundering of money from Saudi Arabia that may have been used to finance terrorism is another case in point (see Section 13.10.1.1, Oil, corruption, multi-national complicity & backwardness in Equatorial Guinea). Each country will have to find its own brand of capitalism that can be used to drive its economy and the above models may help in finding the appropriate way forward.

In the future, those willing to invest in Sub-Saharan Africa must take a long-term perspective towards the continent's natural resources and its people. Investment in Sub-Saharan Africa to take advantage of slave labor and poor or no environmental pollution controls cannot be the impetus for investment. In a presentation to the U.S. House of Representatives, Committee on International Relations and Subcommittee on International Economic Policy and Trade, Scott (1999), of the U.S.-based Economic Policy Institute, raised the need to address these issues that, in turn, were impacting American jobs going overseas. Stiglitz (2002) calls it the development of a "social contract" between citizens and their government and we can add in the private sector (local and international) that assures some fairness in helping assure that the poor share in the gains of society as it grows and that the rich share in the pains of society in times of crisis. "Trickle-down economics" (benefits of growth trickle down to the poor) of the Reagan-Thatcher era has not gotten to the poor in America, let alone the developing world (see Chapter 12, Section 12.1.1 Historical Perspective, Section 12.3, STRUCTURAL ADJUSTMENT, IMF AND THE WORLD BANK, Section 12.3.1, IMF and the World Bank and Section 12.3.4, Structural Adjustment, U.S. Movement to Control Developing Economies). Stiglitz (2002) believes what is needed are "pro-poor" or win-win policies that reduce poverty as they promote economic growth. The private sector has an important role in seeing such policies realized.

The private sector can make a profit, but it must strive towards creating a middleclass and conserving the environment. This was spelled out in recommendations by the African Oil Policy Initiative Group (AOPIG) to the U.S. Congress

"The U.S. should not be partnering with unpopular, undemocratic regimes. On the contrary, proper foreign policy would bolster American values with our allies and encourage democratic

development. One way to achieve this is to engage with energy-producing countries in a way that fosters and encourages the development of a middleclass, rather than allowing petro-dollars to flow into the hands of a small number of corrupt leaders and their associates" (AOPIG, 2002).

AOPIG went on to say, "African oil is not an end, but a means: a means to both greater American energy security and more rapid African economic development" (AOPIG, 2002).

Otherwise the bleak predictions, based on the faceless enemy of terrorism with no clear cut battle front, will jeopardize our quality of life globally, fueled by the anger and frustration of the impoverished masses. While the big stick – a military response to this problem – may seem like the obvious solution (e.g., as in the Niger Delta), as Alan Savory proclaims (see Section 13.3, CAPITALISM WITHOUT A CONSCIENCE), this is dealing with the symptoms, not the causes of the problem; poverty, repression by undemocratic regimes and a feeling of hopelessness for a better quality of life expected by many as they see how the other sides lives on CNN as a result of improved communications associated with globalization.

In the 1960s, America was faced with a threat to its way of life with its policies on segregation. This was primarily contained in the inner cities. The principal author can remember when African Americans in the inner city of the nation's capita Washington, D.C. were screaming "Burn Baby Burn". Going to the Maryland/Washington D.C. line at Westmoreland Circle on Massachusetts Avenue – which led through wealthy suburbs in both Maryland and D.C., past the stately National Cathedral, through "Embassy Row" and eventually into the poor inner city – one could see black smoke bellowing up from behind the Cathedral. The inner city was burning down. The inner city had come to a flashpoint where many did not care whether they lived or died. America realized that this frustration could spill over into the tranquil well-healed suburbs and an entire way

of life could be jeopardized. America realized that repression of people within a country, which purported “Freedom”, while “separate but equal”, could not continue. Though a minority, the African-American community was a significant minority, which white suburbia could no longer suppress nor live at the expense of. America found the way forward in a non-violent way, though major hurdles still exist in overcoming the socio-economic problems of the inner-cities – “caldrons ready to boil over”. The November 2005 riots across France by frustrated lumpen youth of North and Sub-Saharan African decent, jeopardizing everyday life, is another example of reaching such a flashpoint.

It is believed that what happened in Washington D.C. in the mid-1960s has become a global issue, which, until 911, most Americans and the West in general were insulated from. 911 changed this. Though being insular, it is not clear that most Americans, let alone Westerners, realize what is going on beyond their borders and the level of repression, poverty and frustration that most people experience in their daily lives. Many see this outward manifestation of anger and hatred towards the West as purely the actions of a minority fringe group of terrorists that must be dealt with in a Biblical manner, “an eye for an eye and a tooth for a tooth”. Most fail to see that, though the majority of the poor, marginalized and repressed in the rest of the World would never consider such violence, the masses on the other hand also did not completely condemn these actions. One must understand that 911 was an extreme reaction towards the exploitation of the Third World by the First World, but which must be considered as an outward display of the anger and frustration towards the West and the hopeless predicament of the majority of our global society.

Certainly, no one can condone the terrorist expression by a small, but growing group of fanatics that could be in the tens of thousands, but still are a minority of our global society. Chua (2003) describes how an elite ideological minority fan

the embers of the frustrated majority “World Hutu”, to use them as pawns in terrorism (see Section 13.3, CAPITALISM WITHOUT A CONSCIENCE). While a minority using a majority (the world’s poor and disenfranchised masses) drives terrorism, it must be considered symptomatic of a sickness in our global community, which must be overcome.

The sickness, as already discussed, is poverty, repression and hopelessness in much of the developing world by the majority of its citizenry, a form of “Global Apartheid” in which a minority in the West are living lifestyles at the expense of the developing world; something which is not sustainable in the long run. Much of this can be linked to poor and repressive governance, as well as the lack of resource and land tenure that prevent people from controlling their own destinies. The West and the Private Sector can play an important role in helping to overcome this sickness.

If the West wants to use its technologies to exploit the resources of the Third World, then we must demand that wealth generated from this exploitation is reinvested into health, education and infrastructure, and that democratic processes are in place to allow the voice of the people to be heard. We must help create middleclasses on the African subcontinent, based on private sector driven economies linked to the sustainable use of and added value from transformation in Sub-Saharan Africa of its natural resources – not donor driven resources where 70-90% of the money goes back to the donor country (see Chapter 11, Section 11.7.2, Foreign Assistance Conditionalities Good Business for Donor County Not Recipient/Host Country). There must be accountability and transparency demanded by the West from Sub-Saharan Africa’s leaders as to what happens to this wealth.

“The corporation is responsible first and foremost to the law. Some would argue that this is as far as a corporation must go. Milton Friedman argued in the 1960s that within the law ‘there is one and only one social responsibility of business – to increase its profits.’ Today this is more a benchmark reflecting subsequent progress than a commonly shared view. No international business leader would publicly profess these views today. Companies are usually not the villains that detractors may wish to portray. Many corporations recognize the extent of their impact and push to make this positive. The result is a new type of ‘social contract’ that includes society’s expectations and rights regarding corporate operations and the obligations of the corporation toward society. Many American and British multinational corporations now face the situation where 90% of their shareholders are in the U.S. or UK, but most of their turnover, employees, fixed assets, operations are in other countries. Social responsibility does not have to be entirely altruistic, for there are opportunities in doing good that positively affect the first bottom line, such as increased employee pride, better relations with local communities, and a more stable, prosperous future. A results based framework to measure the non-financial bottom line would look for contributions in areas such as social practices, economic, human and community development, as well as environmental sustainability. Human development indicators and tangible improvements in quality of life could be measured to demonstrate results. For example, a firm could possibly point to increased literacy or rising incomes in the areas where it operates as signs of positive impact” (Dietrich, 2000 *In: Cilliers and Dietrich, 2000*).

Clem Sunter is Chairman of the Anglo-American Chairman’s Fund in South Africa, as well as a scenario planner and author of a number of books on looking at future scenarios for Africa, South Africa and the world, including his latest book, *The Mind of A Fox* (Ilbury & Sunter, 2002). He wrote George W. Bush a letter explaining that while globalization has uplifted the world, it has widened the gap between winners and losers, resulting in resentment. It is this relative deprivation – as opposed to absolute deprivation – which causes resentfulness. There is no doubt that the big winner since globalization in the late 1980s is America – you could almost call it “Americanization”. The ease of obtaining nuclear weapons makes conventional weaponry unimportant, changing the rules

of warfare and making the bombing of the World Trade Centre merely an aperitif to what may come if the terrorists are totally ruthless. Nuclear bombs nowadays are so small they can be mailed, shipped or flown into a country (Gibs News, 2003).

There is a general disintegration of world order resulting from the growing gap between winners and losers. All the old religious and ethnic hatreds are coming to the surface again around the world because when you lose, you look for something to inflame the masses with. Isolationism will only create a more divided world than we already live in today (Gibs News, 2003).

America can try to isolate itself so that terrorists and illegal immigrants can not enter, or they can go after the perpetrators that are wanted dead or alive. The alternative is a Friendly Planet, where America takes the lead to overcome the dysfunctional world we live in today. The most important victory over terrorists is trying to put a more human face on globalization, creating a different kind of world that is not win-lose, but win-win (Gibs News, 2003).

Africa and the world can only hope that more of the international private sector and Western governments begin developing the attitude put forth by Anglo-American towards Africa and its people, demanding accountability from Africa's leaders as to what they do with the wealth that the West helps them extract using Western technologies. Hopefully this will be reinvesting the wealth back into the people and infrastructure, such as the 400 or more students sent to South Africa's universities by Botswana, using money accumulated from mostly diamond mining. Then Africa will change for the better.

13.12.1 “Publish What You Pay” an Attempt at Developing Transparency in Distribution of Wealth from Africa’s Natural Resources

“Rich nations should put in place a series of measures to make theft of national assets more difficult and to deter their own companies from paying bribes in the first place. After all as the former Zairian dictator President Mobutu Sese Seko once reputedly said: ‘It takes two to be corrupt – the corrupted and the corrupter’ ” (Commission for Africa, 2005).

“U.S. oil companies should be encouraged, perhaps through tax incentives, to disclose all payments to the oil producing governments. Diplomatic pressure should be brought to bear to encourage other countries to require such reporting of their energy companies as well” (AOPIG, 2002).

The British Department for International Development (DFID) has convened a forum called the Extractive Industries Transparency Initiative (EITI), which is poorly resourced and relies on voluntary reporting by companies and governments. The 2003, declaration of the G-8 summit in Evian suggested a voluntary approach to promoting transparency in the extractive sector. However, a voluntary approach will not work in the majority of countries because political and business elites currently have a vested interest in avoiding transparency (Global Witness, 2004). Although in its early days, in principle, Nigeria, Ghana, the Republic of Congo and São Tomé e Príncipe have signed on to the EITI (Commission for Africa, 2005).

Furthermore, there is a need for the West to become involved in helping to

“track down money looted by corrupt African leaders, now sitting in foreign bank accounts, and send that money back to the states from whom it was stolen...The UN Convention Against Corruption – the first international legal instrument to recognize the need for all states to commit to asset repatriation – has not been

ratified by one single member of the G-8. It can come into force only if it is ratified by 30 states. It is pointless for the developed world to bemoan African corruption when it does not take the specific measures needed to counter it" (Commission for Africa, 2005).

Relying on companies to disclose information voluntarily has so far failed because they fear discrimination by host countries and competitive disadvantage (Gary & Karl, 2003). For instance, when British Petroleum (BP) wanted to disclose payments to the government in Angola, it immediately faced the threat of losing its license to less scrupulous competitors (Global Witness, 2004).

Launched in 2002, "The Publish What You Pay" coalition of more than 190 Northern and Southern NGOs is calling for legislation to require extractive companies to disclose their payments to all governments. This would help citizens in resource-rich-but-poor countries to hold their governments accountable over the management of revenues (Global Witness, 2004). Major human rights and development groups, such as, Catholic Relief Services,

"Human Rights Watch, OXFAM America, Save the Children, Global Witness, the Open Society Institute and others have joined local groups in producing countries in calling for mandatory disclosure of payments. The UNDP and the World Bank's IFC (International Finance Corporation) have endorsed the concept in principle. A group of European investors representing \$650 billion has called on oil and mining companies to be more transparent in their revenue payments" (Gary & Karl, 2003).

"One approach would be for stock market regulators to require oil, gas and mining companies to publish net taxes, fees, royalties and other payments to all national governments as a condition for being listed on international stock exchanges and financial markets" (Gary & Karl, 2003).

Conditions precedents for foreign assistance [see Chapter 11, Section 11.7.1.1, Overseas Development Assistance (ODA) versus Overseas Assistance (OA)] from public and private sources should require a full disclosure of income by the borrowing country, including loans from the World Bank and IMF (Global Witness, 2004). This would level the playing field by requiring all companies to follow the same procedures, creating transparency by invalidating secrecy clauses in contracts that would no longer be valid. Ultimately, since all companies would be required to follow the same reporting procedures, threats by corrupt government officials to cut, not renew or award contracts, would be largely negated (Transparency International, 2003; Global Witness, 2004).

Without transparency, there can be no accountable government and efforts to ensure that resource revenues are well spent will likely fail, with the effect of deepening poverty, instability, conflict and state failure. It is time for companies and governments to come clean on the revenues generated by natural resource exploitation (Global Witness, 2004). It is high time that the private sector and the global community help create transparent conditions to help assure that the wealth they help generate does not end up as capital flight into Swiss bank accounts for a few elites, but goes back into developing Sub-Saharan African countries and their people.

13.12.2 Chad-Cameroon Oil Pipeline a Possible Model

The African Subcommittee (U.S. Congress) held a hearing in 2002 to look at the 1,070 km Chad-Cameroon pipeline project, which at US\$ 3.7 billion is the largest investment in Africa. This compact between energy companies, the World Bank, the two governments and civil society aims to ensure that oil revenues actually benefit local citizens (Royce, 2002). The World Bank lent Chad US\$ 37 million to help build the pipeline from its Doba Basin oil fields (Junger, 2007). As of

2006, Chad is a relatively small producer (Gollust, 2006) at around 170,000 bpd and over the last three years has received around \$400 million in oil revenues (Bavier, 2006). It is estimated that Chad will receive around US\$ 2 billion over the lifetime of the oil fields (Brottem, 2004). This has been facilitated by private enterprises operating in Chad, where in October 2003, Chad's President officially inaugurated the start of oil production along with a prototype for revenue management from the Chad–Cameroon Petroleum Development Project.

“Working with the World Bank, major oil companies and NGOs, Chad’s government has created a framework for putting revenues into an escrow account subject to public disclosure and audit and with specified percentages agreed for debt repayment, future generations and development projects. The process will be monitored by an oversight committee including government officials and civil society organizations” (World Economic Forum, 2004).

To date, results have been mixed, but the real test began in 2004 when oil revenues more than doubled Chad’s national budget overnight (Gary & Karl, 2003). Chad has passed a Petroleum Revenue Management Law

“that provides for clear and transparent rules for allocating oil revenues, as well as for civil society participation in the Oil Revenues Control and Monitoring Board” (Transparency International, 2003).

However, the pipeline project has been

“sharply criticized by environmental groups such as the Washington-based Environmental Defense Fund. There is growing anxiety that President Idriss Déby,⁵⁶⁵ whose arbitrary rule is

⁵⁶⁵ Dictator “Déby took power by overthrowing another notorious dictator, Hissène Habré, who left behind mass graves that rival those of Iraq and Bosnia and systems of torture, including grotesque mutilations of living prisoners, that stand out even among his peers. Habre, who received hundreds of millions of dollars in U.S. military aid during his eight-year rule, sits in

worrying regional allies and foreign investors, is determined to control the revenue from the project, which is expected to generate as much as 250,000 barrels per day" (Transparency International, 2003).

Likewise, in mid-2005, Amnesty International (2005) challenged Chad, Cameroon and the consortium led by ExxonMobil to assure that agreements between governments and the private sector could in no way be interpreted to bypass human rights based on international standards, such as the Universal Declaration of Human Rights and the African Charter on Human and Peoples Rights.

The Catholic Relief Services (Gary & Karl, 2003) believes that other actors besides African governments must play a vital role to assure this wealth is not squandered, including: foreign oil companies, International Finance Institutions (IFIs) like the World Bank and the International Monetary Fund (IMF), Export Credit Agencies, the U.S. and other Northern governments.

"Especially since World War II, multinational energy corporations, their home governments, and International Finance Institutions have powerfully shaped the global environment in which countries with oil must operate. This is true in Africa today" (Gary & Karl, 2003).

Thus, they have an important role, if not moral obligation, in assuring that the wealth they help generate is reinvested wisely in the development of the African continent. By 2006, the World Bank had frozen oil money to Chad, alleging that it had failed to meet its obligations to channel much of this income to poverty alleviation (Associated Press, 2006; Gullust, 2006; Junger, 2007).

luxurious exile in Senegal, under the protection of other Big Men who have refused to exert any pressure to have him tried for his crimes" (Farah, 2006).

“Ten percent of revenues were to be held in a trust fund for future generations. Eighty percent of royalties and 85 percent of dividends were to pay for education, health, rural development and infrastructure and environmental projects. Five percent of royalties were destined for reinvestment in oil-producing areas” (Bavier, 2006).

Sudan, with money from selling oil to China for about US\$ 2 billion/year, was spending 80% of this revenue in buying Chinese weapons, while backing the Chadian rebel group, Front Uni pour le Changement (FUC).⁵⁶⁶ Given World Bank limitations on Chad’s use of oil revenue, Sudan was outspending Chad on military purchases at 50 to 1. By October 2005, Déby declared his abandonment of the World Bank loan agreement (Junger, 2007).

Idriss Déby’s “first purchase with the oil money was weapons worth US\$ 4.5 million for his security apparatus” (Farah, 2006),

as the people of Chad have become poorer moving from eight to last in 2002 to the bottom five today on the UN Human Development Index (HDI) (Bavier, 2006).

“In April, lender countries agreed to an interim deal with Chad that will allow 30 percent of oil revenues to go directly to government coffers” (Bavier, 2006)

making one wonder if the people living under such a dictatorial regime, literally fighting for its survival, ever will really benefit from such wealth. Meanwhile, Déby changed the constitution to run for and was elected to a third term in May 2006, while under attack from opposition/rebel forces.

To date, “Chad has never experienced a non-violent transfer of power” (Bavier, 2006).

⁵⁶⁶ In December 2006, FUC signed a peace agreement with the Chadian government, though other rebel groups fight on.

In 2003, the International Finance Corporation and a group of leading commercial banks launched the “Equator Principles”, where banks require their borrowers to meet social and environmental criteria before approving project finance loans over an agreed level (World Environmental Forum, 2004). Once again, while this sounds good on paper, Chapters 9 and 10 discuss the misuse of modern technologies, such as dams and sewage, many times after extensive environmental and socio-economic studies; the World Bank and USAID being some of the biggest culprits. The agreements above are only as good as the people and organizations that stand behind them. In the current settings, promotion will have to be based on positive social and environmental achievements and not entirely on corporate profits or among donor bureaucracies moving funds at all costs as a means of climbing the ladder.

For the first time according to Shiner (2004a), multi-nationals may be held accountable for their actions:

“In March, a U.S. federal judge ruled that two Chevron Texaco corporations might be held liable for the acts of their Nigerian subsidiary. In 1998, Nigerian military and police hired by the subsidiary allegedly killed a number of unarmed Nigerians protesting Chevron’s environmental and business practices”.

Creating transparent accountability will minimize such actions and hold those accountable who misuse Africa’s wealth to their own ends or against their people as opposed to developing the continent.

13.12.3 Role of Private Sector versus Foreign Aid in Economic Development

“ ‘African countries have been independent for the last 40 years. None of the Black African countries has transitioned from Third World to the First World, like Singapore, for example, has done.

Yet in 1965, Uganda was more advanced than Singapore. One of the reasons for this stagnation was interfering with the private sector by the African regimes in the 1960s and 1970s...Can state agencies reliably produce wealth? The answer to these questions has got two parts: the state cannot produce wealth because bureaucrats have no vested interest in the success of the enterprises; and it is only the private sector, because of their vested interests, that can reliably and sustainably, produce wealth' " (President of Uganda, Yoweri Museveni *In: Geyer, 2005*).

Key policy dialogue has raised the importance of moving away from heavy dependence on foreign aid and the stimulation of economic growth and development through the private sector. At an American Enterprise Institute conference in 1994, a number of key figures spoke out on this issue.

Richard L. Armitage explained, “ ‘...today’s major aid questions, such as the development of national economies or the transition from state control to the market, are not something that developmental specialists at (US)AID – trained in the economic theories of the 1960s and 1970s – are well equipped to handle...Whether administration officials know it or not, they are in a perfect position to redefine foreign assistance⁵⁶⁷ by refocusing on basic human needs and humanitarian emergencies, while placing the American private sector in the leading role in promoting economic development around the world.’ ”

Richard E. Bissell, member, independent inspection panel, World Bank believed that, ‘....One thing foreign assistance should not do is get in the way of the private sector....’

Thomas P. Sheehy, Jay Kingham Fellow in International Regulatory Affairs, Heritage Foundation believed that, ‘...U.S. aid program should be geared toward one major end: encouraging economic growth...economic growth most often comes from assisting the private sector and avoiding the usually corrupting influence of the state...Transitional programs designed to encourage economic growth allow us to step away from one of the big problems of such assistance: continued dependency and the

⁵⁶⁷ (see Chapter 11, Section 11.7.1.1, Overseas Development Assistance [ODA] versus Overseas Assistance [OA])

sense of donor obligation...we need to acknowledge that a great deal of our basic human needs programming has simply failed...sustainable development has been identified as the heart of the foreign aid reform bill. There it is defined as broad-based economic growth that reduces hunger and poverty, protects the environment, enhances human capabilities, upholds democratic values, and improves the quality of life for the current generation while preserving that opportunity for future generations...lineage of sustainable development is quite disturbing. It has been described—accurately, I would say—as a euphemism for environmental socialism...' " (AEI, 1994) or donor handouts.

"Today there is no serious dispute that markets are required for growth, and that aid cannot work in the absence of markets. There is growing agreement that assistance cannot buy market reforms. All that an increasingly beleaguered band of aid defenders now claim is that foreign assistance may be useful if extended to governments which have already adopted good economic policies" (Bandow, 2002).

13.12.4 The “High Road” versus the “Low Road”

Clem Sunter (1992) of Anglo-American identifies “eight” requirements for what he calls the “High Road” in helping the Third World develop:

- Triad (Western Europe, North America and Japan) shares ideas and technologies with the developing world rather than money (e.g., added value stays in Sub-Saharan Africa from adopting Western technologies that transform more of Africa’s raw products in Africa to take pressure off rural landscape and its natural resources through urbanization and industrialization, provide jobs, create an educated middleclass with an environmental conscience and stimulate the economy);
- Foreign aid only for catastrophes (e.g., floods, earthquakes, volcanic eruptions, cyclones, droughts, epidemics, etc.), infrastructure (especially hospitals and schools) and the environment – though the authors would argue that the environment would be better off if rural communities were

aided in sustainably using their natural resources through private sector initiatives they control in partnership with the West (turning them into economic resources for development as opposed to wasting Western taxpayers' money through NGOs who have no entrepreneurial skills and who live off this foreign aid), mostly at the expense of rural people and who tend to tie up the subcontinent's natural resources as opposed to valorizing them;

- Money should come from foreign investors – with poor countries competing for equity capital;
- Loans only to countries following certain globally approved policies of development (e.g., democratic process, rule of law, transparency in the use of income from natural resource extraction and transformation, etc.);
- Equality of Trade – Triad eliminates trade barriers as discussed in Chapter 12, especially for agricultural goods and textiles where Sub-Saharan Africa/developing world is competitive and Triad stops dumping subsidized agricultural products;
- Sound international monetary system;
- Arms trade strictly controlled; and
- Balance economic development against environmental health – polluters pay.

Sunter (1992) goes on to raise concern, which one could argue is becoming a reality in 2005, that if the aging developed world, the “Rich old millions”, live in isolation from the “poor young billions” of the developing world, they risk to be invaded as South Africa, the United States and Europe are by the hopeless masses from the sinking economies of dysfunctional nation states. As discussed over the last three chapters, much of this dysfunction can be attributed to the historical and current relationships between the West (Triad) and Sub-Saharan Africa/developing world.

Sunter (1992) believes that unless the “High Road” is taken, the results could be world-wide economic collapse, anarchy, mafias, death squads and a thriving security industry – which appears to be more the case than not in today’s Sub-Saharan Africa to the point that the U.S. military is establishing military bases and developing military alliances across the continent to protect its interests, especially oil, and to fight what it calls “terrorism”. This is dealing with the symptoms rather than the causes of the problem and thus, will not “cure the disease” using military interventions in a failed attempt to solve socio-economic problems. Genocide in Darfur and Rwanda, ethnic cleansing in Kenya and 45,000 people dieing/month in eastern DRC are indicators of this “socio-economic disease” that must be addressed. Global disorder risks upsetting the movement of base metals, oil and other commodities impacting not only the economies of the developing world, but of the West, as well as their security as epitomized by 911. Handouts of “foreign aid” from the West will not work; rewarding failure and creating a dependency culture (see Chapter 11, Section 11.7, FOREIGN ASSISTANCE IN GENERAL and Section 11.12, TRADE NOT AID). Sunter (1992) suggests that the United Nations has become a Tower of Babel, with the developing world perceiving the use of the Security Council to impose majority rule on the World. The go-it-alone attitude of the USA in Iraq and the veto of the UN Security Council resolution condemning Israel’s assassination of Hamas leaders in early 2004 are not too far from this scenario. Sunter believes that we are at a crossroads.

13.12.5 Poor Track Record in Achieving United Nations “Millennium Declaration” Goals

Ultimately, the West, as much as Africa, will determine whether mankind takes the “High Road” or the “Low Road”. As a global society, we are all in this together and we will all sink or swim together. Which road shall we take? The

2004 report of the Global Governance Initiative (World Economic Forum, 2004) scores the efforts so far as very poor (Table 13.5):

The numerical scores range from a scale of 0 to 10 with a 10 indicating that the world—national governments, businesses, civil society and international organizations taken together—did everything needed during 2003 to be on track to reach the goals. A 5 indicates that the world did half of what it should have done in 2003 about achieving the goal. A 1 reveals little or no meaningful effort. A 0 indicates retrogression: that the activities of the international community during calendar year 2003 actually made the problem worse (World Economic Forum, 2004). If one was to score these issues for Sub-Saharan Africa only, the scores might be 1-2 points lower for each issue.

Table 13.5: How the world scored in achieving United Nations “Millennium Declaration” goals between 2000 and 2003; “10” highest score, “0” lowest score

Here is how the world scored in seven major areas for 2003 on a zero to 10 scale

Peace & Security	3
Poverty	4
Hunger	3
Education	3
Health	4
Environment	3
Human rights	3

Source: World Economic Forum (2004) with permission World Economic Forum.

The Millennium Declaration, signed at the United Nations Millennium Summit by the leaders of 189 nations (World Economic Forum, 2004) set the following Millennium Development Goals:

- **Peace and security:** free all peoples from the scourge of war, both within and between states, seek to eliminate the dangers posed by weapons of

mass destruction, take concerted action against international terrorism and end illicit traffic in small arms;

- **Poverty:** halve the proportion of people living in poverty by 2015;
- **Hunger:** halve the number of people suffering from hunger by 2015;
- **Education:** ensure universal primary education and gender parity in primary and secondary schooling by 2015;
- **Health:** stop and begin to reverse the spread of HIV/AIDS and malaria, reduce the under-five mortality rate by 67% (2/3rds) and the maternal mortality ratio by 75% (3/4s), by 2015;
- **Environment:** stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, implement conventions related to the conservation of biodiversity and halve the proportions of people without access to water and sanitation by 2015; and
- **Human rights:** uphold international human rights standards, with particular attention to the prevention of torture and ill-treatment, protection of the rights of migrants, employment and labor rights, the rule of law and access to information.

These goals are not being met throughout Africa, the Andean region and Central Asia (Sachs, 2005). This and previous chapters have clearly spelled out the role of Western countries, their donors, International Finance Institutions (IFIs) and their multi-nationals in creating economic decline, civil unrest and war over much of the subcontinent as a means of accessing cheap raw resources. The failure to share Western technologies with Sub-Saharan Africa in helping them transform their raw resources in Africa, and a failure to hold African leaders accountable for how Sub-Saharan Africa's wealth from these resources is invested as opposed to squandered, should be a major embarrassment to the "do gooders" of the West who have tended to turn a blind eye to such issues in order to maintain their

lifestyles and economies that depend on cheap raw products and energy. As expressed by Sunter (1992), the West's life styles are now in jeopardy due to the failure of the First World to hold Sub-Saharan Africa's/Third World leaders accountable for their actions and thus the backward slide of most Sub-Saharan African/Third World countries since independence with regards to the quality of life, lacking basic economic opportunities, infrastructure and basic social services such as education, health care, clean water and housing. Sachs (2005) feels that overcoming poverty and helping the developing world develop will do more to quell terrorism than addressing the issue mainly as a military one (see Chapter 11, Section 11.7.1.2, ODA).

13.12.6 “Fair-Trade” Versus “Free-Trade”

As discussed in Chapter 5, in Sub-Saharan Africa (SSA) agriculture accounts for 20% (1/5th) of the economy and employs 67% (2/3rds) of the labor force. As discussed in Chapter 12, subsidies, quotas and tariffs are barriers to free-trade used by the United States and Europe to protect their farmers and manufacturers. Ultimately, what some prefer to call “fair-trade” as opposed to one way “free-trade”, along with industrialization, will be necessary to alleviate poverty in Sub-Saharan Africa.

At the World Trade Organization (WTO) ministerial Doha Trade Round meeting in Cancun, Mexico, in September 2003, the most important negotiations dealt with expectations that Europe and the United States would reduce farm subsidies and open their agricultural markets to the developing world. They did not, nor did they by mid-2007. This was a failure of leadership by the powerful economies, revealing the weaknesses of an unfair global governance system (World Economic Forum, 2004). South Africa and Brazil led these negotiations with the West. This meeting was considered a failure and stalemate between the developed and developing worlds with regards to true economic integration. If this failure is

a harbinger of future relations between the West and developing world, humanity is in trouble and civilization as the West knows it today is in danger. The West can not continue to live off the backs of the rest of the World. A possible breakthrough in trade at the WTO Geneva meetings occurred in July 2004, though many NGOs see this as “smoke and mirrors” with little substantial change (see Chapter 12, Section, 12.2.4, Agricultural Tariffs and Subsidies). Time will tell as to what degree the West is really prepared to help in both trade and industrialization in Sub-Saharan Africa.

A recent report by the World Bank has down-played potential benefits to the developing world by 2015 compared to 2002, if all trade barriers (e.g., tariffs, quotas and subsidies – complete trade liberalization) were eliminated (Blustein, 2005):

World Bank projections of benefits to the developing world between 2002 and 2015 if all trade barriers eliminated

	<u>2002</u> <u>Projections</u>	<u>2015</u> <u>Projections</u>
• Increase in Global Income (US\$ billions)	832	287-461
• Developing Countries’ Share of Increased Income (US\$ billions)	539	86-200
• Reduction in Number of People with Income Below US\$ 2/day (billions of people)	320	66-95
• Reduction in Number of People with Income Below US\$ 1/day (billions of people)	110	32-43

Note: Shown as bar graph in original article

These World Bank projections take into account that countries receiving preferential trade could actually be worse off because of increasing competition (see Section 13.13.6.3, Other agreements). In addition, China’s entry into the global market is factored in, as well as a World Bank projection that there will be less people below the poverty line needing uplifting. Additionally, this implies that opening markets in Sub-Saharan Africa to the exportation of raw products, as is currently the case (see Section 13.13, TRADE NOT AID), while providing

some benefits, is not enough. Ultimately, Sub-Saharan Africa must transform its resources on the subcontinent prior to exportation.

If the status quo continues, most recent projections from Mark Malloch-Brown, head of the UN Development Program, are that Africa will not meet the goal of halving poverty until 2147, rather than 2015 (Schlein, 2004), if ever. What does this imply for soil and habitat degradation, Africa's people, the charismatic megafauna, the teeming slums of the urban cities and mass migrations into the industrial world? The West needs to help Sub-Saharan Africa in order to help itself.

13.12.7 Industrialization in Sub-Saharan Africa

Alemayehu (2000) argues that African industrialization is no longer debatable other than the strategies to be used. Without industrialization and resulting economic growth, the continued worsening of economic and social conditions will result in accelerated deforestation, over-grazing, desertification, destruction of biodiversity and uncontrolled and increasing pollution. Food aid and emergency relief ("giving people fish") in perpetuity is not sustainable, but providing Sub-Saharan Africa with appropriate technologies ("teaching them how to fish") (Alemayehu, 2000) is the only hope for the people and natural resources. René Dumont (1966) proclaimed,

"Without factories, an economy cannot get off the ground and effect rapid growth in labor productivity, nor can it provide for the massive demands of modern agriculture. Industrialization is also a symbol for economic progress, not a negligible factor in inspiring enthusiasm for development" (see Chapter 12, Section 12.9.1, Export Transformed Products; It's Not Rocket Science). He goes on to say, "industries during the change over will have to be backed by intensified agriculture if they are to develop. It will supply them with the raw materials of industry" (e.g., cotton, coffee, cacao, maize, fruit, peanuts, palm nuts and livestock), in addition to

petroleum, minerals, timber, fisheries and wildlife – the other key resources of the continent.

Similarly, Alemayehu (2000) argues to start development with the processing and manufacturing of agricultural inputs (e.g., pesticides, fertilizers and farm machinery) and outputs (crops and food processing). Thus to produce the raw products for industry, as discussed in Chapter 5,

“Africa will have to break out...of its infernal cycle of under-production, itinerant crop cultivation, long fallow periods (where possible), lack of fertilizers and reliance on manpower alone. By concentrating solely on industry one cannot solve the problem of rural employment for a good long time” (Dumont, 1966).

“Do Not Give the Needy Money: Build Them Industries Instead ‘When provided the industry, as opposed to the money to build industry (foreign aid and squandered loans), those people will have physical capital. The only profits to be made then are in production; there is no development money to intercept and send to a Swiss bank account’ ” (Smith, 2002 *In: Global Issues*, 2002).

Van der Laan (2002 *In: Zack-Williams, et al.*, 2002) believes that Africa exports too many “non-branded” primarily agricultural products and that it must look to exporting more “branded” manufactured and primary (e.g., sold under a brand name) products from the continent. This was also suggested at an African Trade and Investment Conference held in Gabon in early 1995 (*Washington Times*, 1995c *In: DeGeorges*, 1995), where African countries were encouraged to think in terms of producing goods instead of exporting raw materials to Europe and then importing finished products. It was also suggested that regional markets be developed where, for instance, Gabon or Niger can buy coffee direct from the producer Cameroon instead of importing it from France.

René Dumont (1966) argues that the above will be necessary for “economic decolonization and true independence”.

13.13 TRADE NOT AID

“Wealthy countries should allow trade with poor countries and poor countries should promote trade within and amongst themselves. Trade will lead to production that will lift the standards of living in poor countries. It is prudent therefore that: - Poor countries realize that aid is not ‘help’; it’s detrimental to development. Governments in poor countries (must) pay more attention to human effort and resourceful ingenuity by providing incentives:

- Urgently strengthen the regime of private and commercial property rights (for rural communities) (this could be ownership over land, coastal/shorelines, wildlife, timber and mineral resources) because prosperity and property are intimately linked.
- Enforce rights of contract, explicit and implicit.
- Put in place stable governments, government of laws, rather than the government of men. The rule of law promotes confidence in relations with others hence facilitating mutual exchange of goods.
- Give the poor a chance to choose and prioritize projects that are suitable to their needs by promoting a participatory strategy in project proposals and implementation.
- Focus on sound economic policies by avoiding approaches to aid that sustain central planning system that turns people into virtual serfs, working to fund the failed policies of the state.
- Empower the individuals to achieve economic prosperity.

For the poor countries to be able to empower their people to get food on their tables it is important that they put in place an environment that will make them productive. Such an environment cannot be created with continued bailouts to poor policies by governments that use aid to suppress its people forcing them to subsistence production” (Shikwati, 2002).

However, currently trade with Sub-Saharan Africa is decreasing.

“Total trade between the U.S. and Sub-Saharan Africa dropped considerably in 2002 (the year for which the most recent figures are available), with a decline in both imports and exports. Two-way trade amounted to about \$24 billion, or 15% less than the previous year.

While the 2003 figures are not yet available, it is clear that Africa has been negatively impacted by the worldwide economic downturn, as well as by the war in Iraq, and the continent's economic prospects will remain unstable in 2004" (Booker & Colgan, 2004) [see Chapter 12, Section 12.3.4.4 Trade and structural adjustment policies (SAP)].

"Currently, with the exception of a more diversified relationship with South Africa, U.S. imports from Africa and U.S. investments are both heavily concentrated in the oil sector. In 1996, 71% of U.S. imports from Sub-Saharan Africa were energy-related. That same year, oil producers Nigeria and Angola ranked 26th and 34th worldwide in the value of their total imports to the U.S. (ahead of South Africa at 38th) while oil producers Algeria and Gabon ranked 40th and 44th respectively" (FPIF, 2003).

There are a number of trade initiatives being developed between Africa and the West. An analysis by Meyn (2003), while aimed at the Southern African Customs Union (SACU) comprised of South Africa, Lesotho, Swaziland, Namibia and Botswana, applies to the rest of Sub-Saharan Africa. A general problem, which will be seen below with trade agreements between the U.S. and the European Union (EU) with Sub-Saharan Africa, is that other than industrialized South Africa, SACU/Sub-Saharan Africa export predominantly primary and low-skilled, labor-intensive goods, while importing high-skilled labor, capital-intensive commodities such as transport equipment and electronic products. Intra-industrial trade occurs only between South Africa and the EU and the U.S. respectively and comprises only a limited share of trade (Meyn, 2003). Thus,

"For aid-dependent low-income countries, mostly in Sub-Saharan Africa, their marginalization from financial markets means that they are deprived of any means to mitigate the effects of the significant decline in ODA (Official Development Assistance/foreign aid) they fell into in the early 1980s" (ILO, 2004) (see Chapter 11, Section 11.7, FOREIGN ASSISTANCE IN GENERAL). As a result, many of these countries are still, some two decades later, caught in the debt trap (see Chapter 12, Section 12.5, DEBT AND STRUCTURAL ADJUSTMENT POLICIES).

As will be seen under the Africa Growth and Opportunities Act (AGOA), South Africa is the main beneficiary to date from trade agreements with the West. For this to change, the West may have to go out of its way to bring technologies and training into the rest of the subcontinent as a part of trade agreements to overcome the injustices of the past which maintained Sub-Saharan Africa in a state of under-development (see Chapter 12, Section 12.9, THE WAY FORWARD).

13.13.1 Good Governance and Rule of Law Required for Trade

Meyn (2003) goes on to say that

“it seems doubtful whether the SACU countries will benefit from increased Foreign Direct Investment (FDI) and outsourcing activities of U.S.-firms when entering into an Free-Trade Area/Agreement (FTA) with the USA. As the experience with the EU shows, a contractual agreement with an industrialized country might improve SACU/Sub-Saharan Africa countries’ options to attract FDI but is not a sufficient condition. A prosperous selling market, a big pool of qualified labor, and political stability in the country and the region are judged as more important than an FTA with an industrialized country”.

Countries experiencing political instability are less likely to develop and to receive private investment (CBO, 1997). Similarly, the World Bank (2000) recommends that Africa address four crucial points if it is to “claim” the 21st century and the much needed FDI:

- 1) Improving governance and resolving conflict;
- 2) Investing in people (e.g., health and education);
- 3) Increasing competitiveness and diversifying economies; and
- 4) Reducing aid dependence and strengthening partnerships.

Another problem that Meyn (2003) identifies is that while SACU countries have advantages, such as cheap labor, good infrastructure and macroeconomic stability, countries peripheral to the U.S., especially Mexico and to the EU, namely Eastern Europe, have similar advantages and a closer distance to the delivery area. SACU countries are not able to compete with them, which to some degree is a disincentive to invest in Sub-Saharan Africa.

13.13.2 Transform Products Unique to Sub-Saharan Africa

Sub-Saharan Africa has many products that America and Europe need and/or desire, such as tropical hardwoods, cotton/clothes, coffee, tea, cocoa, many minerals (such as COLTAN), oil and wildlife, all of which Sub-Saharan Africa can begin transforming with Western technologies in Africa. For instance, taxidermy in South Africa is valued at between US\$ 10 million/year (African Advisory Board, 2000) and US\$ 28.6 million/year (NAMC, 2006), while in the Free State of South Africa, raw gold is being converted into jewelry prior to being sent overseas. If this occurred on a continent-wide basis, Sub-Saharan Africa's economies would jump in leaps and bounds. The South African "Promotion of Beneficiation Bill" will provide strong incentives to transform more of the country's minerals in-country in order to obtain added value that provides more jobs and stimulates South Africa's economy (Deliza, 2003). Another movement to help small farmers is "fair-trade Coffee" that assures small farmers an equitable share in the ultimate market value of coffee, US\$ 1 to the farmer when all the middlemen are cut out versus the typical US\$ 0.60 (OXFAM America & TransFair USA, 2004). Farmers are encouraged to grow "organic coffee" with a minimum use of pesticides and fertilizers. This could still go one step further with roasting, processing and packaging of the coffee in the country of origin (see Chapter 12, Section 12.9.1, Export Transformed Products; It's Not Rocket

Science). In fact, the day may come when Sub-Saharan Africa will have to pass laws prohibiting certain raw non-transformed products from leaving its shores.

UNECA (2004) concludes that “Africa needs to diversify out of agricultural and other primary products, and into sectors with a higher value-added”. This is beginning to happen (Table 13.6) (UNECA, 2004).

Table 13.6: Manufacturing as % of export trade for selected African countries, 1980-2001

	1980	1990	2001
Algeria	0.3	2.6	(2.3)
Angola	12.9	0.1	..
Benin	3.4	..	6.2
Cameroon	3.8	8.5	4.7
Comoros	23.8	..	8.2
Côte d'Ivoire	4.7	..	(14.5)
Egypt	10.9	42.5	32.7
Ghana	0.9	..	15.8
Kenya	12.1	29.2	(20.8)
Mauritius	27.4	65.8	74.2
Morocco	23.5	52.3	(64.1)
Nigeria	0.3	..	(0.2)
Senegal	15.1	22.5	28.8
South Africa	18.2	21.9	59.4
Togo	10.6	9.1	49.7
Tunisia	35.7	69.1	(77.0)
Uganda	0.7	..	6.9
Zambia	16.0	..	12.7
Zimbabwe	35.8	30.9	(28.1)

Note: Figures in italics refer to data for 2000.

Source: UNECA (2004) with permission, UN.

While “trade, not aid” is the general motto for the relations between developing and industrialized countries (not only of the current U.S. government), improved market access will not be enough to integrate the SACU/Sub-Saharan African countries into the world economy. Assistance will be required in the areas of

customs procedures, capacities, finance, human capital, technical standards, etc., and as with the Trade, Development and Co-operation Agreement (TDCA) – with the European Union (EU), the SACU-USA Free-Trade Area/Agreement (FTA) should contain a strong development component. Contrary to the TDCA, the SACU-USA FTA should exclude subsidized agricultural products and open its market comprehensively for agricultural and labor-intensive products where the SACU countries have comparative advantages. Such a strategy would imply less self-interest of the U.S. Government and more commitment to development in SACU/Sub-Saharan Africa (Meyn, 2003).

13.13.3 Role of Government in Trade

Finally, Stiglitz (2002) believes that “free-market ideology” must be replaced with analyses based on economic science with a more balanced view of the roles of both governments and the private sector in driving economies. Even the U.S. Congress (CBO, 1997) in an assessment of foreign aid and development recognized the role of government in protecting fledgling industries until they are competitive in the world market as a means of spurring industrialization and economic growth. However, they concluded that unless the trade subsidies are gradually removed, the industry, due to its monopoly, will become less productive, producing inferior and more costly products for citizens and will become non-competitive in the international market place (see Chapter 12, Section, 12.7.1.6 Beginning of neo-colonialism). The World Bank (1998a) is at least “talking the talk” that,

“evidence suggests that rapid development is possible, and should be based on markets and on effective states playing an economically important facilitating, but not dominant, role”.

In other words, they are concluding that, unlike structural adjustment policies, there is an important role for government (as in the West), as a regulator (environmental and worker rights), monitor and as a facilitator. It is unclear whether the World Bank is “walking the talk” or not.

The long-term key for success of Sub-Saharan African development programs based on foreign investment will not be in the actual international agreements such as the African Growth and Opportunity Act (AGOA) or the New Partnership for Africa’s Development (NEPAD), but in the implementation of these agreements. Implementation must assure appropriate environmental controls in both the work place and the environment, as well as assure appropriate salaries given the cost-of living in a given country so as to create a working middleclass with comparable purchasing power to the North America and Europe, while not being so demanding that the private sector might as well stay at home due to insignificant profit margins (see, Section 13.6 ENVIRONMENTAL STRESS AND POTENTIAL CONFLICTS). In economic terms, these “costs of doing business” must be internalized by the private sector, not externalized. This must be based on negotiation and trust between stakeholders (e.g., the government, workers unions and the private sector). Institutions capable of monitoring and enforcing agreements will be critical to this success. Stiglitz (2002) explains that Singapore, China and Malaysia developed by using Foreign Direct Investment (FDI) to access markets and new technologies, but at the same time kept the abuses of the private sector in check and this is exactly what Sub-Saharan Africa must do. To go along with mirroring the “East Asian Miracle” there will need to be a major investment in education by African governments and state-directed industrial policy (as indicated above) with regard to worker and environmental issues.

Ultimately, FDI must be based on a contract with society that helps to overcome poverty, assures universal education, adequate healthcare, assures appropriate benefits to the worker, deals with the environment and pollution, builds the infrastructure necessary to develop markets, creates accountability and rule of law. In the end, it must help developing countries transform their societies, while retaining the distinct differences relative to their cultures and traditions. Stiglitz (2002) argues that where the interdependent world is going can only work if democratic globalization exists, where decisions are transparent and made multilaterally, as opposed to unilateral, with full participation of all the people of the world.

13.13.4 NAFTA, Maquiladora and the Environment, Lessons for Sub-Saharan Africa

In August of 1992, the governments of the United States, Canada and Mexico concluded negotiations on the North American Free-Trade Agreement (NAFTA). NAFTA came into effect on January 1, 1994. NAFTA was part of a wider package of neo-liberal policies and economic strategies pursued by the Mexican government during the 1980s and 1990s, such as privatization, reduction of government support for agriculture and tighter fiscal policies (Ghisso, 2003) [see Chapter 12, Section 12.3.4.4 Trade and structural adjustment policies (SAP), NAFTA Trade Agreement, a Benefit to Whom – Lessons for Africa].

NAFTA addresses environmental issues in its preamble and in five of its 22 chapters. Former President Clinton criticized NAFTA in the early 1990s for not dealing adequately with environmental issues and committed to negotiate supplemental agreements on both environment and labor (Hufbauer & Orejas, 2001). Although heavily criticized for its inadequacy, the original NAFTA,

negotiated under President Bush (Sr.), included environmental provisions (Auberbach, 1992).

Since its inception in 1965, the Mexico's Border Industrialization Program (*maquiladora* program) has grown to include over 3,000 plants, employing well over 689,420 people (TED, 1997). Most of the program's growth came after 1982 when Mexico's economy suffered severe disequilibria due to the debt crisis, a fall in basic commodity export prices and Balance of Payments (BOP) problems. Concomitant to the increase in the numbers of *maquiladora* plants was rapid population growth, over-development and environmental degradation (TED, 1993). The *maquiladora* program essentially allows foreign-owned and managed companies duty free imports of manufacturing equipment, tools, machinery and spare parts required for production into Mexico. The goods can then be exported to any country in the world with only a value-added tax assessed by the *maquiladora* industries -- which seek to profit by using cheaper Mexican labor in production (TED, 1997).

The NAFTA agreement was supposed to spread the wealth, pushing companies located in the *maquiladora* trade zone further into the country. This has not happened. Instead, more and more companies, primarily American, are relocating to take advantage of the cheaper labor costs – where workers are paid an average of US\$ 0.75 an hour. While the goals of setting up the *maquiladora* zones were admirable, they have brought about the same results as the *bracero* program (allowing Mexican citizens into the United States legally as seasonal farm workers); the exploitation of cheap labor (TED, 1997). “Automobiles, machinery, electronics, apparel, and furniture, previously manufactured in the United States but now made in Mexico by U.S. companies employing \$US 1.50/hour labor” flowed back into the U.S., resulting in the trade deficit with Mexico increasing from US\$ 1.7 billion in 1993 to US\$ 23 billion in 2001 and US\$ 31 billion in

2002. Net U.S. export gains came in agribusiness and bulk commodities like cereals and organic chemicals (Phillips, 2004), raising the question of possible adverse impacts on Mexican farmers having to compete with subsidized American farmers. As the result of NAFTA, “the U.S. trade surplus in agricultural products has declined sharply with Mexico, and has turned into a deficit with Canada...some U.S. producers of corn and cattle have profited, as have all the major grain trading companies, while Canadian Dairy farms, U.S. farmers growing wheat, barley, fruits and vegetables, and Mexican corn producers have all suffered catastrophic losses” (Scott, 1999). Job losses for U.S. industries centered in high wage sectors, mostly in the north (Phillips, 2004).

In 1988, the government of Mexico promulgated the General Law for Ecological Equilibrium and Environmental Protection, a comprehensive framework for environmental protection and natural resource preservation. Based on the U.S. Environmental Protection Act of 1970, the law addresses air, water and soil pollution, hazardous wastes contamination, use of pesticides and toxic substances, ecosystem conservation and consumption of natural resources (TED, 1993). Since 1994, the Secretariat of the Environment, Natural Resources and Fisheries (SEMARNAP) was created which brought the agencies responsible for implementing the county's sustainable development strategy under one roof (USMCOC, 1998):

- The National Ecology Institute (INE) is responsible for developing and reviewing environmental policies and regulations and environmental impact statements, including those involving hazardous waste.
- The National Water Commission (CNA) develops water quality standards, regulates and charges for discharges to water bodies under federal jurisdiction (all rivers, coastal waters and most lakes)

- The Office of the Attorney General for Environmental Protection (PROFEPA) is Mexico's primary enforcement agency and runs Mexico's environmental audit program.

“More than 3,000 *maquiladora* operations are currently in operation along the 3,220 km (2,000 mile) border that stretches from California to Texas -- and their numbers continue to grow. These duty-free industrial plants now focus on using cheap domestic labor to assemble mostly foreign components in a number of different industries. Concentrated development along the border as well as the nature of the industrial development has polluted much of the water supply along the border and created serious environmental issues that have yet to be addressed...” (TED, 1997).

“Mexico faces severe environmental degradation. Years of rapid population growth and industrialization, without adequate environmental investment and enforcement left a legacy of polluted waters and large quantities of improperly stored waste. Only in the last decade has Mexico had environmental laws which were adequate and only since 1993 have these laws been supported by appropriate implementing regulations, standards and institutional infrastructure to make them effective” (USMCOC, 1998).

Many environmental groups and U.S. Congressional members feared that NAFTA would precipitate a mass exodus of U.S. industry to the border region, adversely affecting the region's ecosystem with potential for Mexico's weaker environmental and enforcement standards to undermine tougher U.S. environmental standards. To some, this would represent a hidden subsidy for *maquiladoras*, since they would not have the expense required by U.S. laws governing environmental pollution (TED, 1993; USMCOC, 1998).

“Since NAFTA has been in place, Mexico has begun a serious effort to enforce its environmental laws for new companies, thereby diminishing any incentive for firms to relocate to Mexico to avoid environmental enforcement. In addition, the Mexican

government has begun a process to enforce more effectively its environmental laws by imposing sanctions against the more visible polluters and, more importantly, has developed a program of voluntary environmental audits. These audits permit companies to assess their environmental compliance and develop a program to clean up their operations" (USMCOC, 1998).

"In 1996, PROFEPA conducted 3,323 inspections and compliance verification visits in the border area, ordering 18 total facility closures, 59 partial closures, and fining 2,622 facilities. From 1992 through 1996 PROFEPA conducted 12,347 inspections and compliance verification visits in the border area, including at least one visit to every facility. PROFEPA reports a 72% reduction in serious violation in the maquiladora industry from 1993 to 1996. The percentage of maquiladora facilities in complete compliance, that is, without even minor violations, has climbed 43% during this period. On the U.S. side of the border in 1995 and 1996, EPA, the Department of Justice (DOJ) and state agencies brought over 100 civil, judicial and administrative enforcement actions for border area violations of the U.S. hazardous waste law, the Clean Air Act, the Clean Water Act, Toxic Chemicals law and Pesticides law" (USMCOC, 1998).

In an attempt to deal with environmental concerns, the environmental side agreement, the North American Agreement on Environmental Cooperation (NAAEC), created the Commission for Environmental Cooperation (CEC), the Border Environmental Cooperation Commission (BECC) and the North American Development Bank (NADB), the latter two under the US-Mexico Border Environmental Cooperation Agreement (BECA) (Hufbauer & Orejas, 2001).

Despite this institutional thicket, NAFTA's environmental record is mixed. The CEC has received 28 submissions concerning possible violations of environmental practices (nine versus Canada; 11 versus Mexico and eight versus the United States). The CEC provides an institutional framework for environmental cooperation and sponsors initiatives that reduce pollution (Hufbauer & Orejas, 2001).

The environmental impact of Mexican trade liberalization does not appear to have been positive. Various studies show that post-NAFTA, water, air and soil pollution has increased in Northern Mexico due to the growth of manufacturing industry and the controversial *maquiladora* sector along the border with the United States (Ghiso, 2003).

13.13.5 Foreign Direct Investment (FDI) in Sub-Saharan Africa

Currently, private financial flows in the form of FDI

“have remained highly concentrated in emerging markets. Thus the vast majority of developing countries, including almost all the LDCs, receive hardly any private financial flows” (ILO, 2004).

This implies that Sub-Saharan African leaders must allow the wealth of their country to flow through many hands and not just a few so that a vibrant consumer economy develops. They must place an emphasis on health and education to have productive citizens who can fit into the globalization of their economies and there must be rule of law and basic “democratic” processes in place that fit into their socio-cultural framework. As a result of these factors plus poor infrastructure and corruption, among others, the

“cost of doing business in Africa is 20-40% above that for other developing regions. Improving the investment climate and enhancing the incentives for African and other entrepreneurs to invest and engage in business are central to growth” (World Bank, 2005).

Currently, South Africa may be one of the few countries on the subcontinent meeting the prerequisites for FDI.

FDI and imports from Sub-Saharan Africa, other than industrialized South Africa, tend to be in the oil sector going to very few countries.

“Of the US\$ 2.52 billion in FDI that flowed into Sub-Saharan Africa during the last decade, just three countries accounted for much of that total — Angola, \$US 626 million, Lesotho, \$US 170 million, and Nigeria, \$US 876 million. If South Africa is excluded (as both a recipient and source of FDI), 5 other countries accounted for another US\$ 576 million — Republic of Congo, Cote D'Ivoire, Equatorial Guinea, Namibia, and Sudan — leaving the remaining 40 countries of Sub-Saharan Africa to compete for just \$US 275 million in annual FDI flows” (Luna, Cox & Slengesol, 2001).

Thus, other than in South Africa and Lesotho (textiles), most FDI is going into countries rich in petroleum and minerals (Table 13.7).

About 69% of total Foreign Direct Investment (FDI) flows to Africa in 2001 were accounted for by Sub-Saharan Africa. FDI to Sub-Saharan Africa surpassed the mark of \$10 billion for first time ever to reach \$11.8 billion in 2001 (UNCTAD, 2002a), but was revised to US\$ 13.295 billion (UNCTAD, 2003), largely the result of an Anglo American-De Beers deal, without which Sub-Saharan Africa would show little change. This is reflected in a return to previous FDI levels in 2002 of \$US 7.452 billion (UNCTAD, 2003) (Table 13.7). The increase in FDI flows in 2001 to South Africa is almost identical to the increase in FDI to the sub-region as a whole (UNCTAD, 2002a). UNCTAD places Sudan under North Africa, though many consider it part of Sub-Saharan Africa. Sudan has been added to Table 13.7, but has not been counted in the above figures.

Table 13.7: Foreign Direct Investment (FDI) in Sub-Saharan Africa, 1990-2002 (Millions of Dollars)

Country	1991-1996 Annual Average	1997	1998	1999	2000	2001	2002
Angola	346	412	1,114	2,471	879	2,146	1,312
Benin	41	26	35	61	60	44	41
Botswana	-28	100	90	37	54	26	37
Burkina Faso	9	13	10	13	23	9	8
Burundi	1	-	2	-	12	-	-
Cameroon	9	45	50	40	31	67	86
Cape Verde	10	12	9	53	34	9	14
Central African Republic	-1	-	-	3	1	5	4
Chad	20	44	21	27	115	-	901
Comoros	-	-	3	-	1	-	1
Congo	86	79	33	521	166	77	247
Congo Dem. Rep.	3	44	61	11	23	1	32
Cote d'Ivoire (Ivory Coast)	158	450	416	318	235	44	223
Djibouti	2	2	3	4	3	3	4
Equatorial Guinea	66	53	291	252	108	945	323
Eritrea	37	41	149	83	28	1	21
Ethiopia	10	288	261	70	135	20	75
Gabon	-243	-587	-200	-625	-43	169	123
Gambia	12	21	24	49	44	35	43
Ghana	105	82	56	267	115	89	50
Guinea Conakry	14	17	18	63	10	2	30
Guinea-Bissau	2	11	4	9	1	1	1
Kenya	13	40	42	42	127	50	50
Lesotho	21	32	27	33	31	28	24
Liberia	-28	214	190	256	-431	-20	-65
Madagascar	13	14	16	58	70	93	8
Malawi	-4	-1	-3	46	-33	-20	-
Mali	29	74	36	51	83	122	102
Mauritania	7	1	-	1	9	-6	12
Mauritius	21	55	12	49	277	32	28
Mozambique	39	64	235	382	139	256	406
Namibia	112	84	77	111	153	275	181
Niger	16	25	9	-	9	23	8
Nigeria	1,264	1,539	1,051	1,005	930	1,104	1,281
Rwanda	3	3	7	2	8	4	3
Sao Tome & Principe	-	-	-	1	2	6	2

**Table 13.7 (Cont.): Foreign Direct Investment (FDI) in Sub-Saharan Africa, 1990-2002
(Millions of Dollars)**

Country	1991-1996 Annual Average	1997	1998	1999	2000	2001	2002
Senegal	20	176	71	136	63	32	93
Seychelles	24	54	55	60	56	59	63
Sierra Leone	1	10	-10	6	5	3	5
Somalia	1	1	-	-1	-	-	-
South Africa	450	3,817	561	1,502	888	6,789	754
Swaziland	62	-15	152	100	39	78	107
Togo	11	23	42	70	42	63	75
Uganda	65	175	210	222	254	229	275
Tanzania	63	158	172	517	463	327	240
Zambia	108	207	198	163	122	72	197
Zimbabwe	50	135	444	59	23	4	26
Sudan	18	98	371	371	392	574	681
Total Annual FDI Without Sudan		8,038	6,044	8,661	5,364	13,296	7,451
Total Annual FDI With Sudan		8,136	6,415	9,032	5,756	13,870	8,132
Source:	Extracted from UNCTAD (2003).						
Note:	Least developed countries (LDCs) include: Angola, Benin, Burkina Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, the United Republic of Tanzania and Zambia. Oil-exporting countries include: Cameroon, Angola, Congo, Gabon and Nigeria.						
Note:	Table 11.4 indicates 2002 FDI was US\$ 7,963 including Sudan						

Gross Domestic Product (GDP),⁵⁶⁸ appears to reflect to a large degree foreign investment in the economies of Sub-Saharan Africa. It should be noted that of the Sub-Saharan African GDPs, South Africa, with the highest FDI, has the highest GDP of US\$ 104.2 billion. Nigeria, with the second largest FDI, has the next largest GDP of US\$ 43.5 billion. Sudan, with the third largest FDI, has the next highest GDP of US\$ 13.5 billion, followed by the Ivory Coast with a GDP of US\$ 11.7 billion and Angola with a GDP of US\$ 11.2 billion. This leaves a considerable gap between these five countries and the rest of Sub-Saharan Africa with a total GDP of US\$ 119.4 billion to distribute among the remaining 41⁵⁶⁹ Sub-Saharan African countries. This compares to the total GDP of \$US 26,298.9 billion (US\$ 26.3 trillion) for the OECD countries (UNDP, 2004).

⁵⁶⁸ See Footnote 48, Chapter 5, Section 5.2, ECONOMICS OF AGRICULTURE IN AFRICA.

⁵⁶⁹By UNDP count, which differs slightly from UNCTAD's estimate of 47 and the author's of 48 (see Table 13.7).

Morrissey (2003) found that private inflows into Sub-Saharan Africa peaked in the late 1970s at very low levels of just over 1% of GDP for FDI and just over 2% of GDP for Other Private Capital (OPC)⁵⁷⁰, but steadily declined. Total private capital inflows declined by more than 80% between the peak of the late 1970s and trough of the early 1990s. By the late 1990s, FDI began to increase, possibly reflecting increased privatization, while OPC remained stagnant with net outflow in the early 1990s. Official Development Finance (ODF)⁵⁷¹ – that is all foreign assistance, both multilateral and bilateral – was the most important inflow to Sub-Saharan African countries, averaging 12% of GDP over the entire period, with a steady increase from about 6% of GDP in 1970–75 to 14% in 1991–95. Thus, foreign assistance remains the most important investment in Sub-Saharan Africa, keeping these countries in perpetual welfare relations with the West (see Chapter 11, Section. 11.6.7, Foreign aid and puppet governments – “Donor Democracy”).

In 2001, the United States was in the top position among sources for FDI in Africa. Flows from the U.S. to Sub-Saharan Africa recovered from a long period of relatively low levels (US\$ 986 million for the period 1986–1990 and only US\$ 106 million in 1991–1996) to almost US\$ 5 billion in accumulated flows during 1996–2000. TNCs from the United States bought back South African affiliates sold off during Apartheid. FDI flows from almost all EU countries – including France, Germany, the Netherlands, Portugal, Spain, Sweden and the United Kingdom – to Sub-Saharan Africa increased from US\$ 1 billion per annum in 1991–1995 to US\$ 2 billion per annum in 1996–2000 (UNCTAD, 2002a).

⁵⁷⁰ Other Private Capital (OPC): commercial bank lending, bonds, other private credit, non-debt flows and portfolio equity investments (excludes FDI) (Morrissey 2003).

⁵⁷¹ Official Development Finance (ODF) = “Used in measuring the inflow of resources to recipient countries: includes (a) bilateral ODA, (b) grants and concessional and non concessional development lending by multilateral financial institutions (World Bank, IMF, African Development Bank/*Banque Africaine de Développement* (ADB/BAD), and (c) Other Official Flows (OOF) for development purposes (including refinancing Loans) which have too low a Grant Element (q.v.) to qualify as ODA” (DAC, 2005).

United States imports from Sub-Saharan Africa declined by more than 16% in 2002, reducing the interest of Transnational Corporations (TNCs) or multi-nationals in the subcontinent. In spite of the downturn, 24 countries out of Sub-Saharan Africa's 47 (30 of 53 for all of Africa), plus Sudan (listed under North Africa) attracted higher inflows in 2002 than in 2001, largely through greenfield FDI (new foreign investments). This was mainly in petroleum (Algeria, Angola, Chad, Equatorial Guinea and Sudan) and to a lesser extent in apparel (Botswana, Kenya, Lesotho and Mauritius) (UNCTAD, 2003). As will be seen below, any FDI gains made in the apparel sector by 2005 would have been reversed due to China having taken over this market.

While sustained export growth tends to involve a move up the technology ladder – from simple to complex products - Sub-Saharan Africa has lost market share, even in the slow-growing primary and resource-based exports in which it is specialized (UNCTAD, 2002a). Sachs (2005) found that the single most important reason for economic growth and the spread of prosperity was the transfer of technology, China being given as the prime example of a country that used FDI to import needed technologies; the key to it becoming an economic powerhouse. Sub-Saharan Africa needs to follow suit. Sachs (2005) also found that countries with the highest per capita GNP were the countries with the highest FDI.

Former U.S. Congressman, Jack Kemp, who is currently Co-Director of Empower America, suggests a 21st century Marshall Plan for Africa. He also supports the idea of allowing all products from Africa to enter the United States duty and quota-free. He supports allowing U.S. businesses investing in Africa to repatriate their profits tax-free for a five or ten year period as a means of kick-starting capital investment in Africa, quoting Uganda's President Yoweri Museveni, “

‘Ultimately, we don’t need aid. We need trade’ ” (Kemp, 2003). Museveni’s message to the Wall Street Journal, reiterated this theme (Museveni, 2003a; 2003b).

However, the Marshall Plan was tied to purchase of U.S. agricultural products, one of the reasons why the U.S. share in world trade in grains increased from less than 10% before WWII to more than 50% (half) by 1950 (Chomsky, 1999). In the July 2003 visit by George W. Bush to South Africa, the ANC government explained that although they welcomed closer trade ties with the U.S., subsidized agricultural products from America being dumped into South Africa – with obvious negative impacts on local farm production - would not be acceptable.

13.13.6 International Trade Agreements with Sub-Saharan Africa

“Africa benefits from a range of preference schemes – the GSP (Generalized System of Preferences); the EU Cotonou Agreement for African Caribbean and Pacific (ACP) countries; the US African Growth and Opportunity Act (AGOA), and various LDC schemes of the EU, Canada, and Japan. There are 33 LDCs in Sub-Saharan Africa, and 15 non-LDC African countries (Botswana, Cameroon, Cape Verde Côte d’Ivoire, Republic of Congo, Gabon, Ghana, Kenya, Mauritius, Namibia, Nigeria, Seychelles, South Africa, Swaziland, and Zimbabwe)” (Commission for Africa, 2005).

13.13.6.1 Generalized System of Preferences (GSP)

As a result of

“Resolution 21(ii) taken at the UNCTAD II conference in New Delhi in 1968, ‘the objectives of the generalized, non-reciprocal, non-discriminatory system of preferences in favor of the developing countries, including special measures in favor of the least advanced among the developing countries, should be:

- to increase their export earnings;
- to promote their industrialization; and
- to accelerate their rates of economic growth.

There are currently 16 national GSP schemes notified to the UNCTAD secretariat. The following countries grant GSP schemes: Australia, Belarus, Bulgaria, Canada, the Czech Republic, the European Community, Hungary, Japan, New Zealand, Norway, Poland, the Russian Federation, the Slovak Republic, Switzerland, Turkey and the United States of America” (UNCTAD, 2005).

The U.S. African Growth and Opportunity Act (AGOA) and the EU Everything but Arms (EBA) are specific programs linked to GSP.

13.13.6.2 AGOA

The major components of the African Growth and Opportunity Act (AGOA) (Public Law 106-200) are (Office of the United States Trade Representative, 2002; U.S. State Department, 2001):

- Creates a comprehensive trade and investment strategy for those countries in Sub-Saharan Africa who are committed to economic development;
- Helps countries make the transition to economic independence and self-sufficiency without jeopardizing humanitarian interests;
- Negotiates a U.S.-Africa Free-trade Area by 2020;
- Creates the U.S.-Africa Economic Cooperation Forum to bring together ministerial leaders from the U.S. and Africa to discuss bilateral and multilateral cooperation; and
- Creates the U.S.-Africa Trade and Investment Partnership, which would provide \$7 billion in private sector financing over five years, support micro, small and moderate-sized businesses and establish a \$32 billion textile and apparel initiative.

The Africa bill represents the first major trade promotion measure enacted in the U.S. since the North American Free-trade Agreement in 1994, a law that established duty-free commerce between Canada, the U.S. and Mexico. The African Growth and Opportunity Act (AGOA) or Africa Trade Bill provides beneficiary countries in Sub-Saharan Africa with the most liberal access to the U.S. market without a Free-trade Agreement (Export-Import Bank of The United States, 2001).

In particular, AGOA gives beneficiary Sub-Saharan African countries (Export-Import Bank of The United States, 2001):

- “Duty-free treatment under Generalized System of Preferences (GSP) for any article which the U.S. Trade Representative (USTR) and the U.S. International Trade Commission (USITC) determine is not import sensitive when imported from African countries.
- Duty-free treatment for more than 1,800 products. In addition to the standard GSP, 4,600 products available to other non-AGOA GSP beneficiary countries (some examples include agricultural products, building materials, chemicals, machine parts, yarns and fabrics).
- AGOA extends GSP for eligible Sub-Saharan African beneficiaries until September 2008, seven years longer than in the rest of the world”.

“The United States of America under the Generalized System of Preferences (GSP), provides preferential duty-free entry to approximately 3,000 products from some 1,423 designated beneficiary countries and territories...The purpose of this program is to encourage the economic growth of beneficiary developing independent countries and dependent countries and territories...Under the United States General System of Preferences (GSP), the cost or value of materials produced in the beneficiary developing country and/or the direct cost of processing performed there must represent at least 35% of the appraised value

of the goods" (ITDS, 2004) (see Section 13.13.6.3, Other agreements).

President Bush announced that the World Bank would give US\$ 200 million in loans to support small business in ten African countries over the next three years. However, he refrained from endorsing calls to end tariffs on key African exports, which the U.S. Congress has been told is necessary if AGOA is to have a chance of being successful (Goldfarb, 2003).

Madsen (1999) believed AGOA, as originally conceived under the Clinton Administration in 1998, was designed to exploit African resources and labor at the expense of both African and American workers. Is this still the case? Time will tell. Are America and its allies moving towards a new win-win policy or is it more of the "same old, same old" win-lose in which Africa is the whipping boy with the costs of doing business externalized through cheap labor and limited environmental controls as a means of maximizing profits (see Section 13.13.4, NAFTA, Maquiladora and the Environment, Lessons for Africa)?

Of the 48 Sub-Saharan African countries (number of SSA countries varies from 46-48 depending on reference), 38 are eligible for tariff preferences under the African Growth and Opportunity Act (AGOA) (Office of The President, 2003; USITC, 2003) (Table 13.8). Of the 38 Sub-Saharan African countries declared eligible for the African Growth and Opportunity Act (AGOA), only slightly more than half had exported goods under the program by mid-2002 (Booker & Colgan, 2004).

Table 13.8: Sub-Saharan African countries designated as beneficiaries under AGOA

Benin	Ghana	Nigeria
Botswana	Guinea- Conakry	Republic of Congo
Cameroon	Guinea-Bissau	Rwanda
Cape Verte	Kenya	Sao Tome & Principe
Central African Republic	Lesotho	Senegal
Chad	Madagascar	Seychelles
Cote d'Ivoire	Malawi	Sierra Leone
Democratic Republic Of Congo	Mali	South Africa
Djibouti	Mauritania	Swaziland
Eritrea	Mauritius	Tanzania
Ethiopia	Mozambique	Uganda
Gabon	Namibia	Zambia
Gambia	Niger	

On December 31, 2002, the DROC (DRC) was added to the eligibility list with delayed implementation of AGOA duty-free-trade benefits. On October 31, 2003, the DRC was granted AGOA preferences. Source: USDOC, "Results of the AGOA Country Review for 2003 Eligibility," found at internet address <http://222.agoa.gov>, retrieved Nov. 14, 2003

Source: USITC (2003) with permission, USITC.

To be eligible, a country must supposedly comply with the following (Office of The United States Trade Representative, 2000):

- Establishment of market-based economies;
- Development of political pluralism and the rule of law;
- Elimination of barriers to U.S. trade and investment;
- Protection of intellectual property;
- Efforts to combat corruption;
- Policies to reduce poverty and increase availability of health care and educational opportunities;
- Protection of human rights and worker rights; and

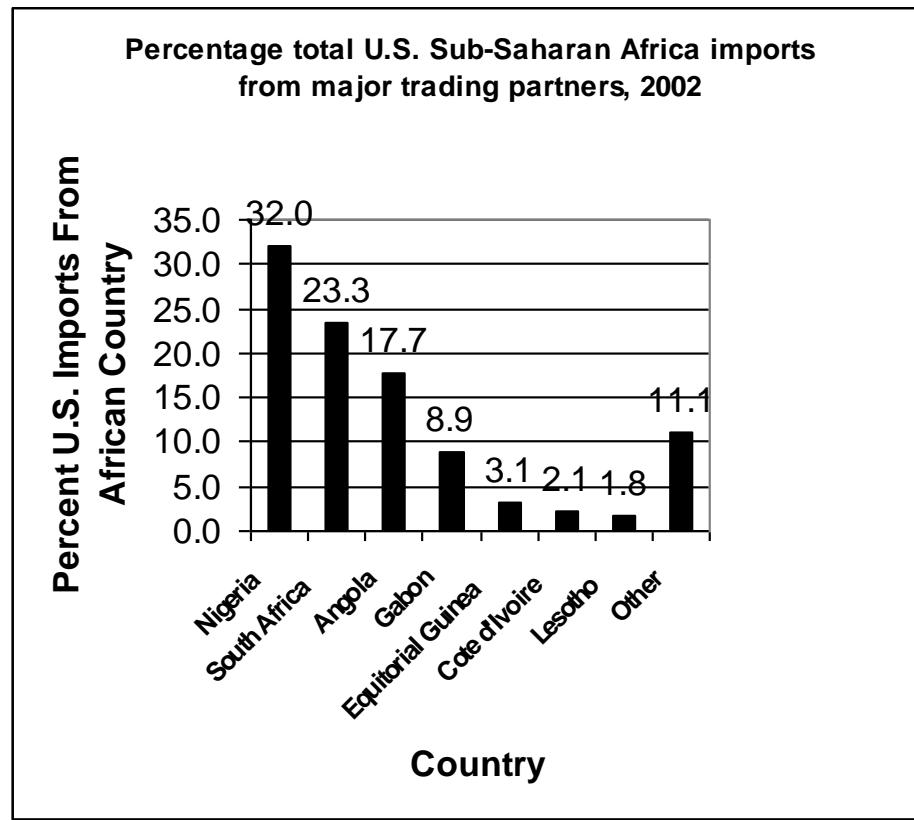
- Elimination of certain practices of child labor. AGOA states that eligible Sub-Saharan African countries must implement their obligations to combat the worst forms of child labor.

Given these requirements, it is surprising that many of the above countries comply, especially with regards to governance (see Chapter 11, Section 11.6, AFRICAN DEMOCRACY IN THE 20 AND 21ST CENTURIES), rule of law, press freedom, corruption, human rights and child labor. It is obvious that AGOA is heavily politicized.

Total 2002 imports to the USA from Sub-Saharan Africa are contained in Figure 13.7. Imports to the USA from Sub-Saharan Africa consisted primarily of oil, coal, minerals and metals (Figure 13.8), that is, raw products.

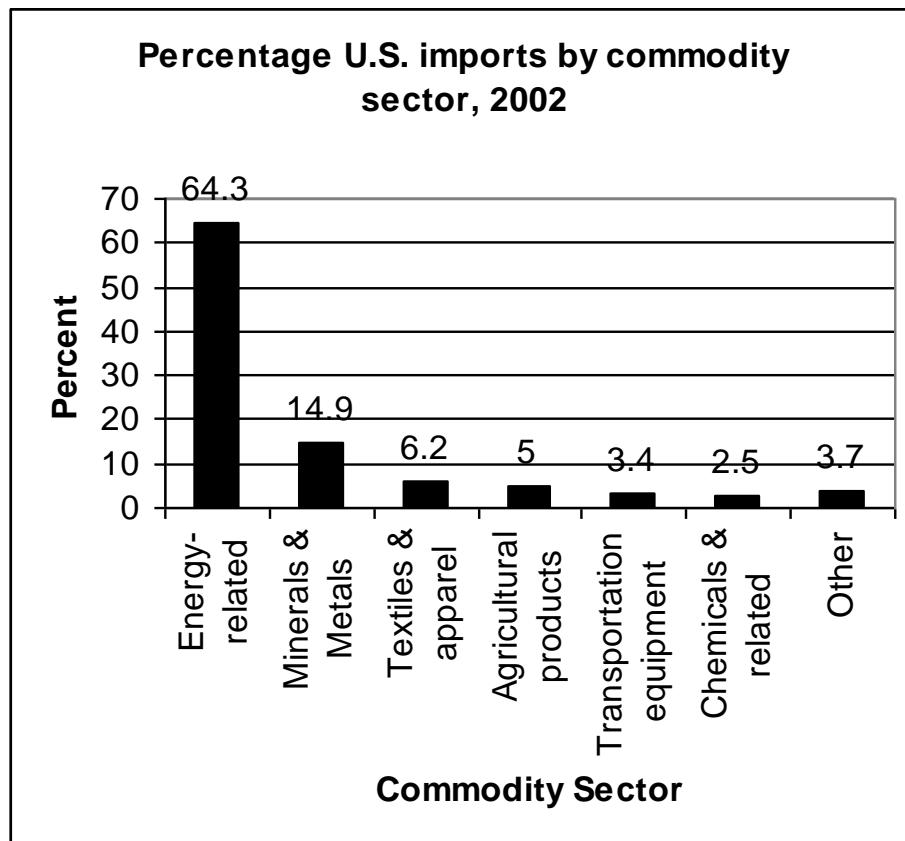
In 2002, imports from Sub-Saharan Africa under AGOA/GSP were about US\$ 9 billion, about 1% of all U.S. imports (Goldfarb, 2003; USITC, 2003), an increase of 9.9% from \$8.2 billion in 2001, with Nigeria (oil) and South Africa being the biggest beneficiaries (USITC, 2003). The largest share of U.S. imports under AGOA/GSP came from Nigeria (60.2%), followed by South Africa (14.9%) and Gabon (13.7%) (USITC, 2003).

Since it started just three years ago, exports from Sub-Saharan Africa that are related to AGOA are worth \$18 billion, creating 300,000 jobs. One of the biggest problems for AGOA and other similar agreements to be successful is to have a continual lifting of import controls for transformed products from Sub-Saharan Africa. For instance, while raw cocoa and coffee can enter the Chinese or European markets with low duty, African chocolates or roasted coffee can not (Wood, 2004)



Source: Extracted from USITC (2003) with permission, USITC.

Figure 13.7: Percentages of U.S. imports by country from major trading partners in Sub-Saharan African, 2002



Source: Extracted from USITC (2003) with permission, USITC.

Figure 13.8: Percent of U.S. Imports from Sub-Saharan African countries by commodity sectors, 2002

According to COMESA (2004),

“AGOA has helped to bolster the U.S. Sub-Saharan African trade and investment relationship. Total trade between the U.S. and the region was nearly \$24 billion in 2002, with U.S. exports of \$6 billion and U.S. imports of \$18 billion. U.S. imports under AGOA were valued at \$9 billion in 2002. By 2003, total trade between the U.S. and the region had jumped to \$25.4 billion, an increase of 9.4% while U.S. African Growth and Opportunity Act (AGOA) and Generalized System of preferences (GSP) imports were \$14.1 billion in 2003. The U.S. direct investment position in Sub-Saharan Africa increased by 5.8% at year end 2001 to \$10.2 billion, boosted largely by investments in the petroleum sector”.

“These imports were dominated by U.S. purchases of energy-related products (e.g., oil) in 2002 (Figures 13.7 and 13.8), which represented 75.9% of total AGOA imports in 2002, down from their 83.5% share of the total in 2001. However, significant increases were recorded for textiles and apparel, which accounted for 8.9% of the total in 2002, up from a 4.4% share in 2001, and transportation equipment, which represented a 6.1% share in 2002, compared with a 3.7% in 2001” (USITC, 2003).

For the most part, other than industrialized South Africa, AGOA benefits are concentrated in a few countries rich in petroleum mineral resources. This trend will increase since Angola became eligible at the end of 2003 (Booker & Colgan, 2004) and now that Equatorial Guinea’s oil is coming online.

Nontraditional export sectors, such as fruits, vegetables, processed food, textiles, vehicles and vehicle parts, as well as appliances, are beginning to make inroads. The automobile and fruit sectors in South Africa and information technology sector in Uganda⁵⁷² are beginning to benefit from AGOA (USITC, 2003).

However,

“restrictions on African access to U.S. markets, and agricultural subsidies to U.S. agribusinesses, continue to undermine Africa’s competitiveness and constrict the continent’s trade-related development” (Booker & Colgan, 2004)

⁵⁷² Rocky Mountain Technology Group, U.S.-based information technology firm plans to create a “cyber city” in Kampala.

Apparel Provisions

This includes:

- Unlimited duty-free and quota-free U.S. market access for apparel made from U.S. fabric, yarn and thread; and
- Duty-free and quota-free U.S. market access for apparel made from yarns and fabrics not available in the United States and capped market access for apparel made from yarns and fabrics produced in beneficiary countries in Sub-Saharan Africa.

AGOA helps apparel makers in Sub-Saharan Africa compete by using the world's most competitive fabrics with options of using locally made materials or, under the Special Apparel Provision, poorer Sub-Saharan African countries can use materials from anywhere – “Third Country Fabric” – even Asian ones. Madagascar, benefiting from the Special Apparel Provision, increased exports of textiles and apparel to the USA in 2001 by almost 83% (ANON, 2002c).

Growth of the clothing industry is a unique phenomenon, but remains concentrated in just a few countries - Mauritius, Madagascar, South Africa, Lesotho and Kenya (Table 13.9), while Swaziland and Namibia are increasing activity in the sector owing to factors such as privatization, increased foreign investment and trade preferences such as AGOA (USITC, 2003). As a result of AGOA, “in less than five years, Lesotho developed a textile industry from nothing to one that employed about 60,000 people”, surpassing the government as the biggest employer in the country “and by 2003 was exporting \$400 million worth of garments to the United States. Lesotho exports more garments to the United States than any other Sub-Saharan country” (Robertson, 2005). AGOA,

with its emphasis on textiles and apparel, (Hayes, 2003; Goldfarb, 2003) shows minimal benefit for the remainder of Sub-Saharan Africa.

Table 13.9: Imports to USA from Sub-Saharan Africa under Africa Growth & Opportunity Act (AGOA)

Country	General	Textiles	Agriculture Fisheries Forestry	Chemicals	Petroleum & Energy	Minerals	Transport Products
Total Value \$US (Million)		803	242	136	6,800	373	533
Percentage Of U.S. Sector Imports From Each Country Under AGOA							
Nigeria	32				79		
Angola	17.1						
Gabon	8.9				17		
Ghana			4				
Equatorial Guinea	3.1						
Ivory Coast	2.1						
Lesotho	1.8	42	9				
Kenya		16					
Mauritius		14					
Madagascar		9					
Malawi			15				
South Africa	23.2	11	58	99		99	99
Swaziland			3				
Other	11.1	8	11	1	4	1	1

Extracted from: USTIC (2003) with permission, USITC.

Taiwan, South Korea and Malaysia have climbed the economic ladder through labor intensive cloths manufacturing. Under AGOA, all labor, including the knitting of clothing from bolts of cloth and yarn to cutting, stitching, sewing and finishing, must be performed in Sub-Saharan Africa, precluding semi-finished products from Asia being finished in Sub-Saharan Africa to avoid U.S. import taxes (Lucas, 1999). Total U.S. textile imports from SSA rose 14% in 2002, reaching \$1.1 billion, of which AGOA accounted for US\$ 803 million, up 123% from 2001. This still represents less than 1 % of total sector imports into the U.S. Primary items included cotton sweaters and pullovers and cotton men's and women's trousers (USITC, 2003).

Statistics for 2004 and 2005 may look much different. Because of a stronger Rand, South Africa's share of the textile market diminished in 2002 and 2003 as U.S. customers sourced cheaper Asian products. Lesotho, whose currency, the MaLoti, is pegged to the Rand, has also been hurt. Furthermore, at the beginning of 2005, the "Multi-Fiber Arrangement under which quotas were set, was lifted at the start of this year, as mandated by the World Trade Organization (WTO). As a result countries such as China, while still subject to tariffs and duties, are no longer restricted by quantity" (Robertson, 2005). The Asian countries depreciated their currencies against the U.S. dollar, allowing them to easily out compete the Rand and currencies pegged to it. As a result in Lesotho,

"six Asian-owned factories have closed and returned to their home countries in the past four months, resulting in more than 6,000 job losses, another 4,000 jobs were lost last year" (Robertson, 2005).

South Africa has lost 300,000 textile jobs in the past two years, the South African Textile Federation requesting (Phiri & Nduru, 2005) and the South African government imposing (Hill, 2007) quotas on textile imports, with Chinese clothing representing 86% of the total garments imported into South Africa (Phiri & Nduru, 2005). Clothing exports from China to South Africa rose by 40 percent in the last nine months of 2005 and after protests from the South African government, China has now claimed it will limit the amount to prevent further job losses (Smith, 2006). Other estimates are a loss of 70,000 textile jobs in South Africa over the last four years from low-cost Asian producers, adversely impacting nearly 500,000 people in the family support network (Hill, 2007).

Malawi last 2,411 jobs between January and March 2005, with the closure of one Taiwanese textile factory with 11,000 workers in nine textile factories facing an uncertain future. There are 30,000 jobs at stake in Swaziland with AGOA products constituting 83% of all exports from this country and 50,000 textile

workers exist in Lesotho (Phiri & Nduru, 2005) (see Chapter 12, Section 12.2.4.4, Cotton subsidies and protected markets, Trade Agreements Hurt U.S. Textiles).

Under AGOA, most of the Foreign Direct Investment (FDI) has come from Asia (Taiwan and China) to expand existing apparel production and building textile mills to produce yarn and fabric, enabling apparel producers in the less developed Sub-Saharan African countries to continue qualifying for preferential treatment if the scheduled expiration of the “Third-Country Fabric” provision on September 30, 2004 takes place (USITC, 2003). According to COMESA (2004),

“The Third-Country Fabric provision, which relates to the use of yarns and fabrics from third countries by Least Developed Countries (LDCs) will not be extended beyond 2007 hence the urgent need to mobilize investment in this area. Countries like Zambia need to move fast to ensure that the yarn production capacity is expanded so that other countries in the region could source the required volumes and quality of yarns and fabric from the country”.

In July 2004, the U.S. Senate approved an extension of AGOA from 2008 to 2015 and the “Third-Country” (from outside of Africa – such as India and East Asia) provision on fabric from 2004 to 2007, including a phase down of benefits in year three, at which stage only 50% of AGOA apparel imports could be made from “Third Country Fabric” (COMESA, 2004).

“the AGOA Acceleration Act of 2004 (AGOA III, signed by President Bush on July 12, 2004) extends preferential access for imports from beneficiary Sub Saharan African countries until September 30, 2015; extends third country fabric provision for three years, from September 2004 until September 2007” (U.S. State Department, 2005).

All this has to be set against the backdrop of a 15% fall of total U.S. imports from Sub-Saharan Africa in 2002 (UNECA, 2004). In 2005, clothing and cloth exports from southern Africa appear to be unraveling.

Agricultural, Fisheries and Forestry Products

In order to expand the benefits of AGOA to the rest of Sub-Saharan Africa, it was recommended that America open its doors to African agricultural products (Hayes, 2003).

In this sector, U.S. imports from Sub-Saharan Africa are minor, amounting to US\$ 1 billion in 2002 (US\$ 242 million from AGOA) or 1% of total imports. However, U.S. sector imports from SSA rose by 8% in 2002 compared with the previous year. Major suppliers in 2002 included Côte d'Ivoire (the Ivory Cost) for cocoa beans, vanilla beans, tobacco and coffee, and South Africa for sugar. Principle suppliers under AGOA were South Africa, Malawi and Côte d'Ivoire (USITC, 2003). The principal products imported under AGOA in 2002 were (USITC, 2003):

- Raw cane sugar at US\$ 44 million, or 18% of the total AGOA imports under this category. U.S. imports of raw cane sugar under AGOA increased by \$16 million, or 59% of AGOA imports, in 2002 compared with the previous year, the major supplier being South Africa (47% of the value). Virtually all U.S. imports of sugar from AGOA sources enter under GSP and, although subject to a prohibitive tariff rate quota, the quota for these suppliers was only about 75% filled in fiscal year 2002, leaving room for future expansion.
- Stemmed and stripped tobacco at \$31 million, or 13% of total AGOA imports under this category.

- Leather (HTS 4113.90, mainly of ostrich) at \$17 million, or 7% of total AGOA imports under this category.
- Other major products showing substantial import growth under AGOA in 2002 include certain leather, wood doors, certain nuts and cocoa powder.

South African exports to the U.S. have increased under AGOA, especially oranges, mandarins, canned pears, canned citrus and macadamia nuts. In South Africa, an entrepreneur teamed up with Sunsweet Growers Inc., located in Yuba City, California, to produce sugar-free fruit bars. A specialty firm in South Africa that produces ice cream in coconut shells and other fruit cases landed a contract with a large U.S. retail firm. A major international wine and grape concentrate producer based in the Western Cape of South Africa is opening markets to the U.S. under AGOA, while Kenya is beginning to export fully processed coffee. U.S. Foreign Direct Investment (FDI) in this sector in 2002 was US\$ 113 million, down from a high of US\$ 217 million in 1998 (USITC, 2003).

In 2002, South Africa, with an investment of US\$ 97 million out of a total of US\$ 113 million, continued to be the primary SSA location for U.S. FDI in this sector. The food sector continued to account for a minor share of the total. U.S. Coca-Cola purchased a juice and a bottled water brand from SAB Miller in South Africa for \$13 million, providing Coca-Cola with a 45% share of the bottled water market in South Africa. Coca-Cola also invested \$8.2 million in Kenya to produce a non-carbonated fruit drink. Tanzania is developing an investment incentive package for the processing of traditional export items such as cotton, coffee and cashew nuts, as well as nontraditional items, including fruits, vegetables and flowers. The Seychelles and Botswana received minor U.S. investments of US\$ 4 million and US\$ 3 million respectively (USTIC, 2002).

Chemicals

South Africa continues to lead SSA in the production of chemicals, supplying 60% of the total, with organic chemicals as the leading product category accounting for 45% of the total. U.S. imports of chemicals under AGOA totaled \$136 million in 2002, with South Africa supplying nearly all sector imports under AGOA (99%), including major products such as silicon and titanium dioxide pigments (USITC, 2003) (Table 13.9).

The 2002 U.S. Foreign Direct Investment (FDI) in the chemical products sector amounted to US\$ 591 million, up from US\$ 215 million in 1998. South Africa continued to be the primary SSA location for U.S. FDI in the sector, accounting for 93% of the regional total. Dow South Africa (Dow SA) is reported to be divesting a number of chemical plants, thus far selling off plants producing calcium carbide, mining chemicals and synthetic rubber. This amounted to US\$ 550 million invested in South Africa with minor amounts invested in Nigeria (US\$ 13 million), Zimbabwe (US\$ 12 million), Kenya (US\$ 10 million), Zambia (US\$ 5 million) and Mauritius (US\$ 1 million) (USITC, 2003).

Petroleum and Energy Related Products

Crude petroleum from Nigeria and coal from South Africa continue to be the primary petroleum and energy-related products produced in SSA. Angola remains the region's second largest producer of crude petroleum behind Nigeria. Under AGOA, Nigeria and Gabon provided 79% and 17% respectively of the imports (see Table 13.9). The U.S. FDI in SSA was US\$ 3,471 million (3.471 billion) in 2002 down from the US\$ 4,600 million in 2001 (USITC, 2003).

As the major U.S. FDI sector, this sector received 41% of U.S. FDI in Sub-Saharan Africa in 2002. This included Equatorial Guinea (US\$ 1,648 million), Nigeria (US\$ 824 million) and Gabon (US\$ 467 million), together accounting for 85% of the regional total of US\$ 3,473 million. This amounts to only 4% of the U.S. FDI in this sector globally (USTIC, 2003), though with all the problems in the Middle East, investment is expected to increase significantly (USITC, 2003).

Minerals and Metals

South Africa continued to dominate the region's exports (US\$ 2.7 billion) to the United States in 2002. South Africa's decrease in exports to the USA in this sector by US\$ 327 million in 2001 is due to decreased exports of gold bullion and ferronickel, reflecting general market conditions. Botswana's exports to the U.S. increased as the result of the sourcing of raw diamonds away from Sub-Saharan Africa's conflict regions and Botswana's high ranking in the Transparency International Corruption Index. While sectoral U.S. imports declined overall in 2002, imports under AGOA increased to US\$ 373 million primarily from South Africa (Table 13.9) and Kenya, with ferroalloys accounting for the majority of imports, along with a significant increase in aluminum and finished products as the result of processing investments in western Sub-Saharan Africa (e.g., Guinea) (USITC, 2003).

The 2002 U.S. FDI in SSA in the mineral and metal sector was US\$ 56 million, down from US\$ 71 million in 2001. Ghana was the major SSA location for U.S. FDI in the sector in 2002, accounting for 82% (US\$ 46 million) of the regional total (US\$ 56 million). The sector accounted for less than 1% of the total U.S. FDI position in SSA in 2002, and SSA accounted for less than 1% of the global U.S. FDI position in the sector that year. When contrasted with the U.S. mining

FDI, the mining sector of SSA is receiving little investment from U.S. sources (USITC, 2003).

Anglo-American PLC pulled out of the Konkola copper mining facilities (Zambia) in 2002. Mozambique's Mothalala aluminum smelter, which is the country's largest single investment (US\$ 1.3 billion), expanded, setting world production records (see Chapter 7, Section 7.11.7.3, Kariba and Cahora Bassa Dams, Zambezi River). Anglo-American's Zimbabwe platinum project, Unki Mine, issued US\$ 90 million in tender offers for development (USITC, 2003).

Factors posing a deterrence to new investment and reinvestment in Sub-Saharan Africa include political stability and potential for re-nationalization, as well as health risks, including malaria and the increasing HIV/AIDS rate, raising employee health costs and thus diminishing the financial attractiveness of potential investments. Especially health issues make it difficult to find suitable foreign technical professionals to move to the region to manage operations (USITC, 2003). In such cases, nationals must be trained-up to take these positions.

South Africa's new Mineral Law gives the government ultimate ownership of all of the country's mineral resources. Licenses will be issued for up to five years for prospecting rights and up to 30 years for mining rights, with the expressed purpose of creating more black ownership. Although the government claims there will be automatic conversion of the "old order rights" to "new order rights", there may be a temporary drop in investment while the details of the law regarding paying for the asset rights are worked out (USITC, 2003).

Transportation Materials

South Africa is the dominant producer of motor vehicles and motor-vehicle parts in the SSA region, accounting for 96% of SSA motor vehicle production in 2002; 99% under AGOA (Table 13.9). The automotive industry in South Africa accounts for nearly 6% of its GDP and 10% of its total manufacturing. It is comprised of foreign subsidiaries and local-foreign joint venture operations. BMW, Daimler-Chrysler and Nissan benefit from AGOA, with the motor vehicle manufacturing industry employing 33,000 and the component manufacturing industry employing 60,000 people (USITC, 2003).

In 2002, the United States ran a US\$ 257 million deficit in certain transportation equipment trade with SSA. Passenger cars accounted for 84% of total U.S. sector imports from South Africa, while imported components included road wheels, engine parts, shock absorbers, mufflers and exhaust pipes. U.S. imports of transportation equipment, mainly passenger vehicles, under AGOA, all came from South Africa, increasing by 85% in 2002 to US\$ 533 million, with AGOA imports accounting for 95% of total U.S. sector imports from Sub-Saharan Africa. The South African automotive industry is the leading exporter in this sector under the AGOA program, with the component manufacturing industry seeking technology-sharing with foreign partners (USITC, 2003).

U.S. Foreign Direct Investment (FDI) in the transport sector in 2002 for SSA was US\$ 328 million up from US\$ 248 million in the previous year. All of this investment went to South Africa. In 2002, the Gauteng provincial government committed to investing some \$100 million to establish an automotive supplier park in Rosslyn, South Africa, that will accommodate 200 facilities of varying sizes for suppliers of a variety of components. Ford has become the full owner of Ford Motor Co. of southern Africa (FMCSA). General Motors owns 49% of Delta

Motor Corp., which assembles Isuzu and Opel (GM's/General Motors European vehicle line) vehicles at two plants. BMW is upgrading its South African facilities with an installed capacity of 60,000 vehicles per year. In 2002, Toyota Motor Corp., which owns 74.9% of Toyota South, provided \$100 million in capital improvements in preparation for production of new generation Corollas, including South Africa in its global supply network with plans to more than double its export capacity to 200,000 vehicles per year by 2005 (USITC, 2003).

Other

A major South African appliance manufacturer and distributor announced the expansion of its manufacturing facility in Cape Town in order to keep up with the export demand of a U.S.-based appliance brand. South African exporters have begun to export several new products since the AGOA program, including fishing rods (USITC, 2003). Complimenting AGOA, the U.S. Government has various trade capacity-building initiatives amounting to US\$ 106.5 million dollars in 2002 to Sub-Saharan Africa (Table 13.10). However, in order to achieve these goals, then Secretary of State Colin Powell told African politicians at a meeting of the Corporate Council on Africa that they must attack corruption, warning that capital is a "coward" that shuns uncertainty and crime. It flees war and disease and it will not go near corruption (Goldfarb, 2003).

Table 13.10: U.S. support for building trade capacity, by geographic region, FY 1999 – FY 2002 (Millions dollars)

Region/Country	FY 1999	FY 2000	FY 2001	FY 2002
Middle East & North Africa	21.1	110.4	118.3	147.1
Asia	48.5	69.7	114.3	109.9
Sub-Saharan Africa	80.5	94.7	64.1	106.5
Former Soviet Republics	97.4	84.0	97.6	72.1
Central & Eastern Europe	56.6	29.4	38.9	63.4
Latin America & Caribbean	52.4	65.0	61.6	90.8
Global (a)	12.3	51.3	104.0	49.0
All Developing & Transitional Economies	369.1	504.5	594.7	637.8

(a) Assistance programs involving countries from two or more regions & for which country & regional breakdowns were not feasible

Note: Due to rounding, numbers shown may not add to totals shown

Source: USAID Trade Capacity-Building Database. "Trade Capacity Building Database: Summary Statistics, "found at internet address <http://quesdb.cdie.org/tch/overview.html>, retrieved June 23, 2003

Source: USITC (2003) with permission, USITC.

Overall Trade Deficit between USA and SSA

Overall, the U.S. trade deficit with SSA reflects its needs for primary products from this continent, especially oil. In 2002, the U.S. merchandise trade deficit with SSA decreased by \$2.0 billion to \$12.3 billion, compared with deficits of \$14.3 billion in 2001 and \$16.7 billion in 2000. The SSA country with which the United States had the largest trade deficit in 2002 remained Nigeria, measured at \$4.8 billion, down from \$8.0 billion in 2001; followed by Angola (\$2.9 billion in 2002, up from \$2.5 billion in 2001), South Africa (\$1.8 billion in 2002, up from \$1.6 billion in 2001) and Gabon (\$1.6 billion in 2002). South Africa is the only major country where U.S. trade deficits are not due to oil. On a sectoral basis, the largest U.S. trade deficit with SSA occurred in energy-related products, with a deficit of \$11.5 billion in 2002, down from \$14.1 billion in 2001. Second were minerals and metals, with a deficit of \$2.4 billion in 2002, down from \$2.8 billion in 2001. The U.S. trade deficit in textiles and apparels increased to \$1.0 billion in 2002 from \$868 million in 2001 (USITC, 2003).

13.13.6.3 Other agreements

The EU Cotonou Agreement for African Caribbean and Pacific (ACP)

“is a very open scheme, with enhanced preferences beyond those in the GSP scheme, and with protocols for bananas, beef, veal and sugar. This incorporates all of SSA excluding South Africa” (Commission for Africa 2005).

Under the Cotonou Agreement products covered by the Common Agricultural Policy (CAP) still face customs duties.

The EU’s “Everything but Arms (EBA)” (Regulation (EC) 416/2001, February 2001) initiative of duty-free and quota-free entry for all products (except arms) for LDCs includes 34 African countries. Although access to the EU markets for agricultural products may no longer be a major problem for African LDCs, a number of factors may impede African preferential access. This includes rules of origin and standards such as sanitary/phytosanitary requirements and other technical barriers to trade (NEPAD, 2002).

“Only imports of fresh bananas, rice and sugar are not fully liberalized immediately. Duties on those products will be gradually reduced until duty free access will be granted for bananas in January 2006, for sugar in July 2009 and for rice in September 2009. In the meantime, there will be duty free tariff quotas for rice and sugar (see the latest regulations for sugar quotas No 1381/2002 and rice quotas 1401/2002 in the list of legislation). The EBA Regulation foresees that the special arrangements for LDC's should be maintained for an unlimited period of time and not be subject to the periodic renewal of the Community's scheme of generalized preferences. Therefore, the date of expiry of Council Regulation (EC) No 2501/2001 does not apply to its EBA provisions” (EU, 2004).

The tariff on bananas will be reduced 20%/year between January 1, 2002 and January 1, 2006, with the 2002 quota being 544 EUR/1,000 kg (i.e. 80% of the Most Favored Nation (MFN) duty of 680 EUR/1,000 kg). Customs duty for rice will see the tariff reduced to zero between September 1, 2006 and September 1, 2009. In the interim, rice can come in duty free under a tariff quota, growing 15%/year between 2001/2002 and 2008/2009 respectively, from 2,517 tons to 6,696 tons. Full trade liberalization of sugar will be phased in between July 1, 2006 and July 1, 2009, gradually reducing the full EU tariff to zero. In the meantime, sugar can come in duty free within the limits of a tariff quota, from 74,185 tons in 2001/2 to 197,335 ton in 2008/9 (Table 13.11) (UN, 2002).

Table 13.11: Summary of the European Union “Everything but Arms (EBA)” initiative

	Pre-EBA	EBA
Product Coverage	<ul style="list-style-type: none"> • All GSP covered products • Additional list of products for LDCs only • Certain sensitive agricultural products excluded 	All products but arms (HS Ch 93)
Depth of Tariff Cut	<ul style="list-style-type: none"> • Duty-free for all GSP covered products • For the additional list of products, different tariff cuts available according to the import sensitivity of products (four products categories) • No preferences on the specific component of MFN duties, on entry price, on the agricultural component and on other duties 	<ul style="list-style-type: none"> • Duty-free for all products • All duties entirely • Delayed (phased-in period). Trade liberalization for bananas, sugar & rice
Rules of Origin	Regulation 1602/2000	Regulation 1602/2000 but ACP LDCs moving into EBA may lose ACP

Source: UN (2002) with permission, UN.

“In 2003 Canada expanded its GSP scheme to cover substantially all products from LDCs, including textiles and clothing, with the exception of a limited number of products (eggs, poultry and dairy), along with liberal rules of origin. In 2000 and 2003, Japan has progressively expanded the number of industrial and agricultural products from LDCs receiving duty-free access. This

covers 31 SSA LDCs except for Djibouti and Comoros” (Commission for Africa, 2005).

Stiglitz (2002) believes this is a start, but still puts developing countries at a competitive disadvantage due to competing with EU agricultural subsidies (see Chapter 12, Section 12.2.4, Agricultural Tariffs and Subsidies). Modeled benefits to Sub-Saharan Africa from liberalizing OECD agricultural markets show losses to Sub-Saharan and southern Africa when partial trade liberalization is carried out largely due to the impact of preference erosion, with many African countries being major beneficiaries of existing preferential trading arrangements (e.g., beef from southern Africa and sugar from Mauritius under the Lomé Convention). The gains from full liberalization increase from US\$ 704 million in the static model to US\$ 4.3 billion in the dynamic model, associated with the impact of capital accumulation. This indicates the importance of complementing trade liberalization with investment (FDI) enhancing policies. However, it was found that the reforms may force countries to specialize more in the production of agricultural commodities, indicating the urgency of adopting policies to promote export diversification out of primary commodities and into industrial and service industries with a higher value-added (UNECA,⁵⁷³ 2004). Relying on primary commodities, as discussed in Chapters 5 and 12, indicates that

“price volatility, arising mainly from supply shocks and the secular decline in real commodity prices, and the attendant terms-of-trade losses have exacted heavy costs in terms of incomes, indebtedness, investment, poverty and development” (UNECA, 2004).

⁵⁷³ United Nations Economic Commission for Africa (UNECA).

13.14 NEPAD

With the “New Partnership for Africa’s Development (NEPAD), African governments have clearly recognized the weaknesses in their public institutions and the need for better governance as well as the changes that need to be brought about. They have, in this context, established a peer review mechanism in order to encourage compliance” (UNCTAD, 2002b).

“NEPAD recognizes that to achieve the estimated 7% annual growth rate needed to meet the Millennium Development Goals—particularly the goal of reducing by half the proportion of Africans living in poverty by the year 2015—Africa needs to fill an annual resource gap of 12% of its GDP, or \$64 billion a year, with the bulk coming from outside” (World Economic Forum, 2004).

The G-8 has endorsed NEPAD as part of an African Action Plan, with the idea that foreign investment is more important for development than foreign aid. This will require societies attractive to investors, compelling African governments to embrace stability, the rule of law and good governance (CNN, 2002b).

NEPAD “calls for the privatization of social services, a further shift towards export oriented economic growth, and public private partnerships to increase the efficiency with which scarce resources are used. The thinking is that Africa’s integration into the global economy will alleviate widespread poverty, because Africans will be able to work in export industries, and thus buy food” (Patel & Delwiche, 2002).

With the current level of poverty in Africa, many people are concerned that the privatization of social services (e.g., water, education, health) prior to having an affluent middleclass will further impoverish the majority of Africans, holding back the development of the continent. How this takes place must be analyzed carefully. Certainly, much of these services are supported wholly or partially by the state in the U.S. and EU countries.

Leading business organizations in North America, Europe and Africa, spearheaded by the International Chamber of Commerce and the African Business Roundtable, have set up a NEPAD business group with the idea that governments will involve the private sector more closely in devising and implementing their programs. In order to increase investment that will generate economic growth and wealth creation, thousands of first time investors will have to be introduced to Africa. Regulatory and economic policies coming from some of the world's foremost business organizations will boost investor confidence. The NEPAD business group submitted a detailed seven year plan to create reliable capital markets in Africa with a healthy investment management industry (Hampshire, 2002).

NEPAD is also being criticized.

"Patrick Bond, professor at the University of the Witwatersrand (now with University of KwaZulu-Natal School of Development Studies) in Johannesburg and others attack the lack of democracy in the NEPAD process: 'During the formulation of NEPAD, no civil society, church, political party, parliamentary, or other potentially democratic or progressive forces were consulted' " (Patel & Delwiche, 2002).

Bond (2002) is concerned that NEPAD has adopted neoliberal policies of the IMF and World Bank (e.g., privatization of social services, continued export of raw products) disguised under sustainable development rhetoric. He believes that NEPAD has been negotiated between governments, the private sector and the West, without input from civil society, with the result that NEPAD will not serve the continent's poor.

Similarly, Booker, Minter and Colgan (2003) conclude that NEPAD policies are

“failed economic policies and programs of the World Bank (e.g., structural adjustment) and rich-country governments while neglecting to lay the basis for the democratic participation of African people”.

Several groups, including the Economic Justice Network, the Third World Network-Africa, the Secretariat of the Gender and Trade Network in Africa, and the Alternative Information and Development Centre, say this:

“ ‘In essence, the document is an attempt to negotiate with Northern powers the terms of Africa’s integration into the world economy without challenging the systemic and structural dynamics by which globalization has further marginalized and created polarization within Africa, both within individual African countries and between them’ ” (Patel & Delwiche, 2002).

In short, NEPAD seems to be a plan for elites in Africa and elsewhere to mine the resources of the continent and its people. In fact, the reason many African countries are in such a perilous state is because they have been following NEPAD-like policies for the past 20 years. It is hardly likely that more of the same toxin will cure the continent (Patel & Delwiche, 2002). According to the World Economic Forum (2004), NEPAD is based on Poverty Reduction Strategy Papers (PRSPs). As noted in Chapter 12 (see Section 12.5.1, The HIPC Initiative - Half-hearted, Inadequate, Piecemeal Cancellation “Debt Relief”), PRSP’s have been attacked for still incorporating failed structural adjustment policies and a failure to adequately involve civil society in their preparation. “Is this a wolf in sheep’s clothing”? Let everyone hope that these criticisms are wrong. NEPAD must avoid the failed structural adjustment policies of the Washington Consensus at all costs (see Chapter 12).

There is also concern that the leader of NEPAD, South Africa, by ignoring the flawed 2000 election and continued human rights atrocities by Zimbabwe's ruling party – ZANU-PF – (see Chapter 5, Section, 5.7.4.1 Politicization of land reform in Zimbabwe, impacts on food production, the economy and wildlife) is compromising the legitimacy of NEPAD and, in return, a willingness by the global community to invest in what is perceived as a volatile and insecure continent where sizable investments can be lost if a country slips into anarchy. Abdoulaye Wade, President of Senegal and one of the co-authors of NEPAD, has criticized its implementation to date as supporting dictators and tyrants (Bond, 2002). If the NEPAD process is to work and confidence by foreign investors is to take place, it will be necessary for the African Union to develop honest internal reviews of the continent's move towards some sort of open society and acceptable democratic process, even if Africanized and not fitting the cookie cutter model imposed by the West, but which allows for the voice of the people to be heard; transparency in how the country's wealth is invested, as well as an orderly transition of power.

On the positive side, NEPAD's leader South Africa has 1) Maintained a strong currency, some say too strong for the export market of many transformed products, 2) Minimized the dumping of subsidies from the West that would destroy agriculture and 3) Said that it welcomes foreign aid, but will use its experts and purchase South African made products – being wise to how foreign aid has stimulated Western economies and failed to find appropriate solutions to Africa's development problems. Although criticized in the press and in writing (Bond, 2002), South Africa is also dealing with the problems of a massive under class as it brings about transformation by assuring that, where utilities exist, every person is guaranteed a minimum of 6,000 liters of water/month and 50 kilowatt hours/month of electricity. In the poorer townships, “pay as you go” meters exist for these utilities, so as with cell-phones, people can carefully control their

consumption. By 2003, 26 million of South Africa's 45 million people had piped water (Guest, 2004). In 2004, President Thabo Mbeki had promised that all households will have running water within five years and electricity within eight years. Sachs (2005) supports these "lifeline tariffs" for the poor in which a minimum of free water and power are guaranteed after which these resources are paid for on a metered basis.

Former all-white universities are opened to all races and special scholarship funds are being provided for scholars from low-income families to attend university. Therefore, it seems that to some degree, South Africa is marching to its own drums and not that of the West.

South Africa's biggest challenge is trying to find work for between 3.6 million (actively looking for work) to 6 million (includes those given up looking for work) people in 2001, a respective rise from 1.6 million (actively looking for work) to 3.2 million (active and given up) unemployed in 1994 (Guest, 2004). This will require a combination of training and Foreign Direct Investment (FDI), the same that is necessary for the entire subcontinent. Environmental Impact Assessments/Statements (EIA/EIS) must be part of the investment process to assure protection of the worker and natural systems (see Chapter 7, Section 7.8.3, Environmental Impact Assessment (EIA) Industry – No Hippocratic Oath). NEPAD must go hand-in-hand in addressing educational (see Chapter 11, Section 11.13.1, Education) and health issues (see Chapter 11, Section, 11.13.2, Health in Sub-Saharan Africa at the Beginning of The New Millennium). Additional political and technical challenges South Africa must overcome are summarized in Chapter 11, Section, 11.6.6.3, South Africa's democracy, a possible decentralized model adapted to Africa. It's free press, technological know how and economic diversity give one confidence that it will succeed.

13.15 NEED FOR THE WEST AND WTO TO LOWER TARIFFS, SUBSIDIES AND OTHER PROTECTIVE MEASURES IF NEPAD AND AGOA ARE TO WORK

Efforts to rectify trade imbalances should continue. As discussed in Chapter 12, current negotiations must eliminate the combination of agricultural protectionism and high subsidies in industrialized countries that have limited agricultural growth in the developing world, as well as weakened food security in vulnerable countries, by putting their domestic production at a disadvantage (Díaz-Bonilla & Robinson, 2001; Legum, 2002).

13.16 NEW MILLENNIUM CHALLENGE ACCOUNT

“On March 14, 2002, with the events of September 11 fresh in the nation’s mind in the midst of the war on terrorism, President Bush addressed the Inter-American Development Bank and announced the creation of a \$5 billion (over 3 budget cycles) Millennium Challenge Account. To quote from the President’s speech, ‘The growing divide between wealth and poverty, between opportunity and misery, is both a challenge to our compassion and a source of instability. Even as we fight to defeat terror, we must also fight for the values that make life worth living; for education and health and economic opportunity.’ The President was clear, however, that the new funds would be used for countries that root out corruption, respect human rights and adhere to the rule of law, as well as encourage open markets and sustainable budget policies” (Natsios, 2002).

Sachs (2005) maintains that to meet Millennium Development Goals, poor countries of the World need US\$ 100 billion/year between 2006 and 2015 (see Section 13.12.5, Poor Track Record in Achieving United Nations “Millennium Declaration” Goals). Similar to AGOA requirements, the President proposed three standards to judge this performance (Natsios, 2002):

- “The central importance of policies that encourage economic freedom, private investment, and entrepreneurship...
- The central importance of good governance to economic growth and development...
- The demonstrable commitment by Third World countries to invest in health and education and to ensure effective delivery of services. Countries with high rates of sustained economic growth have consistently invested in health and education services for their people, helping create a work force for a growing economy”.

President George W. Bush (2002) has acknowledged in a speech that poverty is broad and seemingly inescapable, leaving a dark shadow across a world increasingly illuminated by opportunity, with 50% of the world living on less than US\$ 2/day, with poverty increasing and per capita income falling in Africa and the Islamic world. The growing divide between wealth and poverty is both a challenge to our compassion and a source of instability. Poverty does not cause terrorism, most of the plotters of September 11th being raised in comfort. Yet persistent poverty and oppression can lead to hopelessness and despair and when governments fail to meet basic needs, failed states can become havens for terror. Development is not always easy, but the conditions required for sound development are 1) Security and 2) Financing, with most funds for development coming from domestic capital, from foreign investment and especially, from trade not foreign aid. Trade is the engine of development, helping to meet the needs of the world’s poor. Old models of economic development assistance are outdated, needing legal and economic reform, including an end to corruption, protection of private property, open markets (will the USA and EU open theirs?), appropriate monetary and fiscal policies and enforceable private contracts. Unless these reforms are in place, President Bush agrees that more aid money can actually be counterproductive, subsidizing bad policies, delaying reform and crowding out private investment. A new vision looks beyond arbitrary inputs from the rich and demands tangible outcomes for the poor. America supports the international

development goals in the UN Millennium Declaration and calls for a new compact for global development, defined by new accountability for both rich and poor nations alike. Greater contributions from developed nations must be linked to greater responsibility from developing nations. The new Millennium Challenge Account will help fight HIV/AIDS, bring computer instruction to developing nations, will assist African businesses to sell goods abroad, will provide textbooks and training to students in Islamic and African countries and will apply science and technology to increase harvests (Bush, 2002). It sounds good President Bush, but talk is cheap. We need to see action. So far, of the 10 to 15 countries expected to qualify, only three are from Africa: Uganda, Senegal and Ghana (Booker, Minter & Colgan, 2003; Booker & Colgan, 2004).

13.17 INTEGRATION OF SUB-SAHARAN AFRICA INTO THE INFORMATION AGE

“Africa provides the oil, helps us with human intelligence, helps with our access to the Middle East so we can have a forward presence. Our tradeoff has to be to help develop Africa with what makes our country work: transportation and information technology. That is the new deal I hope we can get out of this for Africa and the United States. That is where I think our national security interests are”. (Representative William Jefferson (Democrat-Louisiana) *In: AOPIG, 2002*).⁵⁷⁴

⁵⁷⁴ Although this statement makes sense, it should be noted that on June 4th, 2007, Congressman William Jefferson was indicted by the United States District Court on charges of racketeering (MSNBC, 2007; U.S. District Court, 2007), soliciting more than US\$ 400,000 (MSNBC, 2007) in bribes, wire fraud, money laundering, obstruction of justice and conspiracy (MSNBC, 2007; U.S. District Court, 2007) providing official assistance and using his staff and position as a U.S. Congressman to aid U.S. companies looking to do business (telecommunications, satellite transmission, sugar factory, oil exploration rights, fertilizer plant, waste recycling) in Nigeria, Ghana, Equatorial Guinea, Sao Tome & Principe, Cameroon, Botswana and Republic of Congo. In return, he is charged in seeking things of value such as “monthly fees or retainers, consulting fees, percentage shares of revenue and profit, flat fees for items sold, and stock ownership in the companies seeking his official assistance” (U.S. District Court, 2007).

Hoogvelt (2002 *In: Zack-Williams, et al.*, 2002) argues that Africa lacks the requisite infrastructure to enter into the information age and is thus excluded from the newest international division of labor. It is described how a doctor in America, using the internet, will have his correspondence and bank reports typed by a fleet of secretaries in India and receive the finished product via cyberspace. Many British Bank help lines use South Africans, costing 25% of a Briton, since their cost of living in dollar or pound terms is lower to achieve the same quality of life (purchasing power parity) or better (Guest, 2004). “There are more than 400 call centers in South Africa employing 80,000 people” (Commission for Africa, 2005). Many leading international companies, such as IKEA, Benetton and Nike, have global internets allowing them to subcontract economic activities to suppliers in a huge electronic market of suppliers.

Africans are fascinated by and very good at using computers, but Sub-Saharan Africa, other than South Africa, is currently switched off, though this is changing rapidly with internet cafes in many small towns (Hoogvelt, 2002 *In: Zack-Williams, et al.*, 2002).

This will require more than just sending children to school, but will require a major upgrade in the quality of primary and secondary school teachers and the materials made available to them, including linking children into the information age through the internet so that they grow up with information technology (IT). Currently, Africa is the least connected continent in the world with about 7 million internet users in 2002 compared to 10.5 million in Oceania, 35.5 million in Latin America and the Caribbean, 143.9 million in Asia (except Japan), 57.2 million in Japan, 166.4 million in Europe and 170.2 million in the USA and Canada (ILO, 2004).

This needs to change with a partnership from the West in helping to uplift Africa.

For those who fear that outsourcing will have a negative effect on America's economy, a study by the McKinsey Global Institute found that for every US\$ 1 outsourced, the United States gained US\$ 1.12 – 1.14, while the outsourced country captured just 33 cents of the total gain, thus a win/win situation for both economies (Bartlett, 2003).

Museveni and the U.S. Agency for International Development (USAID) administrator, Andrew Natsios, have signed a US\$ 14.3 million deal that would make Uganda the regional information technology center. The US\$ 14.3 million deal, which includes the establishment of ten network academies within Uganda's university system, is partially funded by the Leland Initiative; a U.S. Government effort aimed at connecting African nations to the Internet. An information technology partnership between the U.S. Government, Uganda and the private sector is helping President Yoweri Museveni position his country as a major player and regional center for the computer services market in Sub-Saharan Africa (Museveni, 2003b). South Africa is already there. "Senegal and Ghana have also opened some call centers in the past year" (Commission for Africa, 2005). Hamadoun Touré, secretary-general the U.N. International Telecommunication Union, expects IT companies to invest US\$ 300 billion in Africa's telecommunications industry over the next five years (King, 2007b).

13.18 SUB-SAHARAN AFRICA'S FUTURE

Africa is in a new political phase, variously referred to as a "second independence struggle", a "third wave" of change, or, as popularized by South Africa's then Deputy President (and in June 1999, President) Thabo Mbeki, an "'African Renaissance.'" A common theme throughout the continent today is that a critical mass of Africans is being organized with new dynamism, new demands and new

expectations. The current generation, which has come of age in the post-Cold War, post-Apartheid era, is determined to fulfill the promises of widely shared economic progress, democratic rights for all, and security that will enable ordinary people around the continent to pursue their own dreams in peace. It should be no surprise that the transformation of African national and state structures, still largely derived from colonial models, remains unfinished (IRC, 2001).

Cliffe (2002 *In: Zack-Williams, et al.*, 2002) provides examples of “African Alternatives” to the Western “Cookie-Cutter Approach” to multi-party structures of governance and so-called democracy, which are often at very superficial levels. Examples emerging out of liberation movements include Ethiopia, Eritrea, Rwanda and Uganda. Museveni’s no-party Democracy (see Chapter 11, Section 11.6.6.2, Uganda, democracy, civil war and attempts to find an African solution) and South Africa’s decentralized system of governance (Chapter 11, Section 11.6.6.3, South Africa’s democracy, a possible decentralized model adapted to Africa) are attempts at finding an African solution to governance.

Success will also depend in large part on whether African realities and priorities are recognized in decision-making arenas in multinational and rich-country institutions (IRC, 2002).

While there are many initiatives, including human rights, social justice, peace and economic development leading to sustainable and equitable improvement in the quality of African life, they are not yet coherent enough or powerful enough to break through the old patterns of how the outside world deals with Africa. There is a pervasiveness of simplistic stereotypes and one-size-fits-all remedies. What is indispensable for constructive outside involvement is a greater sensitivity to the diversity and complexity of African realities. Achieving economic growth is

indeed indispensable for achieving other goals, requiring greater competitiveness and freedom from inefficient or corrupt bureaucratic restrictions. Growth will be neither sustainable nor fair unless it (IRC, 2001):

- Is directed toward job creation and poverty reduction;
- Produces for domestic and regional consumers and not only for international markets;
- Is under girded by public investment in health and education; and
- Is protected from abuse of worker rights (with salaries that are adequate enough to help create a blue collar middleclass, while still providing adequate profits to the private sector) and the environment (worker environment, land, water, air, groundwater, etc.).

Market integration - without other structural changes (e.g., industrialization, road and other infrastructure, investment incentives such as good governance, investment security, free flow of FOREX and reasonable employment laws) - leaves Sub-Saharan Africa dependent on a small number of export commodities – mostly raw, deeply in debt and capable of attracting only a small fraction of world investment capital (IRC, 2001).

Sub-Saharan Africa's economic output, measured by its “equivalent purchasing power⁵⁷⁵“, is the smallest of any developing region. High growth projections assume the economy expands at 4.5% annually, the low growth projections at 2% annually (CALTECH, 2002). Under the optimistic high growth projection, the region's economy in 2050 would be about the same size as the current U.S. economy. The region's prosperity or average annual income (as measured by per capita GNP), even in the best case, is unlikely to reach \$6,000 per person (with

⁵⁷⁵ Purchasing power of money is measured by the quantity and quality of products and services it can buy, also called buying power. Compares relative buying power of incomes between countries.

high economic growth and low population growth). In the worst case, with slow economic growth and rapidly rising populations, average incomes might actually decline over the next 50 years (CALTECH, 2002).

As Natie Oelofse (*pers. comm.*)⁵⁷⁶, a well known safari operator, said while being treated for cancer, “No doctor can tell you that your time is up. That’s between you and God”! Economists are notorious for widely varying projections. Africa’s people and God, along with its traditional beliefs, will determine the future of the continent. A development pyramid with health and education as a base backed by transparent, representative and accountable governments, along with an economy driven by the private sector can likely adjust these figures to much higher. Revolutions and paradigm shifts can occur and this is what it will take, a technological and ideological revolution, if the economies and quality of life in SSA are to significantly change for the better.

13.18.1 Going Local Where Necessary, Development of Regional Markets

Just as in the USA and Europe, there may be certain local industries, which are labor intensive that need protection. The recent refusal of South Africa in July 2003 to allow the USA to dump subsidized food into RSA as part of a free-trade agreement is an example of protecting South Africa’s farm economy and its and the region’s food security. Unfortunately, by mid-2004, South African importers were bringing in wheat from the USA cheaper than their own farmers could produce it. This is likely based on both production and export subsidies in the USA (see Chapter 12, Section 12.2.4, Agricultural Tariffs and Subsidies) adversely impacting global grain prices, even if the food is not dumped as in the

⁵⁷⁶ Natie Oelofse, Managing Director, Wengert Windrose Safaris, Arusha, Tanzania, natie.oelofse@tgts.com. Passed away in June 2005 from cancer.

U.S. PL-480 Food for Peace Program (see Chapter 11, Section 11.8.3.1, “Food for Peace” or “food for poverty”, Western donor impacts on food production and wildlife management in Laikipia Kenya and Section 11.8.8, Food Aid and Impacts on Grain Production in Southern Africa). In a purely free-market, non-subsidized South African farmers cannot compete against subsidized American farmers in the international market and are thus out-competed in their own country.

Some people say going local does not mean walling off the outside world. It means nurturing businesses that use local resources sustainably, that employ local workers at decent wages (e.g., creates a blue collar middleclass) and that serve primarily local consumers (Legum, 2002). It means becoming more self-sufficient and less dependent on imports (Dumont, 1966). An excellent example in 2003 is the company in the Free State that manufactures labor-intensive gold jewelry. In the past, raw gold was shipped to Italy, made into jewelry and then shipped back to RSA for sale to South Africans and tourists. Today, the added value of transformation is beginning to stay in South Africa (see Chapter 12, Section 12.9, THE WAY FORWARD and Section 13.13, TRADE NOT AID). South Africa, because of its historical past (sanctions associated with Apartheid), has many similar industries from clothes to arms and automobiles being manufactured for local, regional and international consumption. The rest of Sub-Saharan Africa needs to take note.

It also means that the rest of Sub-Saharan Africa needs to develop industries to serve the region and which transform its raw products on the subcontinent and employ its people.

“Sub-Saharan Africa is the world’s most fragmented region. It is demarcated by 165 borders into 48 countries—22 with less than 5 million people, 11 with less than 1 million. Small size imposes real

constraints on development, and without economic cooperation and integration Africa will fall further behind the global frontier” (World Bank, 2000) (see Chapter 12, Section 12.3.4.1, Downsizing Governments).

Sub-Saharan Africa has one of the poorest records of regional trade as a means of improving the subcontinent’s economies; 5.3% of GDP compared to 26.5 for East Asia and the Pacific, 15.3% for Europe and Central Asia, 6.4 Latin America and Caribbean, 3.5 Middle East and North Africa and 0.8 South Asia (Commission for Africa, 2005).

A number of regional organizations are evolving in Sub-Saharan Africa that are developing free-trade as a means of developing regional markets. Kousari (2004) believes that enhancing south-south trade in particular, in non-traditional commodities, such as fruits, vegetables, fish and other seafood, and increasing exports to emerging markets are avenues for enhancing Africa’s trade diversification. The need to enhance intra-African trade is among the main objectives of NEPAD. The International Food Policy Research Institute (IFPRI) has identified more than 250 agricultural goods for which one or more Sub-Saharan African countries have a comparative advantage, 33% (1/3rd) of which are goods of which other African countries are importers. Given that 25% of Africa’s cereals are imported, increased intra-regional trade could encourage increased agricultural production and assist in partially alleviating Africa’s food security. Kenya has for the past decade imported grain from Uganda and Tanzania during periods of drought (Commission for Africa, 2005).

Leistner (2004) notes that most African national economies are individually small and weak, but if properly organized into regional groupings they have the potential to become economically viable as espoused by the UN Economic Commission for Africa (ECA) (see Chapter 12, Section 12.3.4, Structural Adjustment, U.S. Movement to Control Developing Economies and Section

12.3.4.1, Downsizing governments). According to the World Bank (2005), these regional economic communities have shown limited ability to benefit from

“regional approaches to build and maintain infrastructure in key trade logistic corridors, to create common institutional and legal frameworks in such areas as customs administration, competition policy, and the regulation of Common Property Resources (such as fisheries), and to develop solutions to trans-border problems in health”.

It would appear that there is much overlapping (Commission for Africa, 2005) and in some cases, especially in East and Southern Africa, a need to consider consolidation of these organizations and the treaties that created them.

If current inequalities in the global distribution of income continues, where the richest 1% of people in the world continue to receive as much income as the poorest 57% (Booker & Minter, 2001), efforts to stop the “illegal” flow of immigrants from the South (And East) to the North will fail. They will bring with them many of the problems of the developing world, including poverty, and increasing costs to the north to deal with health care, education, housing and crime. Terrorism will be hiding in the shadows of every suburban home in Europe and North America. The rich will live in fear within security compounds cordoned off with razor wire and supported by heavily armed rapid response security teams, prisoners of their wealth. The global society has a choice, either we all work to make the world a better place for mankind, or mankind and modern civilization will be dragged under by the mass of poverty that greatly outweighs the few with wealth.

13.19 CONCLUSION

Modern communication and transportation is accelerating the rate at which globalization is taking place. Globalization to date has not been kind to Sub-Saharan Africa. Linked to the last two chapters, foreign aid and structural adjustment have been used by Western governments to ease the access for their multi-/trans-national corporations to plunder Sub-Saharan Africa's raw products in order to drive their economies.

A 2007 report by Thomas Carothers of the Carnegie Endowment for International Peace, best sums up the current situation both globally and in Sub-Saharan Africa, especially with regard to U.S. policy that tends to impact upon the policy of other global players such as Europe and China. Under the George W. Bush and William (Bill) Jefferson Clinton administrations, the U.S. lost credibility as a symbol of democracy and human rights, sacrificing democracy in favor of economic and security interests, reminiscent of friendly relationships with autocratic governments during the Cold War as "bulwarks against Communism or lucrative trading partners". Based upon the ideology of the "war on terrorism", and "oil" for U.S. energy companies, the Bush Administration has strong ties to 50% of the 45 "non-free" countries in the world (e.g., Pakistan, Saudi Arabia, Egypt, Nigeria, Ethiopia, Rwanda, Mauritania, DRC, Chad and Angola). Hypocritically, it has a "get tough policy" with dictatorial regimes, such as Belarus, Burma, Cuba, and Zimbabwe where it has no significant interests in oil or anti-terrorism cooperation. Closely associated with the Bush style promotion of democracy is military support, intervention and regime change (Iraq, Afghanistan, DRC and Somalia). The United States as a stalwart of human rights has been tarnished by its hypocritical stance supporting human rights, but on the other hand for abuses of detainees and prisoners in Iraq, Afghanistan, and Guantánamo; secret CIA prisons; unauthorized domestic eavesdropping, and stripping away rights of

designated “enemy combatants” (Carothers, 2007) in the name of the war on terror. Unless the next U.S. administration changes these policies, it bodes ill for Sub-Saharan Africa, with the likelihood of continued support for undemocratic governments in the name of oil and anti-terrorism, and the use of AFRICOM to train proxy armies to undertake U.S. bidding in order to achieve these objectives regardless the cost to lives or freedom; the Cold War now being turned into both an economic war, and another ideological war that will not be won using force. Terrorism has been around since the beginning of humanity. It is how the weak have stood up to abuse by the powerful, and can only be overcome in developing win-win relationships with the rest of the world.

Since the end of the Cold War, where millions died over ideological wars – which could be argued were also resource wars - millions more people have died because of factional fighting between various groups over accessing Sub-Saharan Africa’s vast mineral wealth; in Angola, Congo Brazzaville, Liberia, Sierra Leone, Sudan and the Democratic Republic of Congo just to name a few of the countries. The conflict in the Democratic Republic of Congo was considered Africa’s first “World War”, as Uganda, Rwanda, Zimbabwe, Angola, Namibia, Chad, Libya, as well as the U.S. and France along with their multi-nationals were drawn into supporting various factions with the promise of booty futures.

Western countries and multi-nationals have fueled the fire, providing warring factions financially and technically, and with armaments. If controlled, the breakdown of governance, with various factions holding mineral rich territories, often facilitates the extraction of natural resources at maximum profit. This is good capitalism in the purest sense, since it is cheaper to pay off a puppet president and a few generals, or rebel leaders than an entire country. Profits destined for local factions and/or governments are often used to purchase arms to prolong the fighting. In addition to abundant mineral resources, foreign aid grants

and loans often allow governments to shirk their responsibilities to their citizens and use what little wealth is generated for building up armies that consolidate their power and ability to plunder the wealth of their country, instead of investing in a healthy educated society that can integrate into a global economy. This de-linking of the political elite from their constituency is also an incentive to “mine” renewable resources such as timber, wildlife and fish for short-term gains – money in the bank for the elite, and/or survival for the poor.

There is some concern that many of Sub-Saharan Africa’s leaders and the West may not want an educated populace that will demand accountability from their governments and access to control, management and the right to economically benefit from their resources, while allowing government to generate income from taxing them, as opposed to stealing all their wealth and maintaining them in a state of misery. In other words, there is concern that all of this talk about development and democracy is a façade of the elite and nothing will change. We, the global society, must hold Western and African governments and multi-nationals accountable for their actions until they prove to us that they are willing to do what is right for mankind and even then, they will need monitoring by some of the NGO watchdogs.

There are proposals on the table to change these relationships, to turn them into a win/win situation instead of win/lose relationships. AGOA, Everything but Arms (EBA), NEPAD and the new Millennium Challenge Account are proposals, among others, attempting to move in this direction, to begin helping Sub-Saharan Africa industrialize and transform its resources in Africa. Let us hope these are not “wolves in sheep’s clothing” which end up causing pollution, paying slave labor, mining Sub-Saharan Africa’s rich resources, and end up being more of the same old failed Washington Consensus structural adjustment policies that stimulate Western economies at the expense of African economies. It is

imperative for Sub-Saharan Africa's people and their natural systems that this transformation takes place. The 2002 launched "The Publish What You Pay" coalition of more than 190 Northern and Southern NGOs that is calling for legislation to require extractive companies to disclose their payments to all governments, can result in accountability and transparency if properly implemented.

Ultimately, unless Sub-Saharan Africa evolves beyond a subsistence economy and a majority educated middleclass is created, the Western export of free-market democracy, which often places an impoverished majority in control of "market dominant minorities", is a recipe for turmoil and destruction. Much of Sub-Saharan Africa is faced with this scenario, where politics becomes broken along ethnic and religious lines in declinining and/or stagnating per capita economies: the Lebanese economic elite in West Africa, the Indian elite in East Africa, the whites in Southern Africa, Tutsi elite in Rwanda and Burundi, the urban capitalist Kikuyu elite of the Kenyatta era and Kalenjin favored under Moi in Kenya.

It is just as important for the future of Western civilization. 911 should have been a wakeup call to the West that their way of life will have a difficult time surviving if it is on the backs of the rest of the World. Poverty does not create terrorists – that is a falsehood and a smear (Bay, 2002).

"However, theft of wealth and development denied inevitably seeds resentment, the spark terror's masters know how to stroke. Corruption and stolen opportunity stalk the streets and hard corners where terrorists recruit. Globalization if properly applied can be a means of relieving mass endemic poverty and a key to defeating terrorism" (Bay, 2002).

The status quo in how the West has dealt with Sub-Saharan Africa to date was not sustainable in the Deep South of the U.S., nor in Apartheid in South Africa and in

a global society it will not be sustainable for a few predatory countries to feed off the majority. It must be win/win for everyone.

A third reason why it will be important for the West to help Sub-Saharan Africa in its transition into an industrialized society is that this will help create a middleclass that has the luxury to develop a modern environmental conscience. If the majority of Africans remain poor and uneducated in trying to subsist, the risk is that in 50 years “Wild Africa” as we know it today (and it is already fleeting, along with its charismatic mega-fauna), may be no more. Thus, industrialization will not only take pressure off the rural resource base through urbanization, but will help spur the development of an African environmental movement, with African solutions that hopefully will not alienate, but integrate those who choose to retain rural lifestyles from economic benefits derived from the sustainable management of “their” natural resources. This cannot happen too quickly.

This means good governance and accountable governments, or as Collin Powell said, capital is a “coward” that shuns uncertainty and crime. It flees war and disease and it won’t go near corruption.

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Chapter 14

14.0 SUGGESTED ROADMAP FOR THE WAY FORWARD

14.1 INTRODUCTION

Sub-Saharan Africa has among the highest population growth rates in the world, increasing on average 5.5-6.5 times in the 20th century and expected to increase up to another 2.8 times to about 1.8 billion people by 2050. Meanwhile, Sub-Saharan Africa's cattle population doubled from about 104 million in 1961 to 208 million by 2003, while the overstocking rate in 1986 in many places was already 50 to 100%. Only about 27% of Sub-Saharan Africa (\approx 600 million ha) is conducive to sustainable low-input agriculture and/or commercial high-input agriculture that can potentially feed the growing urban masses on the continent. About 70-75% of Sub-Saharan Africa (SSA) is comprised of savanna biome. Its best land use is as pasture for wildlife and livestock, but while marginal, is increasingly being used by itinerant farmers in search of new lands as fallow periods disappear across the subcontinent. Between 1961 and 1999 in Sub-Saharan Africa, land expansion accounted for 35% of increases in crop production. About 353 million people, 46% of Africa's population, are living on moderate to low potential agricultural lands. Most of this is in the savanna biome of Sub-Saharan Africa, resulting in severe environmental degradation and a zone of conflict from Senegal to Sudan along the Sahelian/Saharan borders. How did Sub-Saharan Africa end up in what appears to be an ever downward spiral, ecologically and economically, and how can the continent escape this death trap?

14.1.1 Co-Evolution of Africa with Wildlife

Sub-Saharan Africa is the “Cradle of Mankind” where 1.8-1.6 million years ago the progenitor of early man *Homo spp.* arose slowly, spreading across the world. The “out of Africa” theory, based on genetic DNA (Deoxyribonucleic Acid) coding analyses has it that evolutionary divergence took place in response to the expanding Sahara desert, which acted as a genetic isolating barrier. By around 100,000 years ago, several species of hominids populated the earth, including *Homo sapiens* in Africa, *Homo erectus* in Southeast Asia and China, and the Neanderthals (*Homo neanderthals*) in Europe. By around 30,000 years ago, the only surviving hominid species was *H. sapiens*. Researchers place the timing of human’s (*Homo sapiens*) one time movement out of Africa as between 80,000 and 45,000 years ago from Africa across the Red Sea into modern day Yemen, differentiating into the various races at a later date. They took a southern coastal route through South Asia (modern Pakistan/Arabian Gulf) with entry into Europe from South Asia about 50,000-35,000 years ago. An earlier attempt via a northern route out of Africa into the Levant (Israel and the Near East) failed as the earth entered into a period of glaciation causing North Africa and the Levant to enter into a period of extreme desertification.

Africa is the only continent where man co-evolved with wildlife. In the rest of the world, there were major extinctions of mega-fauna during the Pleistocene, coinciding with the arrival of man:

- The first wave of extinction, with man moving out of Africa on foot from 100,000 – 30,000 years ago.

- The second wave of extinction out of Asia into North and South America by foot and the Pacific, Australasia and Madagascar by raft from 30,000 to 1,000 years ago.

In recent times there has been a third wave of extinction out of Europe on sailing ships about 1500 – 1840 A.D. and again by rail, steamship, motorcar and plane from 1840 – 2000 A.D. (today), resulting in the wholesale removal and/or modification of habitat, continuing today and compounded by the global population explosion, and in the case of Africa linked to poverty, subsistence lifestyles and centralization of land/resource tenure.

14.1.2 Man the Hunter

Man's evolution into the hunter or "super predator" is believed to have had much to do with the development of who we are, setting man apart from all other animals. Man is the only primate who became dependent on meat for survival. Hunting impacted man psychologically, socially and territorially. This included speech, the development of weapons to overcome human frailty necessitating bipedal movements, speech and facial expressions needed for cooperative hunting, organization into hunting bands, territoriality and sexual division of labor to allow for the prolonged childhood linked to extended development of the brain and increased intelligence, pair bonding and eventual development of modern societies. It is not until about 5-10,000 years ago that man began entering into agriculture as an alternative to hunting and even then, hunting has always been a supplement to that which is grown on the land and/or taken from domesticated livestock. Hunting, both as a means of survival and as an urge that must be fulfilled, is still a strong part of man and his character as we enter into the 21st century A.D.

14.1.3 Pre-Colonial Civilizations

Prior to the coming of the European settlers to Africa, rich and varied cultures existed, from Ancient Mali and Songhay, where cities such as Djenne and Timbuktu had Islamic universities by the 16th century, to the Bakongo kingdom where ambassadors were sent to both Spain and the Vatican and a Papal Nuncio resided in Mbanza in the 15th century A.D.

Substantial, but controversial evidence exists that early civilization as known to mankind began in what is now lower Egypt/Ethiopia/Sudan, making major contributions to the arts, religions, agriculture, social organization, medicine, writing and architecture that gradually spread to Europe and Asia. This civilization was black in origin, gradually interbreeding with other races, especially whites as the region was invaded by outsiders. West and Central African ethnicities such as the Wolof, Serer, Fulani/Peul, Toucouleur, Serer, Fang, Yoruba and Bamum, are believed to have originated from the Nile Basin based on morphological, biochemical (e.g., melanin), linguistic, cultural (e.g., matriarchal societies, kings, circumcision), historical (e.g., Greek and European historians, logs of early European navigators/explorers, Arab and Egyptian translations, Biblical and Koranic writings), archeological, architectural, artistic and religious (e.g., similar gods, totems, ancestor worship) information and ties. The ancient empires of Ghana, Mali, Gao, Yatenga/Mossi and the kingdoms of Djolof and Cayor (both in Senegal) can also be traced back to having Egypto-Nubian roots.

By about 4,000 BC, gradual desiccation of the Sahara pushed people south and west into wetter regions. At about the same time (3,000-4,000 BC), domestic cattle also spread south of the Sahara and supplemented subsistence hunting and

fishing. By 2,000 BC, agriculture appeared in the Sahel, occurring conjointly with the drying of the Sahara area, forest retraction and a human ebb towards a more favorable zone. Sedentary agriculture developed through the domestication of both African cultivars (e.g., sorghum, bulrush millet, finger millet, African rice, and ignames) and introduced food varieties (bananas, coconuts, the root crop taro from South Asia and corn and manioc from the New World). The change from gathering to food production allowed human populations to significantly increase and to shift from a nomadic to a settled life. Food surpluses allowed the development of non-food producing specialties from war-making and statecraft to art. Sedentarization intensified during the first millennium (1,000 BC) through the combined action of collectors, fishermen, cattle raisers, cultivators of long-fallow fields and blacksmiths.

By about 3,000-1,000 BC, continued drought and desertification began forcing people to search for a more amicable climate, resulting in a southward agricultural movement. The focal point of this migration was from the central Benoué River Valley of Cameroon and Nigeria. They did not move across East and Southern Africa in large numbers, but in small lineage groups. Their economy was based on “shifting cultivation”, also called slash and burn or itinerant agriculture. As population pressures built up and nutrients were leached out of the soils, they may have been forced to move in search of new land.

The iron-using Bantu used wooded environments unavailable to the pastoralists because of sleeping sickness carried by the tsetse fly and in an almost symbiotic relationship, created grasslands through fire and bush clearance, which in many cases were gradually taken over by pastoralists. This interface between pastoralists and agriculturalists meant acceptance of economic activities across cultural boundaries. It is believed that the most likely movement of livestock along with iron-using agro-pastoralists from East to Southern Africa took place in

the inter-lacustrine area of East Africa and the movement of agropastoral people down through the tsetse-free corridors of the Tanzanian Highlands and Malawi to Zimbabwe and the Transvaal of South Africa.

Gradually the Bantu language dominated East and Southern Africa. It is believed this is because they were technologically superior compared to pastoralists, Pygmies and Khoisan hunters and gatherers. “Bantuization equaled urbanization” where they lived in compact settlements which these other groups visited for trading purposes, many of whom were absorbed through marriage and/or began to speak the Bantu languages.

The deserts of the Karoo and Namib did not allow traditional agriculture, eventually becoming a safe haven for the Bushmen who were pushed aside by the Bantu migrations, while Pygmies escaped into the then impenetrable tropical lowland forests of Central Africa.

The most advanced southern movement of Bantu coming out of Central Africa were the Xhosa who were forced to stop at the Fish River (between 1702 and the mid-1700s), having only summer-rainfall crops (e.g., sorghum, millet and yams from Central/West Africa and bananas from Asia, etc.). The Afrikaner, descendants of the 17th century Dutch/Huguenot immigrants (arriving in Capetown in 1652), brought with them Mediterranean winter-rainfall crops such as wheat and barley, adapted to the temperate climate of the Cape of Good Hope where they initially settled. By the 19th century, the southern migrating Bantu Nguni-speaking Zulu headed by Shaka, would clash with the northern migrating land-hungry Afrikaner trekboers. Shaka’s militaristic approach to absorbing other groups would eventually be felt as far away as southern Tanzania where Nguni groups settled, some believe linked to a movement out of Southern Africa caused by a population explosion.

14.1.4 Traditional Governance and Management Systems

In pre-colonial Sub-Saharan Africa, human and livestock populations were low and wildlife populations were high. There was less need to intensively manage wildlife as there is in the 21st century.

Small-scale rural societies practiced both governance and natural resource management at a very localized level. Traditional African society was highly democratic. Very often chiefs would be deposed or killed if too autocratic or if they failed to meet the expectations of their people. Zulu kings could not make laws without the consent of their councilors (*indunas*). Similarly, in many Bantu cultures, the local chief could not make key decisions without agreement of elders/headmen. Western style winner-take-all voting, in which the majority could impose itself on a minority, was a foreign concept to Sub-Saharan Africa.

Natural resources were managed as “common property” resources for the good of the greater community. Chiefs, elders and hunting guilds carefully controlled access to natural resources, including agricultural land, pasture, wildlife, tree products, fish, wild medicines and honey. Taboos determined protected species not to be hunted, and thus others that could be hunted. The ancestors and spirit world were consulted through chiefs, spirit mediums and master hunters to assure a safe and successful hunt or harvest. Ultimately, by means of culture, taboos based on religion and traditional value systems, local rules and regulations enshrined in farming practices, land tenure systems and folklore, indigenous Africans protected and conserved ecosystems and their associated biodiversity. Territory and mobility were also key components to these management systems.

Wildlife and other resources were high relative to the human population, negating the need for the intensive management that is necessary to assure sustainability in

the 21st century. While the majority of wildlife was harvested for meat, game also served a multitude of purposes, including sport and commercial uses. Human populations were low relative to the game and the weapons were relatively primitive (e.g., poisoned bows and arrows, crossbows/*arbaletes*, game pits, dead falls and much later, blackpowder muskets) so that the above traditional controls, with few exceptions, were more than adequate to assure sustainability.

Rules and regulations regarding access to natural resources were precise and codified, although not written down, and had been enforced since time immemorial. The result was sustainable exploitation of natural resources. This had been accomplished with no ecological purpose in mind, as we understand it, but out of sheer instinct for self-preservation. Conservation of game animals and fish was necessary in order to provide for future survival. The norms and morals of hunting helped reinforce the norms and morals of these rural small-scale societies.

14.1.5 The coming of the European to Sub-Saharan Africa

The harshness of the European climate that encouraged conquest, accumulation (materialism) and continued technical progress as survival mechanisms, eventually gave Europe superiority over Africa, while the search for riches (e.g., gold and ivory) as a means of accumulation and the need for slaves to fuel the economies of the New World provided it with justification for colonization.

One of the worst tragedies in modern history was the supplying of slaves to the plantations of the New World. It is estimated that approximately 50 million Africans were torn from their motherland and taken to the New World, the majority dying along the way (10-11 million surviving), as unwilling instruments in laying the foundations for Western capitalism. In fact, Europeans often acted as

junior partners to African rulers, merchants and middlemen in the slave trade. Unequal exchange became characteristic of international commerce, with Sub-Saharan Africa always at a disadvantage. African wealth, from human beings to crops and precious minerals, was exchanged for worthless articles like trinkets, mirrors and beads. Raw materials were transformed overseas and sold back to Sub-Saharan Africa for profit.

The establishment of ecology as a formal science occurred around 1866. Ecological Imperialism suggests superhuman achievements of European expansion into the colonies, which brought with it the imposition of values and management systems based on the Linnaean classification of plants and animals and the concept of reserves and parks (i.e., preservation), which separated man from nature. Indigenous management systems and knowledge were ignored.

Imperial settlers were hardly aware of the manipulation of nature by indigenous peoples. They assumed that the landscape they encountered for the first time was untouched “virgin” territory, “almost fresh from the Maker’s hands”. From the first day of their encounter, Europeans affirmed the principle of their superiority over the black race. They forced Africans into servitude and slavery, justified on the basis of superior strength. To open markets for their trade in Sub-Saharan Africa, they stamped out the last vestiges of African civilization – traditional trade, production and management systems. European visions of landscape, nature, technologies and culture were imposed on Africa as though it had no past, with the only future being one of Western civilization. North, Central and South American civilizations would suffer similar consequences with the coming of the Spanish *conquistadores*, and eventually French and English traders, fur trappers and settlers.

The landscapes of Sub-Saharan Africa were recreated to fit the geometric and orderly mindset of the European, from rectangular fenced farms, “Sherwood forests” in the forms of parks and game reserves to governmental structures that either co-opted or obliterated traditional means of governance, whichever suited the conqueror. European individualism and materialism was imposed on communal societies where resources and land were borrowed from the ancestors and survival and improvement of the group was more important than that of the individual. This set the stage for a conflict of cultures and ideologies that are still playing themselves out at the beginning of the 21st century.

The gun and the Bible served as the basis for European conquest in Sub-Saharan Africa. Wildlife served as a tool of that conquest; initially ivory, skin and meat fueling colonial economies. In many cases, Europeans and co-opted Africans hunted side by side in this plunder. Wildlife was greatly reduced and in a number of instances, shot to extinction and pushed out by European livestock and the creation of European landscapes. A similar history played itself out in the conquest by Europeans of North America and the “Red” Indian:

- Bluebuck of South Africa was extinct by 1800;
- Quagga was extinct by about 1870;
- In the 1700s, there were 500,000,000 springbok between the Karoo and the Kalahari Desert that migrated in herds of up to 10,000,000 animals. The great migrations were nearly finished by 1896; victims of guns, clubs and the cows/sheep that devoured their pasture;
- Elephant populations were reduced in South Africa (RSA) to 12 by the 1920s, to <4,000 by 1900 in Zimbabwe and 300 in Namibia by 1900. When the European first made contact with Sub-Saharan Africa about 300 tons/year of ivory was exported, rising to 500 tons/year by 1800 and 1,000 tons/year under white rule by 1914;

- White Rhino (RSA) reduced to 20 by 1895 in South Africa;
- Cape Mountain Zebra reduced to 400 by 1922 in South Africa;
- Bontebok reduced to 120 in 1927 in South Africa;
- Black Wildebeest reduced to 550 by 1890 in South Africa;
- Between 1937 and 1939, 200,000 elephants were killed in the Belgian Congo (today's the Democratic Republic of Congo) for ivory;
- As late as 1953, 750,000 skins, chiefly duiker, were exported out of the French Union in Africa with an average of 2 million duikers killed annually for their hides in Francophone Africa south of the Sahara;
- In Tanzania from 1903-1911, a total of 256 tons of ivory was exported, representing approximately 1,200 to 1,500 elephants killed/year in addition to an unaccounted amount smuggled in order to avoid the 15% export taxes; and
- During this same period, 53 tons of rhino horns were exported from Tanzania, representing 2,000 to 2,300 rhinos shot/year.

Once the conquest was over and Sub-Saharan Africa and its people subdued, the culture of hunting in Europe was turned into part of the culture of European Imperialism. The Colonial Masters of England, France, Belgium, Portugal and Spain in 1900 signed the first international conservation treaty, "The Convention for the Preservation of Animals, Birds and Fish in Africa". The goal of this treaty was to save African wildlife for hunting by royalty and upper class Europeans, as well as to place control of the ivory trade in the hands of the Europeans. Traditional hunting was for the most part outlawed, turning rural Africans into poachers. Conservation in Sub-Saharan Africa became a bastard product of a union between one thousand years of Anglo-Norman game keeping and 19th century economic imperialism. Initially, the economic incentive to preserve game was directly tied to a desire to secure monopolies over ivory trading. The outward form of the laws was English (European) history repeated. Instead of a

Royal House and aristocracy enforcing their will on lowly Britons (Europeans), African laws regulated the sport of imperial gentlemen at the expense of the indigenous people. The “Sherwood Forests” of England became the parks and hunting blocks of Africa. Traditional hunters/resource users became poachers, the “Robin Hoods” of Sub-Saharan Africa.

Some of the oldest game reserves in Africa are Groenkloof of 1822 and Knysna of 1856 in the Cape Colony, the Transvaal (now part of KwaZulu-Natal) Pongola Game Reserve of 1894 and the Tsitsikamma forests in 1886 in the Cape. In 1933, an International Conference for the Protection of Flora and Fauna of Africa held in London, laid down the principles on which national parks were to be established, which were based on a preservationist natural regulation philosophy. The oldest African park, Albert National Park, was established in Belgian Congo (today's the Democratic Republic of Congo) in 1925 to protect the mountain gorilla. The Sabi Game Reserve established in 1898 was rechristened Kruger National Park in 1926, the first national park in Anglophone Africa. The creation of game reserves, national parks, native reserves and European plantations created the tripartite division of land use separating whites, blacks and game. This is most evident today in South Africa, where wildlife is fenced in on game reserves, parks and game ranches almost exclusively for whites, while blacks are still, for the most part, economically fenced out. Africans, who had co-evolved with the mega-fauna and were an integral part of the subcontinent's ecosystems suddenly found themselves excluded:

- Africans have helped maintain savannas through fire, harvesting of wood for firewood and charcoal, itinerant agriculture and grazing of their livestock;
- Dense tropical lowland and afromontane forest biodiversity is increased by activities such as pit-sawing, itinerant agriculture and honey collection;

In recent times, resource managers realize that this exclusion is having major ramifications. This includes bush encroachment such as the loss of habitat for roan and sable antelope in northern Kruger National Park, South Africa, as forests close in and the loss of periodic openings from pit-sawing to provide the vegetation fed on by gorillas, having become critical with the disappearance of the forest elephant in Bwindi National Park, Uganda.

Ultimately, the introduction of modern-day medicine and veterinary care without concurrent education resulted in a human and livestock population explosion in the 20th century. In Sub-Saharan Africa, human populations increased from about 96-114 million to 622 million people between the years 1900 and 2000. Livestock populations (e.g., cattle, sheep, goats, horses, asses, mules, pigs and camels) increased from about 276 million in 1961 to over 622 million by 2000. This was exacerbated by a failure to modernize, necessitating large families as inexpensive labor under subsistence economies and as retirement insurance in old age. At the same time, introduced diseases such as rinderpest decimated wildlife.

Very often, political and civil rights were accorded to an elite group of Westernized Africans. The creation by colonial powers of this “tiny administrative African elite” and their secluded privileged existence isolated from the mass of poverty stricken peasants was a form of “Apartheid”. This brought along with it disenfranchisement of rural Africans from their natural resources, as the crown and then nationalization by the state at independence took over ownership of rural Sub-Saharan Africa’s wildlife, timber, soils, minerals, etc. and associated economic benefits, often reinforcing and strengthening what had begun under colonialism. It took “Common Property Resources” that were sustainably managed for hundreds of years and turned them into “Open Access Resources” centrally controlled by the state, belonging to everyone, but the responsibility of no one but the *petite bourgeoisie* who lacked the political will and the means to

sustainably manage Sub-Saharan Africa's natural resources without the support of alienated rural communities. Conservation equated to policing against rural resource users. This forced Africans into a perpetual state of poverty, keeping them backward and in a subsistence mode of existence.

To place what happened in perspective that a modern reader can understand, consider the following scenario. If tomorrow, the government took ownership over your home and property, but allowed you to continue living there, would you reinvest in the maintenance, let alone the improvement of your home? The answer would be no. What would you do if tomorrow the same government contended that your business resources therein also belong to them and any income from sales will go to the government, but the government will graciously provide you with some income to survive? Thus, your resources become public commodities over which you have little or no control, "Open Access", belonging to everyone, but the responsibility of no one but the bureaucracy. As soon as the government bureaucrat left, you would gather up as many resources in your business and on your property as feasible and black market them, even at undervalued prices, and keep what you could get for yourself and family without declaring the sales to the government. Does rhino horn, ivory, lion/leopard skins or the bushmeat trade ring a bell? Should we expect anything else? No, as we would do the same if placed in their shoes. Thus, this is what colonialism and centralization of land/resources at independence did to Africa's people and their relationship to resources that they had sustainably managed for thousands of years. The population explosion of the 20th century only exacerbated the problem, but was not at the root cause of the problem; land and resource tenure was.

14.1.6 Nation Building

Colonial policy tended to be that “nation building” was something beyond the capacity of Africans themselves. Historical African political communities were dispossessed by the European colonial powers as being uncivilized, unfit and incapable of self-government; a continent, which prior to the arrival of the European, was without a history of state and society. Africa’s rich pre-colonial history of well-ordered societies and complex inter-communal relations was ignored in favor of a European model.

The 50 or so states of the colonial partition were governed as though their people possessed no history of their own and became nation-states formed and governed by a political elite on the European model, mainly of Britain and France. Thus the development of “The White Man’s Burden” equipping arbitrarily constructed societies with European-style, political, social and national institutions.

The rural masses, who were often isolated from and segregated by this system, were herded like cattle and compressed into homelands unable to ecologically or economically sustain them in order to make way for colonial settlers or parks and protected areas. They were forced into “slave labor” for plantations and mines and/or to produce cash crops for the colonies. Thus, two different worlds were emerging, a dichotomy of an urban elite linked to Europe, and the rest of Sub-Saharan Africa.

14.1.7 Independence

At independence, Sub-Saharan African nationalist leaders and intellectuals, because of colonization of the African political consciousness, adopted the concept of the nation-state based on the European model. No alternative was

thinkable. The Western-educated elite played a major role in anti-colonial nationalist movements, having been educated and assimilated into colonial civil society producing a stratum of African society conversant in the language and political discourse of the colonial state and the Western philosophy of the political community. Anti-colonial movements and African intellectuals can be considered the means by which European political-cultural hegemony was maintained long after decolonization through alienation by these intellectuals of Sub-Saharan Africa's own rich history of pre-colonial political culture.

Thus, the basis of the post colonial state in Sub-Saharan Africa was the colonial state, independence constituting anything but a total break with colonial political values. Left behind at the end of colonialism was an unwieldy administrative structure relying on backward economies that could not support this bureaucratic weight, as well as a trade structure that benefited industrial countries, but blocked Sub-Saharan African growth.

Prior to 1945, less than 1% of Sub-Saharan Africa's population had full political and civil rights. Education was available to less than 5% of the population. In the late 1950s, just as independence began, Sub-Saharan Africa with a population of 200 million had only 8,000 secondary school graduates. Sub-Saharan African countries were expected to make a smooth transition from colonialism to independence, running sophisticated Western governments and economies with a "thin shell of educated" people. In many cases, the peasants had been trained to obey rather than think and understand the purpose of their work, resulting in a major constraint to continued development in the post-independent period. Even as late as the 1990s, many Sub-Saharan Africa universities emphasized memorization and feedback over conceptualization – remnants of the colonial past.

Sub-Saharan Africa's modernization has so far alienated Africa from itself in implementing the "imperial model" or "foreign model" which asserts that nothing in Africa's (past) experience is valid for the future. Statism became central to the new model of collective identify. Liberation produced its own denial and led to continued alienation of the masses, reflected in neo-colonial conservation policies today which continue to separate the masses in rural Sub-Saharan Africa from their natural resources and associated wealth based on a Western model, the only difference being that the state has replaced the colonial power: 1) Predatory elite rule and 2) Statism lays at the heart of Africa's ongoing crisis. The state as the only resolution of community remains central to African political thought, effectively de-legitimizing the non-state versions of community, thus trapping Sub-Saharan Africa in the political culture of the empire.

New nations were artificial creations bearing little relation to traditional political entities, the idea of a nation state being a foreign concept to Sub-Saharan Africa, an unnatural union. Ethnic groups, often traditional enemies, were suddenly expected to feel and behave as a nation. The new states suffered a serious defect, lacking loyalty of a unified people. Loyalty abided with the ethnic group. National consciousness of the European state was replaced by ethnic bigotry, clientelism, nepotism and institutional corruption.

Independent Sub-Saharan Africa inherited autocratic rule and structures from colonial administrations, assuming power in the absence of firmly rooted democratic institutions and processes. Multi-party one man, one vote elections tended towards one-party systems preferred by the ruling elite. One-party systems were closer to African tradition and brought more stability than multi-parties that resulted in ethnic divisions. Autocratic rule by one man or a small *clique* was a travesty of traditional Sub-Saharan African political decision-making, but was erroneously accepted by the West as being part of the African tradition.

Once the opposition is eliminated (e.g., chased out, killed or muted as under Sekou Touré of Guinea-Conakry, Hastings Banda of Malawi, Moi of Kenya and Mugabe of Zimbabwe), human rights are abandoned, while freedom of speech and the press become controlled by the autocratic ruler.

In the stagnating or shrinking economies of Sub-Saharan Africa, the communalization of politics resulted in each ethnic group struggling to place its *protégés* in power in order to guarantee themselves a portion of the national cake. Once patronage becomes a major instrument of politics, it permeates and subverts public life where merit plays no role, but ethnic and clan affiliations do. “Chiefs”, who in the past were the guardians of the people – including their self-respect and traditions - have become the “Big Men”, the “President’s for Life” who exploit their people. The fundamental prerequisite for development of a modern “Western” state often appears culturally incompatible with Africa. This is because neo-patrimonial clientelism exists in which wealth redistributed to the “Big Man’s” communal support base (his extended family, village, ethnic group, religious group, region, etc.) helps nourish the clientele who keep the “Big Man” in power. Often to maintain their power base, “Big Men” co-opt the armed forces into the elite.

Corruption associated with this patronage system, strongly linked to the extended family and tribe, and permeating all levels of society, may be the biggest cultural constraint to Sub-Saharan Africa adopting Western approaches to governance, business and even conservation. This poses a profound cultural crisis for Sub-Saharan Africa, resulting in Africans in their daily lives having to contend with two fundamentally different cultures; one rooted in traditional African communalism, forcing successful family members to share and distribute their wealth among kin to the point that many do not have a bank account or savings.

The second is rooted in Western individualism and the accumulation of materialism that evolved into modern capitalism.

14.1.8 “African Democracy” or “Donor Democracy”

Corrupt elites were easily turned into willing tools of harmful outside interests. The political elite, in order to maintain their lifestyles after independence, continued to serve the interests of the overseas powers (e.g., supplying raw products for the Mother country). They thus used the state to control the means of production without ownership. This allowed them to exploit others without appearing to be capitalists; a “Shadow State” of unofficial and illicit ties that bind the interests of state officials, rulers and rival strong men with foreign commerce and investors - “economic hijackers” delivering their countries into a new form of colonial bondage, where the mass of people live in poverty. In many cases, “democracy in Sub-Saharan Africa” has been a façade for the establishment of Western controlled puppet governments as former allies of the Cold War, especially France and the United States, battle each other for control of the continent’s vast natural resources. As a result, the West has developed economically, while the developing world, and especially Sub-Saharan Africa, continues to spiral out of control down a slippery slope to anarchy and poverty.

In the case of conservation and wildlife at independence, African governments retained most colonial wildlife laws and institutional set-ups, continuing the usurpation that had begun under colonialism. This ensured the continued exploitation by the hunting industry for the benefit and interests of the international trophy market, with the government being the conduit pipe. The inheritance of colonial laws and policies meant the inheritance of hostility between the government and local community members. Rural communities continued to be denied access to resources in colonially created national parks and

game reserves/hunting blocks from which they had been forced to re-locate, sometimes by compulsion, leaving their ancestral lands and abandoning their age-old hunter-gatherer practices. In adopting the colonial hunting laws and policies, newly independent governments retained policies based on alienating and marginalizing local community members from the hunting industry. Communities living in the vicinity of safari hunting areas continued resentment of efforts to develop the hunting industry. After independence, most local people's interests were still not considered paramount by African game and park departments. They saw no benefits from safari hunting or ecotourism as a conduit for generating revenue to improve their (local peoples') living standards.

By the 1990s, Heads of State in Sub-Saharan Africa had a 60% chance of losing power through assassination, exile or imprisonment, as various elites fought for control of the subcontinent's vast resource wealth. By the early 1990s, more than half the Sub-Saharan African states underwent transitions from military or one-party regimes to civilian rule. Much of this was a formality that allowed political parties with little change under the surface. By the mid-1990s, military coups *d'etats* in Rwanda, Burundi, the Central African Republic, Congo Brazzaville, the Gambia, Niger, Sierra Leone and more recently, the Democratic Republic of Congo, reversed these trends. Where multi-partyism exists, there tends to be a dominant party and thus little balance of power or accountability. In 1999 in Sub-Saharan Africa, one in five (20%) people lived in a country racked by civil or cross-border wars. By 2000, military leaders had replaced civilian governments in more than half the African states, often under the guise of democracy. Leaders have become adept at accommodating the international norm for competitive elections, while learning to manipulate them to their own ends. By 2004 every Sub-Saharan African nation has held elections, except for the Democratic Republic of Congo (DRC/former Zaire), though the degree of fairness of polls across the continent has varied widely. Changing constitutions to run for third

presidential terms appears to be a trend as seen in the Central African Republic, Nigeria (blocked by Senate) and Uganda in 2006.

Parliamentary democracy can work when individuals identify as citizens as opposed to communal support networks such as ethnic and/or religious groups necessary for survival under precarious economic and environmental conditions. Meanwhile, the majority of national budgets of most Sub-Saharan African countries are donor funded. This “Donor Democracy” has two main features:

- Empowerment of the state through creation of an oligarchy (elite); and
- Disempowerment of the citizens.

Since the state does not need to collect taxes from its citizens, living off donor handouts and natural resources, citizens have no real way of holding their government accountable, while the oligarchy’s allegiance and accountability is to fulfill the desires of its donors and expatriate private sector partners as opposed to doing what is best for its citizens. As long as the oligarchy bows to the West (e.g., adopts structural adjustment programs that allow extraction of cheap raw products from the continent), welfare keeps coming in, a portion of which is skimmed by the bureaucratic elite to help them maintain their lifestyles – corruption being ignored by the donors, while the majority of the people suffer in silence. The vast majority of the continent’s riches are expropriated by the West in collusion with the oligarchy. Little or nothing from Sub-Saharan Africa’s riches is reinvested in the people (health and education) or infrastructure (industry, road networks). The German-based Transparency International rates Sub-Saharan African countries among the most corrupt in the world. Meanwhile, for every dollar of AID to Sub-Saharan Africa, Western economic interests take out a minimum of two dollars.

Where democracy exists, it tends to be an illusion. Human rights violations, official corruption and a lack of government accountability are commonplace. “Aid-speak” is full of many plastic words such as “good governance”, “human rights”, “anti-poverty”, “deregulation”, “de-bureaucratization”, “decentralization”, “multi-party democracy”, “civil society” and “anti-corruption”. In many cases, these processes are absent and democracy becomes a façade.

Preliminary attempts by Africans at rectifying these problems, such as in Zaire (the Democratic Republic of Congo) in the early 1960s, did not fit the Cold War agenda of the West. Uganda, under President Yoweri Museveni, appears to be one of the first African countries trying to find an “African Solution” to democracy that fits within their socio-cultural make-up. However, after more than 20 years in power, concern exists that President Museveni is beginning to show signs of the classic “Big Man”, censuring opposition and using repression, while staying in power and arranging with parliament to change the constitution, allowing him to run for more than two terms. Ultimately, democracy must come from within and will likely never work if imposed from the outside based on pre-packaged one-model-fits-all solutions (e.g., one-man one-vote multi-party elections). The same can be said for Community-Based Natural Resource Management (CBNRM) and conservation in Sub-Saharan Africa.

14.1.9 Beginning of 21st Century, Overpopulation, Desertification and Declining Per Capita Land to Feed Sub-Saharan Africa

Sub-Saharan Africa is said to be suffering from over-population and desertification. This is not a new phenomenon, having been associated in the past with the spread of the Bantu culture throughout East and Southern Africa. Africa has dealt with this in the past and will have to deal with it in the 21st century. Today's movement, rather from north to south, is from rural to urban, very often from the interior towards the coasts, from low economic zones to the subcontinent's limited areas of economic growth (e.g., South Africa). As currently being practiced, welfare relations and food handouts from the West are not believed to be a sustainable solution to economic growth and development in the wealthiest resource gifted subcontinent in the world.

Agricultural land per capita has decreased from 0.5 to 0.3 ha over the last 30 years, while 60-70% of the labor force ekes out an existence as itinerant farmers and/or nomadic pastoralists whose ways of life are disappearing. Low-input agriculture, particularly in the absence of appropriate conservation practices (e.g., fallowing), leads to degradation of the land, further constrained by the geometric increase in domestic animal populations. This man-made desertification creates tension zones, especially across the Sahel, as land and resources are degraded and their availability becomes limited, examples being:

- 1989 Senegal and Mauritania nearly went to war as pastoralists and farmers collided – 70,000 farmers fled Mauritania, linked to dams and proposed irrigation of traditional floodplains;
- Darfur, Sudan and Nigerian pastoralists and itinerant farmers collide;
- The Ivory Coast – land disputes between indigenous Ivorians - Burkinabé and recent immigrants from Sahel, leading to civil war;
- Rwanda – complex geo-political war, but land and resource scarcity helped spark the fire as the population increased from 2.1 to 7.7 million between 1950 and 2000, resulting in 843 inhabitants/km² of arable land;

- In October 1993, about 30,000 Kikuyu farmers were chased out of a traditional pastoral area by Maasai herders, Enosupukia (between Nairobi and Narok); and
- Kenya, August 2004 land invasions of mostly white-owned ranches linked to population increase from 6.3 – 30.7 million people between 1950 and 2000.
- Kenya, 650-1,000 deaths between the new year and late-January 2008, and 250,000 internally displaced people, proximately over disputed presidential elections, but ultimately conflict over land and resource scarcity, linked to ethnic clashes over power and thus privileged access to land, jobs and other resources.

As this form of agriculture that has not changed for the past 2000 years results in soil exhaustion and crop failure, often the only thing left is to send children to work for someone else. Studies have shown that cultures dependent on subsistence farming have the highest rates of child labor. In most cases, these victims of this “poverty trap” are denied a formal education – condemned to an endless cycle of poverty passed on from one generation to the next.

14.1.10 “Islands of Wildlife” Surrounded by a Sea of Poverty

“Islands of Wildlife” are disappearing under a wave of poverty as their habitat is engulfed and degraded by small farmers, pastoralists and, in East Africa, increasingly commercial farms on high altitude grasslands. There is a direct relationship between the increase of human populations and decrease in large herbivores and their habitat on the subcontinent. In countries such as Kenya and Tanzania, wildlife populations are estimated to be 25% of what they were 40-50 years ago, as habitat has gone beneath the plow. In other countries, such as Uganda and much of West Africa, the percentages of surviving wildlife may be even lower. Today, in Southern Africa as a whole, wildlife makes up only 10% of the large herbivore biomass, the remainder consisting of livestock. In Kenya, and this is believed to be the major problem with wildlife throughout the subcontinent, there appears to be a direct relationship between the increase in human

populations (+>3%/year) and the decrease in wildlife (large herbivores) (->3%/year), apparently from habitat loss.

Cotton fields and livestock are invading the hunting blocks and national parks of the Benoué, Faro, Bouba-Njida in Cameroon. Maasai cattle graze in Amboseli and Maasai Mara National Parks, Kenya, while their rainy season dispersal areas – where wildlife spend up to six months of the year, during which time young are dropped and weaned – are being converted to commercial wheat and small maize farms. Along with conversion of land to small farms, by 2001 there were 10x more cattle than the next most abundant wildlife, zebra, in the Tarangire National Park rainy season dispersal area. Lake Nakuru National Park, Kenya, is so hard edged – surrounded by small farmers – that the fences are bent inward from locals slipping across illegally to access resources which they need to survive, such as firewood. These are only examples, but the reader can be assured that this is occurring across the subcontinent, along with poaching for short-term gains, even in highly developed South Africa. Modern conservation and development, as they currently stand, have forced Africans to take a short-term view of wildlife that they sustainably managed and cohabited with for hundreds of years.

Only on private and some communal lands in Southern Africa, where it has become a major economic resource, have wildlife populations exploded since the turn of the century after having been decimated by European settlers.

The body that attempts to save endangered species through regulated trade, the Convention on International Trade in Endangered Species (CITES), ignores many of the real current causes of elephant/wildlife depletion, which cannot be addressed through trade control, but must be dealt with on-the-ground and are integrally linked: 1) Poverty, 2) Failed Centralized Management Systems, 3) Inappropriate Governance, 4) Corruption at all levels of society, 5) Lack of

perceived control by rural communities over access to “their” wildlife and other resources, 6) Alienation by rural communities towards parks and protected areas, which they perceive as having been confiscated from their ancestors and which cut them off from natural resources needed for survival and economic development, 7) Lack of adequate benefits (economic and cultural) to rural communities from elephant and other wildlife, 8) Human and livestock populations that have increased up to 6.5 times during the 20th century, displacing wildlife and leading to, 9) Land hunger and resulting habitat loss, 10) Failure to urbanize and industrialize at a rate that can take significant pressure off rural areas and their natural resources by offering alternative lifestyles and 11) The illegal bushmeat trade, which could be sustainably managed if legalized, to fill the demand of rapidly growing urban populations in Sub-Saharan Africa.

Most rural Africans who bear the consequences of living with wildlife have never heard of CITES, it being irrelevant to their daily lives. In fact, CITES helps create black markets, providing minimal returns to rural Africans and, if anything, encourages mining wildlife to increase revenue for short-term gains and/or conversion of critical habitat to man-made agricultural systems, since wildlife as a land use has little long-term value. CITES has become a three-ringed circus at the expense of rural Africans and their wildlife, that serves as an ideological battle ground (e.g., animal rights versus sustainable use, non-hunters versus hunters – mostly urbanites whose lives do not depend on living directly from nature, buying their food in a supermarket) where Western dogma and ideologies are debated as various factions through nation states vie for political control of “global conservation direction”.

CITES members in the West and their animal rights allies are also known to sponsor range and non-range states to meetings in return for their votes against utilization of species (e.g., Kenyan proposed upgrading of lions to Appendix I in

2004). Range states have been threatened with foreign aid cuts if they vote against what the West wants and animal rights groups have been known to provide prostitutes to African delegates for their vote. It is an ideological war that the urbanized West is prepared to win at all costs. While the political elite get wined, dined and bedded around the world, Sub-Saharan Africa's rural people and natural resource base lose.

14.1.11 Loss of Forest Cover in Sub-Saharan Africa

Forest cover is disappearing at an estimated 3-5 million ha/year, mostly in forested savannas that are succumbing to the movement of small itinerant farmers onto marginal unsustainable agricultural lands, often critical dry season grazing areas for livestock and wildlife. It is estimated that the Sahelian and Sudano-Sahelian zones, along with the southern tip of the African continent, have less than 25% of their original forests remaining, much of this loss being from forested savannas. Associated with itinerant agriculture, secondary forests are vanishing as fallow lands and periods disappear and/or decline. Dry forests of the Sahel (a form of savanna) are being mined for firewood and charcoal, the major source of energy for most rural and urban Africans, respectively contributing to global warming and to an important loss of biodiversity. Natural forest management programs in West Africa, linked to the concept of *gestion des terroirs*, are attempting to return ownership and exclusive right of benefits to rural communities through rotational management of dry forests in the Sahel. It is still too early to determine how far true devolution of community resource management will develop over state-controlled decentralization that brings the bureaucracy down to the level of local government or central government representatives.

Meanwhile, many question any attempt at giving the current “green label” to European companies for sustainable logging practices in Sub-Saharan Africa’s dense humid tropical lowland forests. A major limitation to certifying sustainable forest practices in the tropics is that “sustainable tropical forest management” has yet to be defined, some considering these certification schemes to be a “greenwash” because the standards are so weak and vague that any relation between compliance and true sustainability would be impossible to verify. The German-based Forest Stewardship Council (FSC), as of 2005, had not certified any forest management operations, forest owners, manufacturers or timber traders operating in the Congo Basin:

- In many cases, forests are being selectively high graded, first cutting the most valuable timber, followed by making a second pass for timber of lower value. Since many of the most valuable species have rotational cycles of hundreds of years, questions are being asked as to how sustainable such practices may be based on 30-40 year rotational schemes;
- Meanwhile, forests are being fragmented by logging roads and the lifestyles of hunter-gatherer groups, such as Pygmies, are being destroyed; and
- Logging roads are opening up the forests to an unregulated unsustainable bushmeat trade to feed a growing urban demand that, if legalized, managed, and placed under a modern monitoring and management regime could offer an important source of income to local people, but as being practiced, is devastating wildlife populations. The killing and butchering of primates for bushmeat is now believed to be linked to HIV/AIDS jumping from monkey to man, and could see other simian retroviruses jump-over and become virulent in humans.

Sustainable forestry remains little more than a pipe dream, with logging practices being governed more by market forces than by long-term sustainability. Biodiversity losses continue to accelerate in Sub-Saharan Africa’s tropical lowland forests.

Currently, safari hunting blocks in the dense humid lowland forests of the Congo Basin (e.g., Cameroon, CAR and in the past Congo Brazzaville) using repression against the local people, provide safe havens for wildlife. Like all CBNRM programs, minimal benefits go to local people, often cutting them off from key sources of proteins and destroying local cultures, putting into question the sustainability of such neo-colonial conservation models, both hunting blocks and parks that serve to exclude local people.

14.1.12 Rural-Urban Migrations, HIV/AIDS and Poverty in Sub-Saharan Africa

Due to the shortages of land and other resources, massive rural to urban migrations are creating mega-cities and some of the worst crime ridden conditions in the world. Poverty stalks Africans behind every street corner and bush. Based on purchasing power parity, more than 50% of Sub-Saharan Africa's 622 million people still live on less than US\$ 1/day, the UN Food and Agricultural Organization (FAO)'s definition of "absolute/extreme poverty". Only in Sub-Saharan Africa, where incomes are expected to grow very slowly, are the numbers living in poverty expected to rise from 240 million in 1990 to 345 million in 2015. By then, two out of five (40%) people in the region will be living in poverty.

The proportion of Sub-Saharan Africa's population living in cities has doubled from 15% in the 1960s to over 30% today and had the highest urbanization rate in the world of 4.3%/year in 1995. It is estimated that the urban population in Sub-Saharan Africa will overtake the rural population by 2020, requiring that agricultural production and security strategies look beyond subsistence production in rural areas to supplying cheap, safe food to the cities.

It is projected that the number of cities in the region with more than 100,000 inhabitants will grow from 90 in 1990 to more than 300 in 2020. Increased urban densities will be the most pronounced and by a wide margin in Nigeria, which will have more than half of these cities. Lagos alone will have roughly 12-15 million inhabitants. Some models predict that by 2020 there will be one continuous coastal city between Lagos and Abidjan. Will these mega-cities contain an urban middleclass or slums?

In 2005, the average life expectancy in Sub-Saharan Africa is 46 years old compared to 77.6 years in the USA. More than 28 million Africans are living with HIV/AIDS, creating 12 million "AIDS Orphans" as this is being written, with the numbers increasing daily. About 70% of the HIV/AIDS infections globally come from Sub-Saharan Africa, with a large proportion being women who account for 80% of the agricultural labor force and therefore, food production.

Currently, more than 250 million of Sub-Saharan Africans lack access to safe water. More than 200 million have no access to health services. Malaria kills more than one million people/year in Sub-Saharan Africa, the majority being children. More than two million children a year die before their first birthday. More than 140 million youth are illiterate and less than one-quarter of poor, rural females attend primary school. Fewer than six of ten primary-school age children (less than 60%) were enrolled in 2000, the lowest rate of any region and far below the 84% world average - the only region in the world where the numbers of children out of school are rising. Half of the Sub-Saharan African countries show gross enrolment rates of no more than 26% for secondary education and 2.5% for higher education of school aged youth and spend less than 3.4% of their national income on education.

14.1.13 Famine, Poverty and Civil War in Sub-Saharan Africa

The global population increase of 90 million people/year demands an extra 30-40 million tons/year of grain. The first global grain deficits of 2000 increased to a shortfall of 96 million tons by 2003, forcing a drawdown of the global stockpile. Record harvests in the United States in 2004 raised the hope of breaking even. If the global grain deficit of the last three to four years continues, some say linked to global warming, the goal of food self-sufficiency for Sub-Saharan Africa becomes even more critical, as the time may come when the world may not be able to feed Africa, especially when the subcontinent's population reaches a projected 1.8 billion by 2050. In addition, the increasing use of food crops (e.g., maize/corn and soy beans) to produce biofuels as alternatives to the ever-increasing cost of fossil fuels, especially oil, could decrease the surplus of such crops from the First World available to feed the developing world, including Sub-Saharan Africa.

Acute food insecurity in 2003 affected 38 million people in Africa who faced the outright risk of famine, with 24,000 dying from hunger daily. It is estimated that the number of chronically undernourished people in Sub-Saharan Africa increased from 168 to 194 million between 1990 and 1999. It is estimated that by 2009, 60% of the Sub-Saharan African population will consume less than the minimum nutritional requirements (e.g., 1,950-2,210 calories/person/day for light activity). It appears that the targets of halving poverty and under-nutrition by 2015 will not be met on the subcontinent. There is likely to be little or no decline in the numbers of undernourished people, although the proportion will approximately halve. In Sub-Saharan Africa, an estimated 15% of the population or 183 million people will still be undernourished by 2030, by far the highest total for any region of the world and only 11 million less than the 1999 figure.

Annual per capita grain production in Sub-Saharan Africa, which averaged 147 kilograms between 1961 and 1980, fell to 120 kilograms between 2000 and 2002, a drop of 18%. Imports of cereals by Sub-Saharan countries are estimated to increase from some 17 million tons in 2000 to 27 million tons by 2020. It is projected that Sub-Saharan Africa will have a food shortage of a minimum of 32 million tons by 2020.

About 90% of the human brain growth and much of the body's growth takes place in the first five years of life, making nutrition not only a humanitarian imperative, but a basic requirement for sustained economic growth. As things currently stand, Sub-Saharan Africa has lost the race before it gets to the starting blocks in being able to compete in a global market place, with a majority of its population being adversely impacted by poor nutrition.

Hunger is particularly damaging to health, with an estimated 50% of all childhood deaths related to poor nutrition (protein-energy and vitamin A deficiency), and iron-deficiency anemia dramatically increasing pregnancy-related mortality. In 2000, 529,000 women died of birth related causes, mostly in developing countries and more than half (270,000) in Sub-Saharan Africa, while fewer than 2,500 died in developed countries.

While the single most important cause of hunger is poverty, Sub-Saharan African famines have evolved from being triggered mainly by drought to being triggered mainly by civil war often linked to "resource wars". There are two types of such wars being experienced on the subcontinent that lead to famine by disrupting traditional production systems:

- **Over Scarce Resources – Mainly Land and Pasture**

- Sahel from Senegal to Sudan;
- East Africa (Rwanda Burundi, Kenya);
- The Ivory Coast; and
- Zimbabwe.

- **Over Rich Resources**

- The Democratic Republic of Congo– COLTAN, cobalt, diamonds, oil, etc.;
- Angola – Oil and diamonds;
- Congo Brazzaville – Oil;
- Liberia - Timber and diamonds;
- Sierra Leone – Diamonds;
- Southern Sudan – Oil and other minerals;
- Equatorial Guinea – Oil; and
- Niger Delta, Nigeria – Oil.

World-wide in November 2000, there were 23.5 million people in need of humanitarian assistance due to conflict, of which 18.5 million (79%) were in Sub-Saharan Africa and of which women and children constituted 70–80% of the refugees and Internally Displaced Persons (IDPs) uprooted by this violence. In early 2008, it is estimated that 45,000 people die every month from direct or indirect causes of the war raging on in the eastern DRC, making this the most deadly conflict since World War II, exceeding the combined deaths from conflicts in Bosnia Herzegovina, Rwanda, Kosovo and Darfur in Sudan. CNN is not there so for most of the World the crisis does not exist. Of 15 UN peacekeeping missions around the world, five are based in Sub-Saharan Africa. Such disruption

and famine also have an adverse impact on wildlife and natural systems, disrupting government and traditional management systems and forcing the starving masses to mine wildlife and fuelwood among others, for short-term survival, while auctioning off their long-term future as a result of resource degradation.

14.1.14 Misuse of Foreign Aid, Subsidies, Structural Adjustment Policies, Debt and Other Foreign Policy Tools - Adversely Impacting Sub-Saharan Africa

Government-to-government handouts, “foreign aid” from the West, will not work, rewarding failure and creating a dependency culture. Over 40 years of foreign aid, along with more recent structural adjustment programs and debt relief, has had little positive impact in helping Sub-Saharan Africa achieve economic independence or food security.

Geo-politically, during the Cold War of the 1960s, 70s, 80s and 90s, by keeping countries indebted, while pouring in large amounts of “foreign aid” and ignoring corruption and its misuse, the West was able to keep a few African elite well off, while countries remained poor, dependent and exploitable by the West, both from the standpoint of natural resources and for ideological purposes. For many African elite, development failures meant more foreign aid that they could redirect for their own purposes. Corrupt and tyrannical governments often diverted aid money to military projects used to finance policing, repress opposition and/or maintain neo-patrimonial relationships that made sure the ruling elite stayed in power, or to Swiss bank accounts as “retirement” plans for African dictators in case these tactics failed.

On average, one year of foreign aid to Sub-Saharan Africa is more or less equivalent to the US\$ 12 billion Marshall Plan that rebuilt Europe after World War II, but with little to show for all of this spending. The problem is not the quantity, but how foreign aid is used. Between 1960 and 1986, the Western donors spent about US\$ 116 billion in Sub-Saharan Africa foreign aid (Official Development Assistance/ODA). In 1998, some estimates are that US\$ 13-16 billion was received in foreign aid/ODA, but only US\$ 3 billion went directly into general government budgets, while US\$ 9 billion was required to service debts. About 70-90% of foreign aid recycles to the donor country. Foreign aid has been good business for "Beltway Bandits" - Western consulting firms, construction companies, NGOs and Sub-Saharan African governments - but has had an adverse impact on Africans and their natural resources.

What most laymen do not understand is that bi-lateral foreign aid only needs a 25% grant component to be considered Official Development Assistance (ODA), the remainder being loans. Foreign aid results in massive debt. Other forms of foreign assistance are mostly loans that in theory must be paid back and also contribute to this debt. From 1991-2001, ODA comprised 88.3% of total investment in Sub-Saharan Africa, followed by 11.5% private investment and 0.2% Other Official Flows (OOF)/official assistance. Government-to-government foreign aid cannot drive economies. Until private investment/Foreign Direct Investment (FDI) comprises the majority of investment on the subcontinent, Sub-Saharan Africans will remain poor and per capita GDPs will continue to be negative.

Foreign aid, as currently practiced, creates more dependency on the West and has been counterproductive to Sub-Saharan Africa's emerging democracies, agriculture and economies in general. Over the past 20 years, the International Finance Institutions (IFIs) have provided most Sub-Saharan African countries

with loans to pay off their debt that in turn adds to their debt, an endless cycle, which they can not escape. The fact is that 99% of the Sub-Saharan African countries cannot pay back their debts. As an example, from 1989 to 2002, 38 of the world's poorest countries, mostly in Africa, received US\$ 40 billion in debt relief and still piled up US\$ 93 million in new foreign assistance loans. By the end of 2004, they owed US\$ 144 billion to multilateral institutions such as the World Bank and IMF, other countries and private banks. This is the reason the U.S. Congressional Meltzer Commission recommended that foreign assistance, including that of the World Bank, be in the form of grants only. Plans to forgive debt in 2006 only make sense if new "loaned-based foreign aid" is stopped, otherwise the debt cycle will start all over again as in the past.

14.1.14.1 Subsidies and protected markets

Dumping subsidized food under the guise of foreign aid undercuts local production. It is ironic that developed countries and institutions such as the World Bank and IMF oppose food subsidies for poor farmers in Sub-Saharan Africa to improve food production. In 2001, developed countries paid their farmers subsidies amounting to US\$ 311 billion, as much as Sub-Saharan Africa's entire economic output. Of every US\$ 1 in U.S. farm revenue, about 25 cents comes from the government, averaging \$20,800 per farmer in the year 2000. As the result of the European Union (EU) Common Agricultural Policy (CAP), while the average person in Sub-Saharan Africa earns less than US\$ 1/day, a European cow earns US\$ 2/day as a result of subsidies, reducing Africa's potential export of agricultural products by 50%, with a potential growth from the current US\$ 10.9 billion/year to nearly US\$ 22 billion/year (excluding South Africa) if these subsidies and controls were lifted. This could increase annual per capita incomes by 13% in Sub-Saharan Africa. This is not believed to include transformed products. EU tariffs protect the processing industry from products that could be

transformed in Africa such as coffee, cocoa, oilseeds, vegetables, fruit, nuts, hides and skins. Meanwhile, developing countries have been forced to “discipline” their subsidy norms as per the World Trade Organization (WTO)’s Agreement on Agriculture, allowing for a maximum limit of 10% of subsidy support under the Aggregate Measure of Support (AMS) clause.

As the result of protected markets, the average import duties on farm products to the EU and U.S. are 40-50%.

Subsidies and protected markets help the U.S. and the EU to account for 35% of the global trade in food and agriculture. The Cairns Group, comprising 17 food-exporting countries, accounts for almost 23% of the world’s agricultural exports.

The September 2003 WTO discussions in Cancun, Mexico, collapsed over differences between the West and the developing world concerning agricultural subsidies and protected uncompetitive markets, especially by America and Europe. By 2000, the USA had lifted only 13 of 750 restrictions to “free-trade” acknowledged in the Uruguay round of the General Agreement on Tariffs and Trade (GATT); the EU 14 of 219 and Canada 29 of 295. In practice, two sets of rules have been enforced: one for those allowed to and responsible for distorting the market through tariff and non-tariff barriers and one for those – the developing countries – who were not and are now legally prohibited from doing so. While there is talk of eliminating many export subsidies, it appears the earliest they will be lifted is between 2015 and 2017. Meanwhile, there are many creative ways to hide domestic trade and production subsidies under the following categories:

- **Green Box** (no, or minimally trade distorting support) including subsidies granted in the name of environment protection and preservation, and for

agricultural research and development. The “Green Box” houses up to 70% of the U.S. subsidies and remains untouched;

- **Blue Box** (domestic support linked to limits on production and exempted from spending limit); and
- **Amber Box** (all government spending in this box, unless it qualifies for Blue or Green Box) - trade distorting support. This includes market price support, direct payments and input subsidies.

Many developed countries also take advantage of protecting sensitive products under a special category of Special Safeguard Measures (SSG). Crucial commodities can be declared as sensitive and thereby be denied market access, a form of quota setting. For instance, the United States, the EU, Japan and Canada maintain tariff peaks of 350 to 900% on food products such as sugar, rice, dairy products, meat, fruits, vegetables and fish.

For instance, Africa loses US\$ 300 million a year as a direct result of U.S. cotton subsidies. In 2004, in a landmark decision, the World Trade Organization (WTO) ruled in favor of Brazil’s complaint that U.S. cotton subsidies distort world prices, violate global trade rules and price developing nations’ goods out of markets.

A combination of subsidies, protected markets and trade manipulation push down world prices for raw products (e.g., cotton, peanuts, coffee, cocoa, sugar, etc.). Desperate farmers in already over-populated Sub-Saharan Africa, in order to increase and/or maintain income levels, expand production onto marginal land, resulting in habitat degradation, increased seed densities mining soil nutrients and/or over-use of fertilizers and pesticides in attempting to increase production, impacting soil and surface water quality. In addition, there is a tendency to use the best soils and any inputs (e.g., fertilizer and pesticides) for cash crops, while

expansion occurs into marginal areas with low inputs to produce food crops, also resulting in soil mining and habitat degradation.

By 2006, trade talks suggests that while current proposals would allow both the European Union (EU) and United States to increase trade-distorting spending on agriculture, current proposals on Non-Agricultural Market Access (NAMA) would not allow poor countries to increase tariffs to protect their domestic sector from increased imports. This may carry over to disallowing tariffs to control the dumping of subsidized agricultural products from rich countries that negatively impacts jobs and livelihoods. Changing trade relations between the developed and developing world will likely be a long row to hoe.

14.1.14.2 Structural adjustment, IMF and the World Bank

G-7 countries⁵⁷⁷ have 12% of the world's population, but they use over 70% of its resources in cash terms, consuming 45 to 85 metric tons of natural resources/person/year. It currently requires 300 kilograms of natural resources to generate US\$ 100 of income in the world's most advanced economies. They appear to be willing to do whatever it takes to keep these raw resources rolling in as cheaply as possible to stimulate their economies and support their material-based lifestyles.

Although direct control through political colonialism largely ended by about 1960 in much of Sub-Saharan Africa, the West began using economic relations to indirectly control African politics, economies and access to Africa's resources. Neo-imperialistic tools and policies, such as foreign aid and structural adjustment, were used to continue meeting Western capitalistic demands, as opposed to exporting capitalism to the developing world.

⁵⁷⁷ Now referred to as G-8: G-7 plus Russia.

International financial policies continue to encourage Sub-Saharan Africa to be a major exporter of raw products, whose prices are kept low by Western controlled markets. Major exports from Sub-Saharan Africa have remained essentially the same since the 1960s, with most of the subcontinent being heavily dependent on one or two primary products; agriculture, minerals or timber accounting for 90% of Africa's foreign exchange with little or no added value from transformation. Since the 1970s, Sub-Saharan Africa's market share for these commodities has declined. Market share losses were 40% for commodities such as copper, timber and coffee, almost 60% for iron ore and 30% for cotton and cocoa. The reliance of many Sub-Saharan African countries on imports of manufactured goods left them importing more while exporting less – a continuation of the colonial formula. Their Balance of Payments (BOP) problems worsened and foreign debt burdens became unsustainable.

Many in the world today see America as “controlling the global economy”, either through its multinationals or its “puppets”, the World Bank and International Monetary Fund (IMF). The World Bank and IMF became increasingly powerful in Sub-Saharan Africa with the economic crisis of the early 1980s, which they helped orchestrate. In the late 1970s, rising oil prices, rising interest rates, a declining share in world trade and falling prices for primary commodities left many poor Sub-Saharan African countries unable to repay mounting foreign debts, the ratio of its foreign debt to its export income growing to 500% in Sub-Saharan Africa.

Structural Adjustment, IMF and the World Bank

Countries were convinced to take low interest rate IMF/World Bank loans, which were rolled over as interest rates compounded, making paying off the interest rate,

let alone the loan, next to impossible. Very often, the IMF/World Bank loans were used to service interest rates on debt. These loans, in turn, added to the national debt. Economies were driven by donors instead of the private sector, as the region was turned into one big welfare state providing cheap raw commodities to the West. Between 1985 and 1990, Sub-Saharan Africa paid out more in interest to the IMF and World Bank combined than it received from them in foreign grants and loans. Gradually, these loans evolved into a core set of economic policy changes required by the World Bank and IMF, including:

- Cutbacks in government expenditures, especially in social spending (health and education);
- Rollback or containment of wages;
- Privatization of state enterprises and deregulation of the economy;
- Elimination or reduction of protection for the domestic market and less restrictions on the operations of foreign investors;
- Successive devaluations of the local currency in the name of achieving export competitiveness;
- Increased interest rates; and
- Elimination of food and agricultural subsidies and cutbacks in agricultural extension and research.

These conditions became known as Structural Adjustment Policies (SAPs).

The underlying intention was to minimize the role of the state. Sub-Saharan African governments were required to downsize, a controversial move since with a very small private sector, most educated people in Africa were tied to government service and for every employee there were up to 20 members of the extended family dependent on his/her salary. With no private sector to absorb these people, this would mean millions of people potentially without a basic life

support network. SAP required user fees, which many people could not afford, for health care, education and basic social infrastructure, resulting in a decline in the quality of these services available to the average person. This undermined the substantial progress made in the 1960s and 70s in extending primary health care and education to redress the inequalities of the colonial era. The immediate consequence of these changes was to weaken the already precarious situation of a very large number of Africans, often resulting in social unrest. Urban dwellers in particular suffered high levels of unemployment and a serious fall in their standard of living. It is clear that neoliberal doctrines undermined education, health, increased inequality and reduced labor's share in income.

A major goal of SAP was to increase exports from Sub-Saharan African countries so as to increase their income of "hard currency" needed for servicing their debts. The IMF priority was to sort out Balance of Payments (BOP) deficits as fast as possible. Devaluation of currencies was to make exports more attractive on the global market. Currency devaluation in conjunction with trade liberalization to a large number of countries - all exporting the same crops - led to market flooding and a marked drop in commodity prices and income to most "beneficiaries", especially the small farmers of Sub-Saharan Africa. This is a reflection of northern industrialized countries under pressure from domestic corporate lobbies to keep commodity prices at consistently low prices, as well as the legacy of colonial economic relations between the North and South that continue today under the guise of structural adjustment programs and multilateral trade rules. The fact is that open borders and the export of primary products have not led to sustained development anywhere in the world.

SAP price reforms attempted to stop the underpayment of African farmers by state "control boards" for coffee, maize and other commodities, or stop artificially low prices paid to farmers in order to keep the urban masses happy. SAPs failed

to address and/or realize physical and chemical limitations of the soils, especially in the savannas where a majority of the people live and which are not conducive to permanent commercial agriculture, and that have low rainfall, declining land available/person to cultivate, an uneducated and poorly nourished populace, often very repressive climates and disease, as well as inadequate market infrastructure such as roads and storage facilities. Thus, declining terms of trade for primary products and physical/ecological constraints made great strides in agricultural production impossible. What no one is prepared to admit is that the percentage of prime soils is limited (27% of Sub-Saharan Africa). Sub-Saharan Africa's savanna environment, comprising 70-75% of the total habitat, will generally not sustainably support commercial agriculture, nor the currently out-of-balance population of people and their livestock. You can play with economies, but it is difficult to manipulate nature and come out on top.

Many small farmers were put out of business by a combination of falling commodity prices and Western food dumping, going back to a subsistence mode. Developing countries have sacrificed food self-sufficiency at the altar of world trade. Gross Domestic Product (GDP) saw some increase, between 1960 and 1980. However, per capita GDP that also increased by 36% in Sub-Saharan Africa in that time frame, fell by 15% in Sub-Saharan Africa between 1980 and 1998, during the SAP period, showing structural adjustment policies to be bogus. Sub-Saharan Africa is the only region where the annual growth of GDP per capita has been negative, at -1.0% between 1975 and 1999, compared with 6.0% for East Asia and the Pacific and 2.3% for South Asia. Some authors place the per capita GDP decline in Sub-Saharan Africa at 64%, from US\$ 671 in 1975 to US\$ 245 by 1997, most Africans being worse off than 25 years earlier. It also indicates that economies are not keeping up with human population growth.

By 1990, the continent's total debt burden stood at US\$ 272 billion, 2½ times what it had been ten years before SAPs, an equivalent to 90% of Africa's Gross Domestic Product (GDP). Sub-Saharan Africa's total income is not much more than Belgium's and is divided among 48 countries with a median GDP of just over US\$ 2 billion—about the output of a town of 60,000 in a wealthier country. Sub-Saharan Africa's share of world trade slumped from 3% in 1950 to 1.5% in 1999. While Sub-Saharan Africa is dependent on the global economy, it is being marginalized by the global economy. Some question the ability of the limited resource base and economies of Sub-Saharan African states to each support sustainably Western style bureaucracies left behind as a result of colonialism, a major reason for attempts to develop regional economic and trading blocks.

To assure that the IMF and World Bank had plenty of disciples singing the same tune on fundamental economic doctrine, the World Bank and the United Nations Development Program (UNDP) created the “African Capacity Building Initiative”, which by 2001 was training central bank and finance ministry staff, teaching at 33 African universities, along with research and joint projects. This coercion and social engineering, which has reduced public services and leadership indifference to citizen's wishes, has triggered violence across the African continent and many other places in the world.

A major shortcoming of structural adjustment is that it is based on government-to-government loans. Governments are not entrepreneurial by nature. The hypocrisy of it all was that adjustment reforms were to be implemented by the very state, which was intended to be “reduced”. The governments were rewarded with renewal of financial aid, but should have needed less aid if these reforms stimulated Foreign Direct Investment (FDI) and economic growth, which they did not. The elite practiced what some call “politics of the mirror”, going through the motions of fulfilling World Bank, IMF and donor condition precedents, but with

little actualization at the implementation stage. In turn, the elites redistributed much of the foreign aid to maintain their power through neo-patrimonial relationships. Structural adjustment/foreign aid were “Africanized”. The spin offs included new Mercedes Benz’s (In Swahili these elite are called “*Wa-Benzis*” – literally in the eyes of local people, they have turned into a tribe) which they otherwise could never afford, free trips overseas and skimming or redistributing loan/grant money that is often not very well accounted for.

Meanwhile, in Sub-Saharan Africa (SSA), people living below a poverty line, as defined at US\$ 1/day, increased from 217 million to 291 million from 1987 to 1998, averaging around 46% of the total population over this period. The net result of structural adjustment policies is that of the 32 countries globally classified as severely indebted low-income countries, 25 are in Sub-Saharan Africa. It is believed that the rise in the bushmeat trade that is devastating wildlife populations in the dense humid lowland forests of the Congo Basin has much to do with SAP policies lowering the prices paid for farmers for coffee and cocoa.

It would seem that the Third World is being forced to take a medicine often ignored by the First World. Ultimately, SAPs contributed to the proletarianisation of the middleclasses, bringing an army of bureaucrats, intellectuals and professionals into the ranks of workers, peasants and the unemployed. SAP policies discouraged government subsidies for important social services, such as education and health, needed to assure advancement of society, encouraging *laissez-faire* economics, resulting in extremes of lifestyles between the elite, virtually no middleclass and the extreme poor in Africa and other developing countries, a form of capitalism abandoned by the West a century ago.

Ultimately, post-independent governments in Sub-Saharan Africa were driven into a cul-de-sac by the neoliberal policies of SAP, both locally and globally. The U.S. Congressional Meltzer Commission has suggested that the IMF should provide advice on economic policy, but not impose conditions. In other words, SAP should be done away with, in addition to the Commission also recommending that the IMF be downsized and that it should only provide short-term liquidity assistance to governments. Ultimately, many of SSA's resource rich countries should require minimal foreign assistance if the West holds them accountable for reinvesting the wealth generated from these resources back into the development of the people (health and education) and the country (e.g., infrastructure), both of which should encourage Foreign Direct Investment (FDI).

One of the largest economies in the World, the USA, seems to function almost as well under a balanced budget (William (Bill) Jefferson Clinton Era) as under deficit spending (Reagan and Bush Administrations). In the North, state intervention from education and health care to agricultural subsidies, as well as protected markets in Europe and North America, along with cheap raw products from the developing world, guarantee their citizens the highest material standards of living in the world. This may be considered a form of "global economic Apartheid", keeping Sub-Saharan Africa and other Lesser Developing Countries backwards and stagnant at all levels, economically and socially. A few living off the backs of the rest of the world cannot be sustainable.

Industrialization, which Europe and North America experienced in the 21st century, has escaped Sub-Saharan Africa. Where industrialization has taken place, corporate mercantilists, moving to areas with cheap labor, tax breaks and minimal environmental protection, are transferring industrial production costs to society and banking those unpaid costs as profits. The net result is more poverty and less education for average Africans/Developing World and increased profits for the

multi-nationals and the already super-rich, often political elite of the host country. Up until now, in most cases, no middleclass has been created and pollution, both in the work place and externally, has been a major problem. One has to only visit Mathare, Kibera (about 1 million people living there) and other slums, and observe the pollution to see industrialization and urbanization gone awry around Nairobi and Athi River, Kenya.

14.1.15 Eco-Colonialism and Eco-Genocide Resulting from Foreign Aid in Sub-Saharan Africa

The “export-led growth” model on which the fund and the World Bank insist, is a purely extractive one, involving more “mining” than management and conservation of resources (e.g., timber, mining, fishing, soils).

At the same time, the West through the IUCN, bolstered by Western preservation, conservation and development NGOs, pressurize Sub-Saharan African countries through donor handouts and perks for the political elite (e.g., *per diem* trips, scholarships, vehicles and computers, etc.), to place 10% or more of their land into park and protected areas, which exclude rural Africans from accessing their resources. Reminiscent of colonial history, this is resulting in the increased impoverishment of rural Africans, as a result of continual compression onto land that cannot support them economically, nutritionally or ecologically.

A Western urban majority, desiring to escape from the concrete jungles of the big cities, perceives nature as a pristine environment, untouched by human hands, a nirvana bathed in warmth and beauty that cleanses and heals the soul. This assumes a mythical “Wild Africa” that never existed prior to colonization, people always being an integral part of African ecology. On the other hand, rural, impoverished, subsistence-living communities perceive a need to live from the

resources contained in these natural systems, and are alienated from the urban perceptions and desires of rural landscapes imposed on them. This is resulting in a clash of cultures and livelihoods across Sub-Saharan Africa, as the urban world, controlling both wealth and politics as exemplified by foreign aid, wants exclusion zones.

For instance, in 2004 the following percentage of Sub-Saharan African countries are in protected areas as defined by the IUCN, for the most part, exclusion zones for rural communities:

Botswana, 30.19%	Burkina Faso, 15.36%	Cameroon, 15% heading towards 30%
CAR, 16.59%	Congo, 14.25%	Ethiopia, 16.86%
Ghana, 15.46%	Malawi, 16.28	Namibia, 18.3%
Tanzania, 39.85%	Uganda, 26.29%	Zambia, 41.49%
Zimbabwe, 14.72%		

In blunt terms, the “biodiversity conservation”, exported by the West to Sub-Saharan Africa and other developing regions of the world, is for rich Americans and Europeans who can buy their food in a supermarket.

An important point that needs to be made is that rural Africans have never been sustained solely on farm production, as purported by Western donors and NGOs. Farm production has always been complimented by resources extracted from natural systems. This is one reason integrated rural development of the 1970s/80s pushed by the West failed – attempting to solve all the problems on the farm (e.g.,

agro-forestry, fish farming, farming cane rats, farming herbal medicine, etc.), when right next door, in secondary fallow or natural forests and savannas, these resources were in abundance. Although increasing human populations require more intensive management of these wild resources to assure their sustainability, the Western solution of creating more protected areas that cut off rural communities from accessing their natural resources is doomed to failure.

As in the past, under colonialism, the outcome is ecological degradation and resource mining in the compression areas, with parks and protected areas becoming hard-edged as a tidal wave of poverty risks to inundate and consume the exclusive playgrounds of Western researchers, hunters and eco-tourists. In creating these areas and in placing themselves in direct conflict with rural livelihoods, biodiversity is being jeopardized in the long run by forcing rural people to poach, since legal access is not possible. This is resulting in the creation of “Open Access Resources” in protected areas being mined for short-term gains by rural Africans out of anger, frustration and the need to survive and in worst state conditions, in eco-genocide through destruction of traditional hunter-gatherer and nomadic minority cultures. Once clandestine access to resources occurs, the sustainable management of wildlife and other natural resources becomes difficult since it is impossible to monitor the offtake, with the ultimate result being habitat and resource degradation; a loss to both local communities and to the world’s urban majority. Where revenue sharing exists, local communities receive a pittance of the net profits. Rural Africans quickly learn to hate NGOs and Caucasians, who appear to be more concerned about wildlife than people, and “their” governments whom they see as having sold their lands and natural resources to foreigners.

Meanwhile, African governments are threatened and dictated to by Western animal rights NGOs, for instance: 1) with tourism boycotts if wildlife is given back to the landowners that allows maximizing income from trophy hunting in

Kenya, 2) tied-aid as in Kruger National Park, South Africa, in which a condition was no elephant culling, or 3) threatened boycotts of the tourism industry if elephant culling takes place in national parks and protected areas (e.g., in Botswana) to conserve biodiversity and habitat, as well as to sustainably generate food and income. Welfare dependent African countries, who know what interventions are needed to sustainably manage and generate maximum wealth from their natural resources, consumptive and non-consumptive, are being hampered from doing so by an urbanized West that lacks ecological, cultural and economic understandings of the links between people and their environment in Sub-Saharan Africa.

Foreign aid funneled through Western NGOs via Global Environment Facility (GEF) programs supported by the World Bank, E.U. and U.S.A., including Transfrontier Conservation Areas (TFCAs), are at the basis of this eco-colonialism at the beginning of the 21st century. For instance, a Global Environment Facility (GEF) program in Southeastern Cameroon has resulted in Baka Pygmies losing 70% of their forests to safari hunting blocks and parks. The Baka or “Forest People,” the only group capable of living for extended periods in the forest to protect its resources, have been expelled and confined to narrow “Community Hunting Area, Cameroon/*Zone d’Interet Cynégétique a Gestion Communautaire (ZICGC)s*” along major roads, where human populations are concentrated and where wildlife already tends to be over-harvested. The expulsion and marginalization of rural people from accessing their natural resources in the name of conservation might be considered a form of eco-genocide; though to date, no one has been held responsible. This is not new and is a repetition of colonial policies that destroyed cultures across Sub-Saharan Africa, such as the Waliangulu of Tsavo National Park in Kenya, the Ik of Kidepo National Park in Uganda and the Bassari of Niokolo Koba National Park in Senegal, and continues today with, amongst others, the Basarwa/San in the

Central Kalahari Game Reserve (CKGR) (in 2006 high court ruled San illegally evicted from this ancestral land and should be allowed to return) and the Baka Pygmies, as well as just north to the Baveuk, Babouté and Bouté ethnic groups around the newly established Mbam and Djerem National Park and associated hunting blocks in Cameroon.

“Revenge killings” of lion, elephant and rhino in East Africa by Maasai, who have co-existed for centuries with wildlife, illustrate the frustration of rural people. The September 2005 de-gazetting of the world famous Amboseli National Park, Kenya, could prove positive if taken advantage of by the Maasai, or could prove to be the beginning of a reversal in which human population pressures accelerate conversion to man-made systems of Sub-Saharan Africa’s natural areas by those who have been alienated by this form of conservation elitism.

Ultimately, for many indigenous Africans, conservation policies have meant a loss of anchors linked to their cultural and social identities. All over Sub-Saharan Africa one observes incidences of indigenous people kicked out of their traditional world, inadequately prepared to join in the new outside world to which they are exposed – mostly a Western and, more recently, a global world in which they are ill prepared to compete, both psychologically and intellectually, lacking an appropriate education. Alcoholism is a major escape, similar to problems in North America on Indian reservations.

14.1.16 Community-Based Natural Resource Management

In an attempt to rectify some of the inequalities of the past, beginning in the late 1970s in Zimbabwe, a program began to share economic benefits from wildlife with rural communities as a means of coercing them into modern conservation ethics. This became known as Community-Based Natural Resource Management (CBNRM), but appears under many names, including Integrated Conservation and Development (ICD), Community-Based Conservation (CBC), Community Wildlife Management (CWM), Collaborative (or Co-) Management (CM) and Protected Area Outreach Projects.

CBNRM has tended to be about management and benefits from “Common Property Resources”, below government at the level of village or cluster of villages and an assumed homogenous society. However, it is being recognized more and more that many rural small-scale societies are heterogeneous; economically stratified with various resource users vying for access to a given geographic area, and porous with people coming and going, especially in recent times as rural livelihoods more and more depend on remittances from urban centers for survival.

Traditionally, it was about communities living outside of parks, benefiting from the sustainable use of resources in these areas, especially wildlife from trophy hunting; the Southern African model. It tended to be high-jacked by Western donors and NGOs. Too often, it has been “talk community”, but act “neo-colonial”, maintaining the same old ties between a predominantly white safari and tourism industry and governments, along with modern-day evangelists – conservation NGOs. There is a general failure to devolve land and resource tenure to local communities, with continued exclusion of rural people from these natural areas. Too many stakeholders have too much to lose if title to wildlife and

land are fully returned to their rightful owners; traditional rural small-scale societies. Little of the profits from valorizing the subcontinent's natural resources are reinvested back into conservation or development, most of the wealth being expropriated by elites and the mostly expatriate private sector into overseas bank accounts and urban lifestyles.

CBNRM is part of the solution to conservation and development, but on its own will fail since, while it may serve as a catalyst for development, economic and social impacts at the level of households are negligible, providing the equivalent of:

- US\$ 18.8/household/year, CAMPFIRE Zimbabwe;
- US\$ 17/household/year, ADMADE, Zambia;
- US\$ 5.90-9.39/household/year, Tchuma Tchato, Mozambique;
- US\$ 79-196/household/year, Nyae Nyae, Namibia;
- US\$ 2.41-12.43/household/year, Cullman/Hurt, Tanzania;
- US\$ 2.25-2.79/household/year, Selous Conservation Program (SCP),
Tanzania; and
- US\$ 872-9,577/household/year, Botswana Community Trust Program.

Too often, this revenue never reaches the households, being used for Common Property Benefits (e.g., roads, schools, clinics, boreholes and grinding mills).

CBNRM is often too narrowly focused on a limited use of the resources (e.g., hunting of wildlife or ecotourism). CBNRM, as currently practiced in Sub-Saharan Africa's communal areas, yields about 85% of net profits to governments and the private sector (largely expatriate) primarily from safari hunting and ecotourism, leaving about 15% for rural communities.

Even if this disparity in benefit distribution can be rectified, in much of Sub-Saharan Africa the ratio of resource base to people is so low that in most cases potential benefits would still be insignificant at the level of households. For

instance, the figure on CAMPFIRE is based on generating US\$ 15,856,128 million in the 11 year period from 1989-1999. However, when split between about 95,000 heads of households each year, the amount becomes insignificant. Even if you could triple the amount to between US\$ 45-48 million over this time frame, the benefits per household are still very small.

In fact, as currently practiced, the household often gives up more than it receives from CBNRM – access to the diverse array of natural resources (wildlife, timber, charcoal, thatch grass, fish, honey, other wild food, medicine, etc.) in these protected areas in return for “Common Property Benefits” (schools, clinics, grinding mills, boreholes) that remunerate the community, but not the individual and/or his/her family. As a result, at the level of the household, people are often poorer as the result of CBNRM, which on its own does little to convince communities or individuals to “buy-in” to modern conservation concepts that are exclusionary. CBNRM, as currently practiced, might even be considered a failed communist experiment, where Sub-Saharan Africa’s true entrepreneurs (e.g., traditional hunters, fishers, sawyers, charcoal makers, honey collectors, traditional medicine collectors, etc.) are marginalized and criminalized from using resources, in favor of valorizing resources through mostly expatriate companies.

Kept relatively ignorant, most communities in Sub-Saharan Africa have little understanding of the potential value of wildlife and other natural resources on the international market and are thus easily taken advantage of and maintained dependent on governments, the private sector and NGOs in the management and marketing of their resources – all middlemen who directly (governments and private sector) or indirectly (governments and NGOs) live off the community’s resources. Donor funding for CBNRM becomes a major source of income for governments and NGOs, with purported decentralization resulting in increased centralization of control over natural resources by the state. This is often

encouraged by NGOs (eco-missionaries coming to save Africa from Africans) who make themselves indispensable middlemen that are needed to “help” communities meet the myriad of bureaucratic red tape imposed on them in order to legally access resources they had sustainably managed on their own for centuries. Western money implies Western NGOs/experts and thus imposition of Western value systems that are unacceptable to other cultures, especially those whose precarious lives depend on accessing these resources; eco-colonialism (e.g., CAMPFIRE in Zimbabwe, Southeastern Cameroon, Congo Brazzaville, Kenya, Tanzania).

Concern has been raised that Transfrontier Conservation Areas (TFCAs) increase the scale of this centralization and disenfranchisement. Rather than helping rural communities manage these resources, Western donor money through NGOs continues trying to exclude local people from their access on an even grander scale.

14.1.17 Inappropriate Uses Of Western Technology In Sub-Saharan Africa

Inappropriate use of Western technologies has been funded by Western donors and put into place by Western companies and NGOs, such as dams on rivers and boreholes. Dams are big business, with little or no accountability to design and construction companies, governments or donors. While environmental assessments are undertaken, mitigative measures are rarely implemented, especially artificial flooding to maintain downstream ecosystems. Major impacts of dams in Sub-Saharan Africa include:

- A downstream loss of flood plains adversely impacting recession agriculturists, herders, fishermen (e.g., 500-800,000 people impacted in Senegal/Mauritania from Manantali Dam, Mali; 350,000 from Cahora

Bassa Dam, Mozambique; hundreds of thousands from Kainji Dam, Nigeria);

- A decline of floodplain fisheries;
- A decline in dry season pasturage on floodplains for livestock and wildlife;
- A loss of floodplain wetlands for migratory birds;
- A decline of estuarine/marine fisheries;
- A displacement of people and/or loss of habitat within inundation zones behind dams (e.g., 57,000 people displaced by the Kariba Dam in Zimbabwe/Zambia; 42,000 displaced by Cahora Bassa Dam Mozambique; 84,000 displaced by Akosombo Dam, Ghana; 120,000 people displaced by Aswan High Dam; 44,000 from Kainji Dam, Nigeria; 24,000-30,000 farmers lose land from three dams in Lesotho); and
- An increase in aquatic borne diseases such as malaria and schistosomiasis.

From a combination of increases in human/livestock populations, as well as the inappropriate placement of boreholes without providing extensive livestock systems with training to move into intensive management, by the mid-1980s, 90% of Sahel-Sudan grasslands and 80% of Southern Africa's grasslands were/are over-grazed.

The world's coral reefs may be in greater jeopardy than tropical forests. By 1998, 11% of the world's coral reefs had been destroyed by human activities and 16% had been damaged by global warming. Currently, of the 6,800 km² of reef off East Africa, 12% has been destroyed, 23% is at a critical stage - soon to be destroyed unless remedial steps are taken - 25% is threatened and 40% is under low or no threat. Meanwhile, while not built out like the Florida Keys or the Caribbean islands, East Africa's coastal zones are slowly being discovered as a pristine tourism Mecca. There is little or no sensitivity for the implications of

land-based pollution, especially from inappropriate sewage technologies adopted by coastal strip development for tourism that can destroy the very attractions that bring in the tourists: white sandy beaches, clear blue waters, seafood, coral reefs, SCUBA diving and sportfishing. Very often, with pressure from Western NGOs, marine parks are created, excluding rural fishing communities, blaming the demise of coral reefs on over-fishing of herbivores “Top-down” hypothesis rather than dealing with the more complex issues of nutrient pollution from sewage (often from insensitive temperate climate tourism developers) and land-based pollution in general from watershed degradation – “Bottom-up” hypothesis. While over-fishing can be an issue, fishermen are more often the victims rather than the major cause of this problem. There is a movement afoot to involve local fisher communities in coastal management.

Coral reef ecosystems collapse as result of being smothered by epiphytic algae (benthic macro-algae) that out-competes corals under nutrient enriched conditions. Epiphytic algae prevents zooxanthellae (a symbiotic algae living within the coral polyp - providing the coral with food and giving it color) from photosynthesizing and prevents polyps from filtering micro-organisms out of the water column. With its food supply cut off, the coral starves to death. Sedimentation and pesticides from degraded watersheds can also be an issue. Once the coral reef dies: 1) Major beach erosion occurs as the reef, that provides sand to nourish the beaches and protection of the beach against wave and storm action, is gradually broken down, 2) The loss of habitat results in a decline in artisanal fisheries, 3) Increased eye, ear and skin infections and diarrhea become the norm among swimmers/bathers and 4) Ultimately, there is a decline in tourism.

While global ocean warming has become a major issue, resulting in coral bleaching and a major die-off of coral reefs in the Western Indian Ocean since

about 1998, this must be dealt with on an international level through such forums as the Kyoto Protocol. On the other hand, land-based pollution including sewage, and over-fishing are issues that individuals, communities and governments can deal with directly.

14.1.18 Resource Wars Fueled by the West in Sub-Saharan Africa

Foreign multi-nationals, in collusion with Western governments, have played off various factions of tribal and political elite to access Africa's riches (e.g., oil, minerals, timber), often vying for control over access to these resources through proxy wars, using African governments and armies. Towards the end of the 20th and at the beginning of the 21st century, this has been especially true between the French and Americans, as well as various African elites who are vying for the riches of Francophone Africa's oil in the Gulf of Guinea and the mineral wealth of the Democratic Republic of Congo, amongst others. In the Democratic Republic of Congo, this has resulted in Africa's first "World War".

Cheap oil fuels America's economy. Global oil discoveries peaked in the mid-1960s. U.S. oil production peaked around 1970 with imports accounting for 66% of its oil and petroleum products in 2005. Global oil production is predicted to peak between now and 2040, while unfavorable political and investment conditions exist where 60% of the world's oil reserves are located. By the year 2015, the USA expects to obtain 25% of its oil from the Gulf of Guinea. Access to this oil becomes even more important in lieu of chaos in the Middle East and crude oil surpassing US\$ 75/barrel by April 2006 and US\$ 80/barrel by mid-September 2007.

Government elite, in cahoots with Western government and multi-nationals, expropriate the wealth of rural communities (e.g., wildlife both consumptive and

non-consumptive, minerals, timber, etc.) into overseas accounts. There is little investment by governments in providing basic services such as infrastructure, health care or universal education. Thus, even in the 21st century, it can be argued that in much of Sub-Saharan Africa, democracy becomes a façade for communist-like politburos doomed to ruination of the subcontinent, while the true owners, small-scale rural societies, are disenfranchised and forced to live in poverty.

As a result, compared to the West, there is limited buying power, the failure to develop consumer societies and little demand for transformed products that would stimulate local industry, trade and ultimately, national and regional economies. The net result is that economies are stagnant and/or declining on the resource richest continent in the world.

14.1.19 The Brain Drain

The ultimate “slap in the face” to Sub-Saharan Africa is the overt or subvert stealing of Sub-Saharan Africa’s best and brightest. An estimated 30-40% of college graduates from Sub-Saharan Africa have immigrated to developed countries including the U.S., Britain and France (e.g., Gambia/63%, Ghana/46%, Kenya/38% and Angola/33%). This has occurred by providing scholarships and allowing the brightest to remain in America and Europe. Or, as a result of stagnating and/or declining economies knowing that those receiving scholarships to America and Europe will do anything not to go back, where someone with a masters or doctoral degree can make more as a taxi driver or student assistant than working back home in their profession. In some cases, there is active recruitment (e.g., nurses to England). UN statistics show that professionals leaving Africa to work abroad increased from:

- 27,000 from 1960-1975;
- 60,000 from 1985-1990; and
- 200,000 from 1990-1999.

Other's estimates are even higher, with as many as 640,000 African professionals living in the USA, of which 360,000 have PhDs.

The pace of the diaspora is accelerating. Today, up to 70,000 Africans/year are fleeing the continent in search of a better life. There are more African scientists and engineers working in the USA than in Africa. By some accounts, there are as many as 840,000 South Africans in London and many more in Canada, Australia, New Zealand and the USA. An estimated 1,800 African health workers emigrated between 1960 and 1975, increasing to 8,000/year by 1987 and to 20,000/year during the 1990s. Nigeria alone has an estimated 33,000 doctors living in the USA. The EU's planned "blue card" will be used to "cherry pick" the best and brightest from Africa to fill job vacancies left by an aging populations. This loss of educated manpower is hurting Africa's chances for success. Similarly, on a continental scale, many of the subcontinent's brightest who cannot make it overseas are flooding to South Africa and filling posts, while the influx of illegal and uneducated Africans into South Africa is placing a tremendous burden on its social (education and health systems), as well as physical infrastructure (e.g., water, sewage, housing, roads).

14.2 THE WAY FORWARD –A ROADMAP FOR THE FUTURE

This paints a very bleak picture for Sub-Saharan Africa. How can Africa get out of this seemingly "free fall" without a parachute? The following is a roadmap that might be considered by African leaders, implemented through the New Partnership for African Development (NEPAD), if it can avoid the neoliberal

policies of the Washington Consensus. The roadmap presented in this book is not arrogant enough to think that it has the solution for the continent. Previous chapters provide decision makers with a historical perspective of what put Sub-Saharan Africa in this predicament. To understand the future you must understand the past. This “roadmap” attempts to integrate a set of interlinking ideas presented in previous chapters that can, through careful planning, be implemented to change the way Sub-Saharan Africa is functioning. What is needed is not “rocket science”, but a break away by Africa and Africans from continuously having Western solutions to achieve Western objectives imposed on the subcontinent, usually to the benefit of the West, but to the detriment of Africans and their natural resources. Major paradigm shifts will be needed as to how Sub-Saharan Africa relates to the West and visa versa, as well as how Sub-Saharan Africans relate to each other locally, nationally and regionally across the subcontinent. A long-term vision will be needed for Sub-Saharan Africa to escape out of these doldrums.

It should be made very clear that if significant change cannot be achieved over the first half of the 21st century, Sub-Saharan Africa’s people and its mega-fauna will all be in jeopardy. Failed rogue states will evolve (e.g., more Somalias, eastern DRC), which are ungovernable and that will fall outside the attempts of global cooperation through such bodies as the United Nations and the World Trade Organization (WTO). In addition to threatening the future of civil society, environmental degradation will accelerate, jeopardizing Africa’s natural resource base. Anarchy will reign on the continent and civil wars and strife over scarce resources will be the norm (e.g., as already seen in the DRC, Ivory Coast, Liberia, Sierra Leone, Niger Delta). Genocide (e.g., Darfur, Rwanda, eastern DRC) will increase as ethnic factions vie for control of the remaining resources. Coastal mega-cities will become Africa’s jungles, where the majority living in their slums will be stalked by two-legged predators and any hope for Foreign Direct

Investment (FDI) will be lost, as capital (both human and financial) and technology flee the continent. The elite will live in gated communities (as is the current trend in South Africa) with electric fences, rapid response Private Military Companies/Contractors (PMCs)/security as the only option to an over-whelmed police force.

Europe and industrialized South Africa will be inundated by a tidal wave of poverty escaping these failed nation states, and worse – many of the disenfranchised and disenchanted youth will provide the foot soldiers that fanatical terrorist movements seek to carry out their ideological war against what most of them perceive as an opulent West living off the backs of the developing world. Africa is on the verge of becoming a Muslim continent of which Sub-Saharan Africa alone has an estimated population of 250 million Muslims or 20% of the World's Muslim population. Though Muslims are traditionally moderate, poverty, corruption and political alienation are contributing to the spread of radical Islam in Sub-Saharan Africa such as in Sudan, Somalia, Eritrea and Kenya, while Nigeria with 60-million Muslims has already seen Islamic law adopted in the north, often contributing to religious tensions and violence. The 1998 bombings of U.S. embassies in Kenya and Tanzania are omens of worse to come unless the subcontinent sees major changes in its residents' quality of life.

It appears the mastermind of the July 2005 London subway bombings may have used Southern Africa as an operational base. A flood of lumpens is beginning to inundate Europe, as epitomized in 2005 by 11,000 Sub-Saharan Africans trying to scale the razor wire fences in the Spanish enclaves of Ceuta and Melilla on Morocco's Mediterranean coast, and more recently in 2006, 32,000 illegal aliens from West Africa arriving in the Canary Islands in hopes of gaining access to the mainland and a new life. For the West to maintain a decent quality of life, it will

be required to uplift and provide hope for a better future to populations of the Third World.

This decline can be stopped, but it will require a concerted effort by African leaders to do what is right for their people. In addition, the West will have to develop a win-win relationship with Sub-Saharan Africa instead of seeing it as a continent of plunder, which it has been since the first contact with Europe and which continues unabated at the beginning of the 21st century through resource extraction.

The West needs to wake up and realize that while separated by seas and oceans, the future of Africa may very well hold in its hands the future of Western civilization as we know it today. Neither segregation in America nor Apartheid in South Africa were sustainable and the materialistic lifestyle of the West, if it depends on living off the developing world, keeping its people in a perpetual state of downward spiraling poverty and hopelessness, is also not sustainable. Terrorism has been around since the beginning of humanity. It is how the weak have stood up to abuse by the powerful, and can only be overcome in developing win-win relationships with the rest of the world.

14.2.1 Policy Changes for Sub-Saharan Africa

14.2.1.1 Education

General

A “massive” emphasis on education at all levels, primary, secondary (high school) and tertiary (university) must serve as the basis for the road map – an education that links traditional African values to modern Western intensive

management systems that the continent must “adapt” not “adopt” within its socio-cultural framework. This will help Africa benefit from both regionalization and globalization and address resource degradation from over-population. Education must take place in Sub-Saharan Africa, with South Africa playing a major role through NEPAD in first helping to educate Africans at its First World tertiary institutions, creating a generation of Africans who can find “African solutions to African problems”, forgoing the need of having “experts” from the West imposing ideological and technological solutions that often meet neither the ecological nor socio-economical needs of the continent. For instance, though not having an adequate plan to absorb youth back into the country, Botswana has wisely used its revenue from diamonds by investing in its youth, sending thousands on scholarship to universities, many in South Africa. Botswana, its people and its economy will become a better place because of this effort. In the long-term, South Africa, through the NEPAD process, must help strengthen and reinvigorate tertiary training on the rest of the continent. The use of Interactive Telematic Education (ITE) to broadcast university classrooms from South Africa across the subcontinent should be considered. A major challenge within South Africa is to improve the standards of its primary and secondary education in the townships and rural areas so school leavers can compete at the university level rather than dropping the standards of its tertiary institutions to meet prescribed graduation quotas!

Appropriate education, allowing Africans to join a global economy, will help take advantage of the growing rural exodus, drawing more youth out of these areas, thereby taking pressure off Sub-Saharan Africa’s ecosystems, most of which are degraded from overpopulation by humans and livestock. This will require training in such diverse areas as business, accounting, marketing, information technology and engineering.

Adult, education – yes, there is likely some value in this, but the future is in Africa's youth and if education is practical, especially in the rural areas, why cannot youth serve as “agricultural extension agents” to their families and villages, where governments given limited resources are unable to completely fulfill this task. In less than a generation, with appropriate education, as exists in America and Europe through vocational schools, those youth choosing to remain in rural Africa will become the farmers already trained in appropriate technologies and not needing “adult education”. Then there is the age old adage, “you cannot teach an old dog new tricks” so work with the puppies.

The West must assure that any student sent overseas on a scholarship be legally, as well as morally, bound to return to his/her country of origin, contributing to the betterment of his/her society. Care must be given to tailoring education to the need, over-educated individuals often being unwilling to return to rural areas or even to their countries. Experience shows that students coming out of structured programs, such as community-based conservation and development NGOs, tend to be more willing to return on completion of their studies, reintegrating more easily back into their society. South Africa must look deeply within as it begins to play a similar role in being a major service provider in education on the subcontinent. If this means revoking his/her visa to assure the student's return to his/her country of origin, so be it.

Agricultural Education

As a part of this educational program, there is a need to develop agricultural training and “future farmers of Africa” programs in primary and secondary schools for those youth who choose to remain in rural settings. In addition, taking advantage of Africa's racial diversity, as young Africans graduate from tertiary agricultural training, there is a need to develop on-the-job training programs with

commercial farmers and agro-industries. They must be “apprenticed” on these farms until they can run and manage such operations, from planning crop production to managing farm labor, soil and water quality monitoring, soil conservation and fertility management and use of technologies such as drip irrigation that will have to be adapted to make these processes sustainable. They must be trained to make decisions, not take orders, as has been the case under colonialism.

The current commercial agricultural technologies are mostly in the hands of white Africans. These technologies must be transferred to small and medium black farmers where appropriate, taking them from subsistence into commercial agricultural production. Already, South Africa has pilot “mentoring” programs teaming up white commercial farmers with small black farmers and/or carefully selected black agricultural students showing entrepreneurial skills from tertiary institutions. Nigeria is inviting disenfranchised Zimbabwean commercial farmers to re-establish, farm and train small Nigerian farmers in the latest technologies. If Sub-Saharan Africa is to survive, tribalism, racism and other socio-cultural and political constraints will have to be put aside, and all Africans will have to work collaboratively.

Wildlife and Range Management Training

The largest portion ($\approx 75\%$) of Sub-Saharan Africa consists of the savanna biome, whose best land use is in livestock and wildlife. There is a crying need to send off youth from these rural areas to be trained in modern concepts of intensive wildlife/range management and expose them to the potential for consumptive and non-consumptive tourism in these areas that can serve as a catalyst for rural development.

Youth representing rural communities, trained in this sector at the tertiary level, can help their communities demand and take back control over their land and associated natural resources. Protected areas must be developed by educated rural Africans returning to their communities, which integrate the needs of rural communities into the management of these areas, as opposed to the current trends where communities are still being cut out and intermediaries are still reaping the majority of the economic benefits. Until the majority of people comprise an urbanized middleclass, there is little room for preservationist exclusion zones, which risk disappearing under a wave of human poverty that sees no value in their existence and which is a foreign concept to most Africans, imported from Europe and America.

Mid-level training can be obtained in Africa's classical wildlife colleges such as Mweka in Tanzania and Garoua in Cameroon, along with the more recent Southern African Wildlife College. However, these institutions need to move away from their colonial roots of training paramilitary forces to fight rural communities. The philosophy of these schools and their curriculum needs to be redesigned to train wildlife extension officers and ultimately, community members to sustainably management the multitude of wild resources in their areas, not in cutting them off from survival.

At the tertiary level (university level), South Africa has First World quality educational programs that have taken Western concepts of intensive resource management and adapted them to Sub-Saharan Africa. Training in intensive natural resources management will be necessary due to previously appropriate extensive management systems being usurped by an ever-expanding human and livestock population. South African universities, national parks, provincial nature conservation authorities and private game ranches know more about managing their indigenous fauna than any people on this planet and it is precisely this

knowledge that must be transferred throughout Sub-Saharan Africa. The pool of savanna ecological expertise in South Africa is the world's best chance at establishing intensive range management on the subcontinent, so necessary as a result of increased people and livestock in the last century, resulting in more pressure on a declining per capita and gross (e.g., savanna taken out of production by conversion to farms) resource base. As they are situated on the African subcontinent, South African universities reflect the needs of their citizens who are still closely tied to living directly from nature, promoting sustainable use of wildlife as a land use, often not recognized by Western universities and donors.

These universities are much more affordable than European and North American universities (e.g., US\$ 7,000/year all inclusive, including transport, compared to US\$ 15,000 minimum in most American universities), and relevant since they train people in the sustainable management of African wildlife and habitat.

On returning, trained youth must take these concepts of intensive resource management from what the White Mountain Apache's call the "white man's world" and integrate these into traditional management systems linked to social controls, ancestors and the spirit world. Traditional control mechanisms such as hunting guilds, chiefs and elders, taboos, totems and territoriality can comprise important components of this integration. Where feasible, traditional resource users need to be invited into the classrooms to lecture students on knowledge that is rapidly being lost.

Similar to the "Foxfire" series of books on traditional knowledge in Appalachia, USA, there is a need to record and capture this knowledge in writing and on film as both an educational tool and to archive knowledge and beliefs that may disappear in the next generation as society urbanizes and traditional ways of life, other than for a few, become a thing of the past. Recording such information and

suggesting how to integrate it into modern intensive resource management concepts can be undertaken by Africans for advanced degrees.

Initially, one of South Africa's roles, through the New Partnership for Africa's Development (NEPAD), should be to educate people from the rest of Africa, eventually linking to other tertiary institutions on the continent and bringing up their standards of education, which have declined drastically since independence. The long-term goal must be to have the majority of Africans trained in their country of origin. These basic concepts will equally apply to range management for livestock.

Forestry, Fishery and Coastal Management

Similar training needs will be required for other natural resources. Over much of the subcontinent, sustainable forest management will be critical to sustainable wildlife management, especially in forested savanna and tropical lowland forest environments that provide habitat for wildlife. With the exception of South Africa, it should not be forgotten that charcoal is still the major source of energy for the majority living in the urban centers of Sub-Saharan Africa.

Information Technology

Through collaborative efforts with the West, information technology (IT) will provide major job opportunities in Africa's urban centers as we move into the 21st century.

There is a crying need to improve information technology training linked to improved telecommunications in Africa. Beginning at the primary and secondary schools, children need to be hooked in so that computer and information

technology starts out as a play thing that they grow up with as a natural part of their lives, as has happened in North America and Europe.

A good example for a start is in Uganda, where President Museveni and the U.S. Agency for International Development (USAID) have signed a US\$ 14.3 million agreement that would make Uganda the regional information technology center. This includes the establishment of ten network academies within Uganda's university system that are partially funded by the Leland Initiative; a U.S. Government effort aimed at connecting African nations to the internet, helping Uganda position itself as a major player and regional center for the computer services market in Sub-Saharan Africa. South Africa is just about there at the university level, though a major effort is needed in townships and rural primary and secondary schools of the previously disadvantaged. South Africa has more than 400 call centers, many serving British "help lines" (e.g., insurance companies) employing 80,000 people.

Industrial Vocational Schools

In parallel with the industrialization of Sub-Saharan Africa to transform its raw products, vocational schools and apprenticeship programs must be developed so that there are trained Africans capable of being absorbed into these industries. For instance, the National Open Apprenticeship Scheme (NOAS) in Nigeria links education to the workplace through practical training under master craftsmen in industries such as docking and railways, training over 600,000 youth in over 80 trades since its inception in 1992; 400,000 of whom have started their own micro-enterprises.

14.2.1.2 Land and resource tenure

After education, giving ownership back to rural communities of their land, wildlife, fisheries, timber and mineral resources must take place if these resources

are to be used sustainably and are to play an important part in the development of African economies. This will allow the wealth from these resources to circulate, creating consumer societies. Until this takes place, any talk of democracy in Sub-Saharan Africa is a façade over-shadowed by a superficial process, one-man-one vote multi-party elections that will have little, if any, impact on the average person's life. It might be argued that Sub-Saharan Africa's first revolution was against colonialism. A second revolution is underway, the battle by communities to recapture land and associated resources from the governing elite in obtaining the right to benefit from their sustainable management (e.g., oil in the Niger Delta, Tuareg in Niger over uranium, Bushmen fighting to take back the Central Kalahari Game Reserve (CKGR), land claims in South Africa including within Kruger and other parks).

Empowering local communities to control their own land and resources, integrate their cultural values into resource/land use management plans and insuring that the wealth of rural Africa stays in rural Africa should help maximize the opportunity for reinvestment of this wealth in helping to create physically and mentally healthy children and adults, capable of learning and able to afford an education that will allow them to fit into a global society. These community resource companies should use a large portion of their profits to provide scholarships to local youth to study at tertiary universities, vocational and technical schools. This should help to take pressure off the rural resource base, as the majority of educated youth will opt for work in urban settings, assuming that conservation and development plans fit into a bigger plan for the subcontinent, which provides employment opportunities in urban settings.

It is hoped that empowerment of local people and integration of their culture into the management of resources on their lands will help provide a psychological boost to rural communities as they regain control over their destiny - as opposed

to being dominated by governments, NGOs, safari and tourism operators who have traditionally controlled access over and marketing of their resources, rewarding rural communities with a pittance for remaining “observers on the sidelines”. As “active players on the field”, this should help increase the feeling of security over controlling their lives, allowing them to determine the speed and degree to which they make a transition into modern society versus what they prefer to retain of their traditional lifestyles as a “cultural anchor”. This should minimize “escaping into the bottle” (alcoholism) that is so prevalent among transitioning traditional societies such as Bushmen, Pygmies and American Indians who have been expelled from their traditional world, but who are not adequately trained to fit into the new global society confronting them and who feel a loss of control over their destinies. This feeling of control over their lives, psychological well being and cultural anchor from ownership over “their” land, wildlife and other resources may be more important in the short-term than meat and money, rewards from conservation that CBNRM is so reliant on, but which fall short of significantly impacting heads of households. Certainly, it is the beginnings of grass roots bottom-up democracy.

It will be important to carefully assess the pros and cons of communal versus individual ownership of property and associated resources within the framework of rural African societies, given current resource/population ratios. Very often communal ownership over land and natural resources, within the African cultural context, may prove more sustainable than handing over individual ownership of resources. It is critical that, however it takes place, the privatization of land/resources retain not only economic/ecological integrity (e.g., minimal land size to avoid subdivision), but also socio-cultural integrity so often ignored in the past, in order to avoid continued resource mining and habitat degradation.

Strong consideration should also be given by governments to allow controlled access multiple-use of resources by communities in parks and reserves based upon zoning and a monitoring program to assure sustainability. For instance, facing the facts of many areas being surrounded by hard-edged poverty and uncontrolled poaching, Malawi some years ago began allowing controlled access to its parks and reserves for various resources as a means of assuring sustainable offtakes. Cameroon is beginning to allow rural residents access to its national parks to access certain natural resources. A Tshwane University graduate, managing the new 7,500 km² Quirimbas National Park, Cabo Delgado, Mozambique, rather than kick off the 100,000 residents, is recognizing traditional territories and working with the communities to sustainably use the resources within their areas while empowering them to stop access by outsiders. This also appears to be happening in Gabon's parks and reserves. This is in essence turning these areas into economic foci while going back to "Common Property Resource" management that will encourage people to become the eyes and ears of reserve managers. South Africa's Protected Areas act of 2003 may also allow such activities. The northern portion of Kruger National Park has already been given back to the Makuleke Community and declared a contractual park, allowing multiple-use, and there are still about 33 outstanding land claims against Kruger. Thus, the possibility of more multiple-use by the approximately 5 million poor living along its borders may be necessary in the long-term to justify the ecological integrity of the park to peripheral communities.

This may require IUCN to redefine a national park and/or realize that in the future, most protected areas will be classified in a lower order that allows multiple-use (e.g., Category VI of the IUCN), if such areas are to survive and at the same time have any meaning to local residents. These latter examples do not result in full devolution, but come very close and are a step in the right direction until communities are fully trained to manage these areas on their own.

Ultimately, such actions may be necessary to preserve biodiversity since this allows active management and monitoring, which clandestine poaching does not. In addition, as wildlife populations increase within hard-edged protected areas that do not allow for dispersal, the excess wildlife can be sustainably harvested before excessive grazing/browsing as a source of economic revenue and protein. Loss of biodiversity from excess habitat degradation as a result of over-grazing by wildlife or from the absence of fire and other forms of traditional human interventions (e.g., northern Kruger Park where forest is taking over and adversely impacting roan and sable populations), or even the closing up of forests in Bwindi, Uganda from elimination of the forest elephant - may require man to become part of the savanna ecology, as he has been since the beginning of time, only this time in a controlled manner to generate wealth at the level of households and community. Ultimately, the world must face up to reality on the ground that if parks and protected areas in Sub-Saharan Africa are to survive the 21st century they will have to serve the interested of the rural impoverished majority, as much if not more than the international elite minority. Land and resource tenure will be at the heart of this survival. One without the other, especially ownership of land without the ownership of the resources on the land may be of little value to rural people and may dissuade them from maintaining natural systems and associated biodiversity. Kenya is a good example, where group ranches own the land, but not the most valuable commodity, wildlife, and are opting for other land uses or selling off the land to be converted into commercial and traditional agriculture.

14.2.1.3 Agriculture

This assumes that tenure problems over land ownership are resolved.

Commercial Agriculture and Food Self-Sufficiency

With food poised to become the weapon of the future, one of the biggest threats to Sub-Saharan Africa is food sovereignty and economic independence. A key to escaping the current welfare relationship with the West is for Sub-Saharan Africa to achieve food self-sufficiency linked to food security. It is imperative that the 27% (≈ 600 million hectares) of Sub-Saharan Africa suitable for commercial and/or high potential, low input agriculture is identified that can help feed the urban masses. Where it is not already over-populated or already degraded, a continental-wide plan must be developed to assure that this land is immediately put into and maintained for commercial food production.

This may require joint-ventures between the private sector (e.g., commercial African farmers, multi-national agro-industry) and small farmers for technology exchange, along with the use of genetically modified (GM) crops, fertilizer/pesticides and other Green Revolution Technologies to achieve this goal on commercially viable soils. No different from the U.S. and EU, it may require Sub-Saharan Africa to subsidize its farmers to get the food production out of its soils needed to feed the continent.

This is extremely urgent in the case of Zimbabwe, a regional food basket whose commercial agricultural lands need to be put back into production as soon as possible. National, regional and continent-wide agricultural development plans are needed for the subcontinent that identify and map high potential soils and plan for the transfer of technologies needed to sustainably exploit them.

Development of Regional Markets

Sub-Saharan Africa must develop regional markets for its commercially produced grains and other products and no longer view subsidized handouts from Western donors as alternatives to Africa being able to feed itself.

Food Security

In some cases, cash crops (e.g., tobacco, cocoa, tea, coffee, etc.), especially if they are transformed in Africa – an imperative – may provide viable alternatives to food self-sufficiency through providing cash for food security, giving Africans in both urban and rural areas the ability to buy their food that in some cases may be cheaper to import than to produce in Sub-Saharan Africa (e.g., rice from Thailand).

Careful Use of Green Revolution Technologies

Irrigation and “Green Revolution” technologies may be of some help, but must be carefully integrated into national and regional plans to assure that they do not destroy traditional ecological and production systems, especially floodplains and estuaries (e.g., by dams associated with irrigation), and do not result in further soil degradation, especially nutrient mining, salinization and water logging. Environmental and socio-economic assessments must be accepted and mitigative measures implemented, not buried on a shelf as window dressing.

Where dams have destroyed floodplain ecosystems and estuaries (e.g., Senegal River Valley, Zambezi Delta) controlled flooding should continue or be strongly considered to bring these systems back into production. Water for irrigation will

have to fit into other needs, such as the partitioning of available water for industrial and potable needs, hydropower, navigation and in some cases, the sharing of this resource between countries in order to avoid “water wars” that could be looming on the horizon.

Research and Extension to Small-Scale Agriculture

It is likely that seed companies from America and Europe, beginning to establish themselves on the subcontinent, can provide much of the extension to commercial farmers, as is already occurring in South Africa.

There is a desperate need to support agricultural research and extension services to the estimated 70 million smallholder families in Sub-Saharan Africa. Given the disappearance of fallow periods, agricultural and land use intensification will be necessary to minimize encroachment on and assure preservation of nature reserves/parks, game reserves, wetlands, mangroves, grassbeds and coral reefs - the latter two affected by sedimentation and the misuse of pesticides and fertilizers in uncontrolled land-based runoff, and other fragile environments.

On the medium/low potential lands, constituting 47.5% of Sub-Saharan Africa, and the 25% that consists of desert/stEEP slopes that are inappropriate for agriculture, the cost of inputs such as commercial fertilizer, lime and pesticides versus increases in yields, may not be cost-effective. To have any chance of sustainably exploiting these marginal areas, research is required into developing appropriate and cost-effective technologies. This includes but is not limited to small-scale irrigation, use of locally manufactured phosphate fertilizers and other soil conservation technologies that link traditional knowledge to modern concepts, such as improved composting, improved wetlands management (multiple-use of floodplains), minimum tillage, appropriate mechanization, improved terracing,

drip irrigation, mini-barrages, etc. Lower cost, Low External Input (LEI) technologies, such as improved fallow agriculture through integrated nutrient management (INM), may be required in such cases. There is a need for agricultural extension agents and anthropologists to work with African elders to capture traditional knowledge about INM (e.g., traditional use of fallow, legumes, crop rotation, green and animal manure, inter-cropping, etc.), vegetative indicators of soil fertility and how these practices link to the sustainable management of other natural resources (e.g., forests and wildlife), both technically and socially.

Research needs to be undertaken into enhancing production of traditional soil and climate adapted “lost grains of Africa” such as Pearl Millet (*Pennisetum glaucum*), Fonio (*Digitaria exilis*), African Rice (*Oryza glaberrina*), Sorghum (*Sorghum bicolor*) and Tef (*Eragrostis tef*). This can be through LIE/INM technologies adapted to improve yields and/or development of improved seed varieties. This research can occur at the very Sub-Saharan African universities training Africans, thereby taking pressure off the limited resources in agricultural ministries. Ideally, extension should be through Ministries of Agriculture, linked to these universities, employing their graduates so that linkages between research and extension are maintained. As noted, it can also be linked to vocational programs in primary and secondary schools located in rural farming areas.

Infrastructure

It is common knowledge that a large portion of Sub-Saharan Africa’s agricultural production is lost to spoilage and pests due to improper storage facilities. Improper storage in the highly humid subcontinent is also a breeding ground for molds and the production of carcinogenic aflatoxins that have a major impact on health. Some say that 40% of the productivity lost to diseases in developing

countries, including Sub-Saharan African is due to diseases exacerbated by aflatoxins, with aflatoxins contaminated diets being linked to liver cancer.

Sub-Saharan Africa has the lowest density of road networks in the world, a mean density of 0.86 km/thousand head of population. Improved road networks are required to make transport of both inputs and produce cost-effective.

Roads are among the most important part of a country's annual budget to maintain and are expensive to build. Falling into more debt and then not being able to maintain this infrastructure is a return to the past. Sub-Saharan Africa must start developing its economies and, in turn, phase in the infrastructure through its tax base. Until an adequate tax base is developed to build and maintain hardtop roads, it is likely that other than the main arteries, a program of regular grading may be more cost effective.

Land Reform

Land reform must be de-politicized in Southern Africa to assure that commercially viable agricultural lands can continue to feed the region. Politicized land reform, as in Zimbabwe, disenfranchises white farmers without transferring commercial technologies, setting a dangerous precedent that risks the loss of both political and food sovereignty at regional and national levels.

It must be undertaken in South Africa and Namibia with caution. The agro-industrial complex is an important base of the economy in assuring political autonomy and healthy people. If this sector collapses, it could result in South Africa's and Namibia's economies heading into a tail spin. South Africa's Agricultural Black Economic Empowerment (AgriBEE) document needs to be undertaken in a partnership between government and the private sector to assure

an orderly transition, while maintaining food production for the region. The mentoring program discussed above should play an important role in assuring the transfer of commercial farming technology to the black community. Sub-Saharan Africa cannot afford another Zimbabwe.

As noted above, Africans must be trained to run and operate these lands, even if they are community-owned instead of individually owned. Depending on each agro-ecological zone, minimal farm sizes must be established to assure that both the ecological and economic integrity of these units are maintained.

14.2.1.4 Sustainable use of other natural resources

This assumes that tenure problems over land and resource ownership are resolved.

Linking the concept of food self-sufficiency to food security, as discussed, recognizes that in the majority of Sub-Saharan Africa, its savanna's will never be a breadbasket for the subcontinent due to physical and chemical limitations of the soils and to climate. Where feasible, Africans must take advantage of the best land uses in these savannas from wildlife, forestry, fisheries and pastoralism to generate income that can be used to buy food. Someone must provide training to rural African's to sustainably manage these resources. The same can be said about tropical lowland forests and afromontane forest biomes where logging, bushmeat, wild medicines, fishing, honey, gorilla/primate viewing, backpacking, mountain climbing and safari hunting can generate significant income for rural communities.

Recognition of Traditional Resource Management Systems and Their Integration into Modern “Western” Intensive Management

Unless there is a paradigm shift towards a “utilitarian conservation” that meets the needs of rural Africans whose lives are still closely tied to these resources, neither they, nor wildlife, nor the natural systems on which they both depend have much of a future. Ultimately, this approach will result in high biodiversity through incentives for rural Africans to live sustainably from the multitude of resources available to them in “their” protected areas, as has been the tradition in the past. Thus, the future of Africa’s mega-fauna is in the hands of the rural people co-existing with this wildlife. If the policies are correct, they will become good conservationists as in the past, but if the status quo remains, neither the NGO’s nor game/park departments, nor international bureaucratic controls, such as CITES, will stop wildlife’s demise as rural inhabitants opt for other land uses and/or in a survival mode use wildlife as a short-term resource.

It is recommended here that formal conservation interventions in the 21st century should take advantage of already-existing informal traditional management and control systems to ensure maximum local participation and success.

Furthermore, there is a need for more scientific evaluation of the traditional beliefs, and practices, a better understanding of their role in conservation and resource management, provision for legal backing of these traditional management systems and a need for enforcement of these traditions to ensure continuous biodiversity conservation.

As increasing population pressures require more intensive management of wildlife, where hunting guilds exist, strong consideration should be given to strengthening these institutions, through which all local hunters would be required

to pass in order to receive proper training and to control access to the resource. This may be likened to someone in Europe or North America being required to be part of a hunting club as a means of buying into the right to access certain properties and their wildlife, or as is currently occurring in South Africa, being a member of a hunting or shooting association as a prerequisite to owning a firearm.

Selected youth from these guilds would be hand-picked, sent off for mid-level (e.g., Mweka and Garoua) or tertiary (university) training, returning to work with the guilds to take over and manage game reserves and parks as centers of both biodiversity and economy, something centralized governments have for the most part proven incapable of accomplishing. This process is currently underway in the Comoé-Leraba Game Reserve of southern Burkina Faso. This would apply for traditional forestry, fisheries, pasture and other resource management structures and systems – that is a blend of traditional systems with modern concepts, providing a cultural anchor, “building the churches of conservation on the bases of the traditional pyramids” that was so successful in the adoption of Catholicism introduced by Spain to the Aztecs, Mayans and Incas in the New World.

Community-owned Natural Resource Businesses

The best managers of natural resources are those whose lives depend on the resources for survival, not NGOs or government bureaucrats isolated in capitals or regional towns, nor the private sector, all of whom have tended to live off the wealth of rural communities. There is an increasing need through decentralization to legalize ownership and control over land and resources by communities, while these other stakeholders provide technical backstopping and marketing until communities have developed their own trained members and clientele.

Rural Africans need support in starting their own “community-owned” companies (e.g., photographic safaris, hunting safaris, commercial and sportfishing companies, Scuba diving operations, agricultural companies and transformation industries, logging and timber transformation companies, etc.) that fit within their socio-cultural framework and which assures that the majority of net profits stay within rural Africa, serving as a catalyst for development. Creating transparent external auditing will help overcome the chronic disappearance of funds so common in CBNRM and allow the communities to hold selected decision makers accountable for their actions. A major challenge is getting communally oriented cultures to make shareholder-owned companies work to the benefit of the shareholders as opposed to a few elite!

Where needing Western technologies and marketing skills, communities can joint venture with foreign entities, but being educated as recommended, communities will clearly understand the value of their natural resources and what it will take to sustainably manage them. In the interim, there is a role for NGO watchdogs/advisors to assure equity in such ventures, as long as the NGO's do not make themselves indispensable middlemen. Thus, communities will be able to assure an equitable share of profits and that resources are harvested sustainably so as to be available for future generations. Any such joint venture must include on-the-job and formal training with a goal that the company is locally run and operated over a 15-20 year time frame. Exposure of rural Africans to the overseas market is critical to their learning the business and being able to cut out the middleman.

As much as possible, a management and land use plan should allow for multiple resource use (e.g., safari hunting, traditional hunting, charcoal making, timber harvesting, fishing, honey collection, other wild food collection, thatch grass collection, wild medicines harvesting, etc.) from these natural areas as a means of

maximizing both economic and cultural benefits to community stakeholders/entrepreneurs, as well as to get as many benefits as widely distributed as possible at the household level. The White Mountain Apache program might be looked at as an adaptable model for Sub-Saharan Africa.

These “community-owned companies” can pay taxes like any private sector company. The shareholders of the companies, the heads of households, can also pay taxes if income is distributed at this level. This will negate the felt need by African governments to take the value of these resources directly (e.g., trophy and concession fees), a major reason that rural Africans remain in a perpetual state of poverty on the richest continent in the world. This implies legal title deeds to both land and the resources on this land.

Cultural and Economic Constraints

A caveat and a constraint to progress is that the majority of rural Africans, due to the population explosion and politics, both pre and post-colonial in the 20th century, are at or near the lowest level of Maslow’s Hierarchy of human needs, “survival”, and thus are prepared to do anything in order to move up this pyramid. Westerners, who are at the top of this pyramid, may be expecting too much to hope that individual’s in Africa will care about the greater good of their fellow man or biodiversity when they are trying to survive, while having to drag along the extended family that acts as a ball and chain attached to their ankle, continually pulling them down economically. This trait is strongly linked to the patronage system and clientelism that Westerners perceive as corruption, but which Africans consider taking care of their extended families, ethnic and religious groups to whom they relate and maintain their power base more so than nationhood. This often results in a clash of cultures when the two groups, the West and Africa, try to conduct trade and commerce, or establish Western rule of

law. This problem, which must be overcome, permeates at all levels of society from the capital down to the village level.

Until Sub-Saharan Africa develops a majority middleclass that permits individuals to free themselves of this cultural bondage, the West is naïve to think that the subcontinent will develop a “modern conservation” ethic, or those in control of power, resources or money will be altruistic, regardless of the level of decentralization. Transparent accounting systems can help overcome this problem technically, but only major strides in education and economic development can overcome this constraint. Ultimately, the blame must not be placed entirely on the extended family/ethnic group. A large part of the blame and most of the solution lies in governments creating appropriate policies that result in growing economies, adequate employment and the circulation of wealth through the majority, spawning a consumer society and taking the pressures off individuals to support the massive numbers of unemployed. It is likely that not until the majority of one’s extended family has work opportunities, will this constraint be overcome.

Thus, conservation and development in Sub-Saharan Africa is confronted with major challenges to overcome, the biggest being for Africans to find a way of integrating their cultural values into and overcoming cultural constraints in order to successfully integrate into Western systems and norms of business, governance and resource management. Africans rapidly pick up Western technologies, so this is not really a major constraint, but a question of exposure and opportunity (e.g., formal educational opportunities and on-the-job apprenticeship programs). The West can help overcome technological constraints, while Africa and Africans must overcome the cultural ones.

Development of Long-Term Resource Monitoring Programs to Assure Sustainability

Once land and other natural resources are returned to their rightful owners, rural communities, who are educated in the sustainable management of soils, wildlife, fisheries, timber, etc., in Sub-Saharan Africa with modern-day internet connections can establish collaborative monitoring programs between themselves, universities, governments and the private sector to assure that these natural resources serve as sustainable catalysts for development.

14.2.1.5 Industrialization and transformation in Sub-Saharan Africa

We should not fool ourselves into thinking that these improvements in CBNRM will create a middleclass in Sub-Saharan Africa by themselves due to the low resource/population ratios. In fact, conservation linked to rural development on its own will fail to conserve biodiversity in Sub-Saharan Africa. With a direct relationship between human population growth and habitat/wildlife decline, conservation in the 21st century must fit into a bigger plan for development of the subcontinent if it is to succeed in saving the last great assemblages of Pleistocene mega-fauna and if it is to improve the lives of Africans.

Urbanization and Industrialization

Among other things, to be successful, conservation must be linked to providing alternative livelihoods in urban settings by taking advantage of youth escaping the over-populated and degraded rural areas. This will have a tremendous beneficial impact in alleviating the current population pressures mining rural resources on the subcontinent. Sub-Saharan Africa must go through the same urbanization,

industrialization and information technology (IT) evolution/revolution experienced by Europe and North America in the 20th century, where, for instance, less than 2% of the people in America feed the majority living in urban centers.

In addition to improved education and healthcare systems, this will require transforming Africa's raw products on the continent, such as:

- Wildlife through taxidermy;
- Timber transformed into veneer, furniture and other byproducts;
- Cocoa, coffee tea, etc. processed and packaged into final products;
- Using the comparative advantage of Africa to grow cotton (with fertilizer to avoid nutrient mining of the soils) and other crops, as well as to employ many people to produce end products such as clothes, roasted coffee, winter vegetables, canned fruit and vegetables, cut flowers, etc. for regional and international consumption; and
- Transform minerals such as steel, aluminum, oil, gold, COLTAN, titanium, etc. into end products such as cars, car parts, appliances, computers and microchips.

Currently, South Africa is the only industrialized country on the subcontinent capable of taking advantage of a gradual opening up of trade with the West for manufacturing cars, car parts, arms, clothes, wines and jewelry, all essentially a product of isolation under Apartheid. Product dumping by China, especially clothes, is jeopardizing this advantage in Lesotho and South Africa, among others.

Sub-Saharan Africa must understand that it has the unique resources desired by the West. It must start calling the shots, requiring industrialization and transformation on the continent prior to sale of its products to the West. In

essence, this is already happening to a large degree in South Africa, locally called “beneficiation”, and its expansion must continue.

However, this cannot be at the expense of the worker and environment. Worker safety and minimal wages that help create a “blue collar” middleclass based on local cost of living, is imperative. Since the cost of living or “purchasing parity” is lower in many developing countries, it is likely that lower wages can be paid compared to North America/Europe, that will allow people to live middleclass lifestyles and thus, for private investors to still make a profit compared to their home country. Where this is not the case, but the West is in dire need of the subcontinent’s resources (e.g., COLTAN, tropical wood products, extracts for medicine and hunting trophies), Africa has the upper hand and can negotiate the transformation of these products, wages and environmental controls. Meeting the same water quality and air standards as in Europe and North America, in both the working and natural environment, are also mandatory. This includes using technologies appropriately (e.g., dams, power plants, municipal and industrial waste treatment and disposal, etc.), including mitigation of adverse environmental and socio-economic impacts as part of the cost for investment and/or the recurring costs of doing business. This will require careful planning and possibly decentralized industrialization that avoids the creation of mega-cities so that no one area’s resources are overly stressed, such as water, air, transport infrastructure, health and educational services.

Going Local Where Necessary

It is not economically viable for every country on the subcontinent to manufacture all of the products it needs, such as automobiles, or to produce all of its transformed foods. As a means of overcoming economies of scale, attempts must be made to develop not only international markets, but regional markets for

manufactured products, such as through the regional organizations of the Southern African Community (SADC), the Southern African Customs Union (SACU) comprised of South Africa, Lesotho, Swaziland, Namibia and Botswana, the Common Market of Eastern and Southern African States (COMESA), the East African Common Market and the Economic Community of West African States (ECOWAS). SADC countries are in the process of agreeing to allow the free flow of goods and workers across borders. This is a move in the right direction in promoting regional trade.

Just as in the USA and Europe, there may be certain local industries, which are labor intensive that need protection at least until they are competitive. Similar to the EU and U.S. for the year 1998, South Africa highly subsidized certain agricultural commodities as a means of maintaining its food production, including wheat with a percentage Producer Subsidy Equivalent/Producer Support Estimate (PSE)/(%PSE) of 19.44, sugar/39.55, mutton/49.28, wool/14.97, dairy/20.92, as well as beef and veal/21.20, indicating the direct and indirect level of support to farmers. Based on a 1996 census, 814,000 people were employed in South Africa's agriculture/hunting/forestry/fishing sector, out of an estimated national workforce of 9.1 million, or approximately 9% of South Africa's workforce. Keeping this important sector viable may require further protection, such as tariffs on imported products as maize that can be sold at artificially low prices to South Africa as a result of subsidies in the U.S. and/or other direct subsidies (e.g., fertilizers and pesticides) to these farmers, as in America and Europe, to help them compete with an unfair market. The rest of Sub-Saharan Africa must follow in South Africa's footsteps.

Local does not mean walling off the outside world. It means nurturing businesses that use local resources sustainably, that employ local workers at decent wages and that serve primarily local/regional consumers. It means becoming more self-

sufficient and less dependent on imports. The EU and America already practice this so why not Sub-Saharan Africa not. Once globally competitive, such as South Africa's car parts industry, markets can be opened to help them expand as part of trade agreements. This helped spawn the "Asian Miracle", along with technologies obtained from foreign investment (FDI).

Appropriate Use of Western Technologies and Environmental Assessment Procedures

South Africa is the only country in Sub-Saharan Africa, which has very serious environmental assessment procedures that are required prior to allowing major development activities. African governments must adopt standardized procedures and must attempt to assure that the placement of technologies, such as boreholes, dams and irrigation systems, do more good than harm and that rural communities benefit from their placement, including receiving appropriate training to be able to benefit from these technologies. Standardized procedures and norms on the subcontinent will prevent foreign investors attempting to force a country to drop its standards by threatening investment in a neighboring country with lower standards. This levels the playing field.

The Sahelian Wetlands Expert Group (SAWEG), linked to the IUCN, can help provide expertise to assure that artificial flooding becomes part of dam management in order to assure that these important wetlands are maintained once hydrological regimes are modified by dams.

Small farmers need training in use of appropriate irrigation technologies, drainage systems, possibly locally produced and cost-effective fertilizers, soil treatment and soil testing for parameters such as acidity, nutrients, salinization, etc. to

assure sustainable agricultural production and to prevent adverse environmental impacts.

Pastoralist communities must be trained to open and close boreholes as a means of controlling livestock and wildlife movements in order to assure that pasture production is maintained as a means of avoiding the ravages of desertification.

With regard to coastal development, especially along Africa's east coast in the Western Indian Ocean, key coral reefs need to be identified and classified as to their current health, such as through the Coral Reef Degradation in the Indian Ocean (CORDIO) program. More importantly, coastal tourism developers should be required to undertake environmental assessments that look at appropriate sewage and solid waste disposal programs, and that assure critical habitat such as mangroves, grassbeds, turtle nesting beaches and corals reefs are minimally impacted by development activities. This will require a land use plan for the area and investors pooling their money to pay construction and maintenance for "Common Property" sewage and solid waste treatment and disposal systems, since it is likely that no one developer can afford the required processes. Where the littoral zone is narrow and/or offshore currents are appropriate, "the solution to pollution is dilution." With appropriate modeling and oceanographic studies; once bed nights reach a certain threshold, preliminary treatment combined with an offshore and/or deepwater outfall will likely be the most cost-effective long-term means of protecting near-shore environments from sewage for both ecological and public health.

Initially, in the early years, until development surpasses the carrying capacity of the system to absorb the pollution without degrading, especially the fragile coral reefs, lower cost technologies may initially be employed (septic systems, secondary package plants – ideally with landbased effluent disposal).

Environmental monitoring, especially of water quality and reef health (e.g., percent algal cover, percent live/dead coral) will be required so that adequate time can be anticipated after a certain level of tourism development (e.g., indicated by increased nutrient levels, algal/coral ratios, and/or percentage of dead coral), where after, high cost technologies will be necessary to maintain the integrity of the coastal ecosystem. Regardless, as a cost of doing business, developers should be required to establish long-term coral reef and water quality monitoring stations as a means of assuring that mitigative action, if necessary, can be taken before irreversible adverse impacts occur from tourism. Such procedures need to be adopted by NEPAD's "Regional Project on Shoreline Protection through Integrated Coastal Area Management".

14.2.2 Policy Changes and Programs by the West to Support Conservation and Development in Sub-Saharan Africa

Capitalism has been based on maximizing profits at all costs, creating win-lose relationships with the rest of the world. Until now, unfettered Western Capitalism, other than for a few Western countries (e.g., America and Europe), has failed the developing world every bit as badly as communism. The New Partnership for Africa's Development (NEPAD) asks both Western governments and their private sector, in return for appropriate policies and good governance, to turn from exploitation for short-term gains to investment in a win-win relationship that in a global society will give African's and their natural resources, especially their unique mega-fauna, a hope for the future.

14.2.2.1 Helping Sub-Saharan Africa industrialize

There is a crying need for the West to export its industrial and IT technologies to the remainder of Sub-Saharan Africa, along with training Africans to work in

these industries so that the rest of the subcontinent can take advantage of the West increasingly opening up to trade in transformed products from Africa.

This will require a win-win relationship with the West in which they introduce their technologies through the Western private sector to help Africa industrialize in carefully selected urban centers that can take advantage of the regional populace without placing undue pressure on local resources such as water, forests and wildlife. This will require careful planning at all levels.

Foreign aid might be of value by providing grants or low interest loans for the Western private sector to invest in various African countries, possibly through a “Sub-Saharan Africa Marshall Plan”. However, the money for this plan must be spent in Africa on infrastructure and on Africans, especially health and education, and not just recycled to Western consulting firms, experts and NGOs, as in the past.

The following agreements can help open up transformation of Africa’s raw products in Africa and their trade with the West: 1) The New Partnership for Africa’s Development (NEPAD), 2) The African Growth and Opportunity Act (AGOA) and 3) The European Union (EU)’s (“Everything but Arms (EBA)”) initiative of duty-free and quota-free entry for all products (except arms) in favor of Least/Less Developed Countries (LDCs), 34 of which are African countries. Sub-Saharan Africa must still compete against various subsidies that protect American and European farmers against outside competition, and product dumping by China that threatens economies in both the developing and developed world. Regardless of trade agreements, good governance, transparent investment incentives (e.g., open currency exchange and reasonable employment laws that protect the employer as much as the employee), a free press, and assuring appropriate democratic processes and civil stability will be required for Sub-Saharan Africa to receive significant Foreign Direct Investment (FDI).

Some might ask if it is in the economic interest of the West to help transform products that would otherwise stimulate their and not Sub-Saharan Africa's economies. Much of the burden of bringing industrialization and IT to the rest of the subcontinent may fall on the shoulders of South Africa. In addition to altruistic motives, this may also be necessary in order to avoid the rest of Sub-Saharan Africa seeking shelter on South Africa's door step, as is currently the case, with all of the concomitant ramifications such as crime and pressure on health, educational, housing, roads and other services. At this time, South Africa must make sure that it does not become another imperial/colonial power exploiting cheap labor and negligible environmental controls as it introduces these technologies to the rest of the subcontinent.

14.2.2.2 Dropping trade barriers and subsidies

The West cannot be allowed to put up "smoke and mirrors" in which "markets are opened", but tariffs and other trade barriers, subsidies, artificially weakened currencies and other constraints keep them closed and non-competitive. Dumping subsidized food and other products in Africa, often of inferior quality (e.g., maize with a high moisture content with the risk of aflatoxins developing) and other Western approaches (e.g., neoliberal structural adjustment policies of the Washington Consensus) that keep Africa marginalized, must be halted. The World Trade Organization (WTO) may serve as the negotiating body for this process. The African Union and regional Sub-Saharan organizations should play a major role in negotiating these regulations and controls. There must be equality on the playing field of trade and commerce; two-way fair-trade, not one-way unfair "free" trade.

14.2.2.3 "Publish what you pay", creating transparency with what happens to Africa's wealth

Launched in 2002, "The Publish What You Pay" coalition of more than 190 Northern and Southern NGOs is calling for legislation to require extractive

companies to disclose their payments to all governments. This would help citizens in resource-rich-but-poor countries, as well as the global community, to hold African governments accountable over the management of revenues. Some say stock market regulators could require such disclosure by Western oil, gas and mining companies in order to be listed on the stock exchange and financial markets. This could potentially occur through the World Trade Organization (WTO) or the United Nations (UN). Some may perceive this recommendation as patronizing and condescending to Africans and African governments. However, if we are open and honest, until there is a majority educated African middleclass demanding the creation of transparent and accountable systems in the business place and in governments, as well as rule of law to overcome the above-mentioned cultural constraints, it is the responsibility of a global community in this modern age of information and communication to hold both multi-national and national corporate leaders and governments accountable for reinvesting the wealth of Sub-Saharan Africa back into its people and infrastructure. As this income is invested in the health and education of Africans, citizens of these countries will demand this same transparency and accountability from their leaders and such programs can fall away.

Decentralizing resource and land tenure to the local level should bring accountability down to the local level, but will still require establishment of transparent accounting systems and democratic decision making processes that fit into the socio-cultural framework at the local level. Once again, installation of accounting systems is a simple technological process, while implementation of this technology and using it in a functional transparent system is confronted with cultural constraints (e.g., a government appointed non-representative chief and a few cronies feeling they have the right to use economic benefits as they wish without asking permission of their constituency) or possible cultural strengths requiring traditional democratic meetings such as “indaba” in the Zulu culture or

“kgotla” of the Tswana culture. Once again, Africans must integrate their traditional systems of governance and culture with these modern decision-making tools and make them part of the solution as opposed to part of the problem.

14.2.2.4 Areas where foreign aid can make a difference in Sub-Saharan Africa – health and education

Education and health (e.g., HIV/AIDS, potable water supplies, etc.) are two priority areas where an increase in aid is desperately needed and could make an enormous difference to the lives of millions of people in Africa. Africa’s education crisis is stunting its development. Education has the potential to be a “stealth weapon” in the war against poverty. It can open doors to better health, increased income and independence. Investment in education and health will result in declining birth rates and declining rates of HIV/AIDS. It will produce productive adults able to fit into a global economy as envisioned by NEPAD. Education and the creation of a middleclass, along with urbanization, will help rid ethnic hatred often derived from competing for scarce resources, while retaining cultural pride, as well as breakdown the suffocating aspects of the extended family, while retaining the positive moral and cultural beliefs, and kin ties. It will help bring about democracy, as awareness through education will demand accountability from leaders. The only other real need is food relief, until the subcontinent combines food self-sufficiency that is improved food production in Sub-Saharan Africa, with food security that is through industrialization/IT employing people who can buy their food, either locally produced or imported. Food relief must only be used in emergency situations and not become a “crutch” that allows the subcontinent to put off the inevitable, the need to stand on its own two feet, or a mechanism that discourages farmers from farming.

14.3 ROLE OF WATCHDOG NGOS

Human rights groups, (e.g., Forest Monitor, International Crisis Group (ICG), Human Rights Watch, International Rivers Network (IRN), OXFAM, Survival International, World Rainforest Movement, etc.) must continue monitoring people displaced by large dams, either within inundation zones or from modification of downstream floodplain ecosystems; to traditional fishing communities impacted by coastal development and people adversely impacted from the continual creation of parks and protected areas that fail to truly integrate peripheral communities into their management and the sustainable use of the resources found within them.

Watchdog groups such as the International Rivers Network (IRN) and the World Commission on Dams (WCD) – now housed at UNEP/Nairobi - must keep countries, donors and the private sector honest, assuring that mitigative actions recommended by environmental assessments are implemented and that alternatives to large dams (e.g., alternative energy, small-scale hydropower, run-of-the-river hydropower, min-barrages and micro-irrigation) are seriously considered.

Coastal watchdogs, such as Global Coral Reef Alliance and Reefbase, need to speak out when unsustainable development is undertaken that may degrade these fragile systems.

Groups such as the Forest Stewardship Council (FSC) and their forest certification *Société General de Surveillance* (SGS) QUALIFOR program need to move into Central Africa to assure the logging of Africa's tropical lowland forests, mostly by European companies, is sustainable from the standpoint of timber harvests, associated wildlife and local cultures. They need to be teamed up

with human rights groups that help to assure what is happening within these forests, in what appears to be possible collusion between international timber companies, some conservation NGOs, western donors and governments, is not destroying the lives of traditional societies.

If necessary, consideration must be given to charging key stakeholders with human rights violations where the future of rural small-scale societies may be in jeopardy because of inappropriate conservation and exploitation schemes. The bottom line cannot just be maximization of profits when biodiversity and the lives of people are concerned.

14.4 CONCLUDING REMARKS

The Pulitzer Prize-winning author and professor of geography at the University of California, Los Angeles, (UCLA), Jared Diamond, contends that the collapse of past civilizations (e.g., Anastazi of Arizona; Mayan of Guatemala and Mexico, etc.) are linked to eight areas that resulted in major environmental degradation and eventually their collapse (Diamond, 2005) including: deforestation and habitat degradation, soil problems (erosion, salinization and soil fertility losses), water management problems, over-hunting, over-fishing, effects of introduced species on native species, human population growth and increased per capita impact of people.

In the 21st century, Diamond (2005) adds an additional four environmental problems jeopardizing modern civilization: human/natural-caused climate change (e.g., e.g. desertification, mass coral mortality from ocean warming, loss of wildlife habitat), build-up of toxic chemicals, energy shortages and full utilization of the Earth's photosynthetic capacity.

However, a society has never collapsed solely from environmental damage. Environmental damage and three additional factors are identified that may significantly contribute to a civilization's collapse (Diamond, 2005): hostile neighbors, friendly/unfriendly trade partners and society's response to its environmental problems;

Diamond (2005) raises concern that with globalization, modern businesses are among the most environmentally destructive forces of the 21st century, but at the same time makes it impossible for a society to collapse in isolation, since such events can be viewed on CNN or BBC news broadcasts. The danger is raised that any society in turmoil today, no matter how remote, can cause trouble for prosperous societies on other continents (e.g., cutting off supplies of oil in the Niger Delta or other resources/products necessary to maintain Western economies, and generating terrorists out of hopelessness and despair from youth living in rogue nations or countries with non-representative dysfunctional governments). Diamond (2005) alleges that for the first time in the history of mankind, we face a risk of global decline.

This book demonstrates that Sub-Saharan Africa is faced with the majority of the above environmental issues/indices, including over-population, soil exhaustion, deforestation, desertification, over-fishing, over-hunting, major loss of habitat and biodiversity, water scarcity and the possibility of water wars, along with related factors:

- Declining or no agricultural fallow;
- Declining agricultural yields (kg/ha) and/or maintained short-term yields through intensification and mining of soils or extensification into marginal areas;
- Declining land per capita available for agriculture;

- Wars fought over land/resource scarcity (e.g., Rwanda, Burundi, the Ivory Coast; central Nigeria; Darfur, Sudan) - friction resulting from small farmers encroaching in traditional pastoral environments;
- Hard-edged pockets of biodiversity (parks and hunting blocks, private commercial ranches) surrounded by a sea of poverty and slowly being encroached upon;
- Western solutions to conservation that continue compressing Africans onto unsustainable land masses in the name of biodiversity, accelerating rather than ameliorating environmental degradation; resulting in degradation first in the compressed areas and next through invasion of so-called protected areas by alienated rural communities;
- Linked to the above point, hunting concessions and ecotourism concessions being leased out at a pittance to foreigners/outsiders, often making access to these areas either unaffordable and/or illegal for Africans to frequent, with much of the income derived mostly from foreign clients staying in the capital or offshore in overseas bank accounts;
- Hostile neighbors, resulting in Sub-Saharan Africa's first "World War" in the Congo Basin over access to abundant resources;
- Massive immigration by Sub-Saharan Africans across borders to escape this environmental degradation to coastal African cities and centers of wealth, such as South Africa, Europe and the USA; and
- Unfriendly trade relationships as Western powers take on the behavior of a predator, hungry for scarcer global resources (e.g., oil and COLTAN) they need for survival; regardless of the consequences to the countries and people living among these resources;
 - Non-representative governments – often put into power and propped-up by the West to meet the needs of the West and to the benefit of a few multi-nationals and political elite;

- Foreign aid and trade regulations from supposedly friendly partners who use these as tools to continue plundering Sub-Saharan Africa's raw resources; and
- Proxy wars using African troops by Western super powers for ideological reasons and/or control over Africa's riches to the detriment of millions of people.

This book concludes that if Sub-Saharan Africa fails to address these human dimensions of conservation and development, and continues along present trends in 50 years time, if not sooner, we could be talking not about the collapse of a civilization, but of an entire subcontinent.

Africa and Africans must begin taking control over their resources, their lives and their destinies, which since colonial days up until present, are controlled by outside forces that have placed their vested interests, and not Africa's, as a priority. Africa and Africans must jettison the shackles of economic, political and psychological slavery, from both within its borders and from outside. Will Africa "choose to fail or succeed"? Will the sun rise or set over this ecologically and culturally unique and resource rich continent? Africans must make this decision and the rest of the world will follow them. Currently, Africa is following.

Finally, concerning the future of modern man, there is an interesting comparison to be made between Western civilization's conspicuous consumption, and the beaver (*Castor canadensis*). The beaver's teeth never stop growing. It must continually chew down trees to grind back its incisors so that they do not keep the mouth from closing and the beaver starving to death. When beavers overpopulate an area, their ability to expand, as a population is dependent upon available habitat at a local level, often placing their populations into boom or bust cycles. Western civilizations' economies and now that of China, as they run low on food

(e.g., oil and other resources) expand their consumption to other continents (e.g., Sub-Saharan Africa). While beavers have no choice, chewing to live, Western civilization should have the foresight to realize the unsustainability of its actions (Stouder, 2007) and the risk to our Planet if this continues.

CONCLUDING REMARKS

Diamond, J. 2005. Collapse. How societies choose to fail or succeed. Viking Penguin: New York. 575p.

Stouder, S. 2007. The ethics of beavers and the future of humans. Izaak Walton League of America's Sustainability Education Program News, Gaithersburg Maryland, www.iwla.org. Sustainability Communicator, 10(2), Summer

ACRONYMS

911	September 11, 2001, World Trade Center Plane Crashes
AA	Authorized Associations, Tanzania
AAAS	American Association for the Advancement of Science
AAB	African Advisory Board
AAITP	Asia-Africa Investment and Technology Promotion Centre
ABB	ABB Ltd, involved in power and automation technologies, Zurich, Switzerland
ACHPR	African Commission on Human and Peoples' Rights
ACOPS	Advisory Committee on Protection of the Sea, United Kingdom
ACOTA	Africa Contingency Operations Training Assistance
ACP	Cotonou Agreement for “African Caribbean and Pacific”
ACRI	African Crisis Response Initiative
ACSS	African Center for Security Studies
ACT	Artemisinin-Based Combination Therapy, Malaria treatment
A.D.	<i>Anno Domini</i> , “Year of the Lord”
ADB	African Development Bank
ADC	Area Development Committees, Zambia
AECA	African Elephant Conservation Act
AEF	<i>Afrique Équatoriale Francaise</i> (French Equatorial Africa)
ADF	Allied Democratic Front/Force, Sudanese backed Ugandan Islamic fundamentalist and virulently anti-Christian group based in the Rwenzori Mountains
ADF	African Development Fund
ADMADE	Administrative Management Design for Game Management Areas
ADFL	Alliance of Democratic Forces for the Liberation of Congo = AFDL in French
ADT	<u>Association Darkois du Tir</u>
AECA	African Elephant Conservation Act of the United States

AEF	French Equatorial Africa/ <i>Afrique Équatoriale Francaise</i>
AFRC	Armed Forces Revolutionary Council
AFDL/ADFL	<i>Alliance des Forces democratique pour la liberation du Congo/Alliance of Democratic Forces for the Liberation of Congo</i>
AfESG	IUCN/SSC's African Elephant Specialist Group
AFLEG	African Forest law Enforcement and Governance Process
AFRC/RUF	Armed Forces Revolutionary Council junta of Major Johnny Paul Koroma /Revolutionary United Front rebels, Sierra Leone
AFRICARE	Development NGO
AFRICOM	U.S. military command for Africa
AGOA	Africa Growth and Opportunity Act
AGEREF	<i>Association Intervillageoise de Gestion des Resources Naturelles et de la Faune, Burkina Faso</i>
AgriBEE	Agricultural Black Economic Empowerment Program of South Africa
AGRRA	Atlantic and Gulf Rapid Reef Assessment
AGU	American Geophysical Union
AHT	<i>Agrar-und Hydrotechnik GMBH</i> , German Consulting Firm
AID	Agency for International Development = USAID
AIMS	Australian Institute of Marine Science
ALWG	African Lion Working Group
AMF	American Mineral Fields
AMS	Aggregate Measure of Support ≈ Amber Box, international trade/subsidies
AMS	American Meteorological Society
ANON	Anonymous
ANC	African National Congress of South Africa
AOO	Area of Occupancy EOO = Extent of Occurrence
AOPIG	African Oil Policy Initiative Group
APA	Alkaline Phosphatase Activity

APHA	American Public Health Association
ARC	Agricultural Research Council of South Africa
ARLMP	Arid Lands Management Project, Turkana, Kenya
ART	African Resources Trust
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASL	Average Sea Level
AU	African Union
AWF	African Wildlife Foundation
AWHC	Available Water Holding Capacities
BAD	<i>Banque Africaine De Développement</i>
BBC	British Broadcasting Corporation
BC	Before Christ
Bcm	billion cubic meters
BCTF	Bushmeat Crisis Task Force
BECA	US-Mexico Border Environmental Cooperation Agreement
BECC	Border Environmental Cooperation Commission
BIA	Bureau of Indian Affairs, USA
BINGOS	Big conservation NGOs such as World Wildlife Fund (WWF), Wildlife Conservation Society (WCS), Conservation International (CI), The Nature Conservancy
BIP	<i>Produit Interieur Brut</i> = Gross Domestic Product GDP
BMC	Botswana Meat Commission
BMW	<i>Bayrische Motoren Werke</i> , Bavarian Engine Manufacturing
BNA	Bureau of National Affairs
BOD	Biological Oxygen Demand
BOP	Balance of Payments
BP	Before Present, "Years Ago"

BP	British Petroleum
Bpd	Barrels per day, also seen as bbl/d and b/d
BSAC	British South African Company
BSAC	British Sub-Aqua Club
Bt	<i>Bacillus thuringiensis</i>
BWG	Bushmeat Working Group, CITES
BWMA	Botswana Wildlife Management Association
C	Centigrade
ca.	circa or about a given time
CAADP	Comprehensive Africa Agriculture Development Program, a NEPAD/FAO Initiative
CaCO ₃	Calcium Carbonate
CAES	Central Africa Elephant Strategy
CAMPFIRE	Communal Areas' Management Program for Indigenous Resources
CAN	National Water Commission
CAP	Common Agricultural Policy
CAR	Central African Republic = RCA in French
CARE	Food Relief and Development NGO
CARPE	Central African Regional Program for the Environment
CATIC	China National Aero-Technology Import and Export Corp of China
CBFP	Congo Basin Forest Partnership
CBNRM	Community Based Natural Resource Management
CBC	Community-Based Conservation
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CBO	Congressional Budget Office
CC	Community Conservation

CCWA	Caribbean Water and Wastewater Association
CDV	Canine Distemper Virus
CE	Christian Era
CEC	Commission for Environmental Cooperation, North America
CEDC	<i>Centre Des Etudes de L'Environnement et de Développement du Cameroun</i> , the Center for Environmental and Development Studies in Cameroon, Maroua, Cameroon
CEDEAO	<i>Communaute Economique des Etats d'Afrique de l'Ouest</i> – ECOWAS in English
CEEC	Central and Eastern European Countries
CEGs	Community Escort Guides
CEII	Citizens Energy International, Inc.
CEO	Chief Executive Officer
CFA	<i>Franc de la Communauté Financière Africaine</i> , Francophone Africa Currency = FCFA, at time 50 CFA/1 French Franc (FF) until 1994 when it was devalued at 100 CFA/1 French Franc, now fixed to the EURO at 655.957 FCFA/1 EURO
CFAO	<i>Compagnie Francaise de L'Afrique de l'Ouest</i>
CFCs	Chlorofluorocarbons including CFC-12 (CCl_2F_2) and CFC-11 (CCl_3F)
CFSO	<i>Compagnie Forestière de la Sangha-Oubangui</i>
CGIAR	Consultative Group on International Agricultural Research
CH ₄	Methane
CHA	Controlled Hunting Area
CI	Conservation International
CIA	Central Intelligence Agency of the United States
CIAT	<i>Centro International de Agricultura Tropical</i> /International Centre Tropical Agriculture
CIB	<i>Congolaise Industrielle des Bois</i>
CIDA	Canadian International Development Agency
CILSS	Permanent Interstate Committee for Drought Reduction in the Sahel
CJTF	Combined Joint Task Force-Horn of Africa

CIRAD	<i>Centre de Cooperation Internationale En Recherche Agronomique et Developpement</i> , old ORSTOM
CITES	Convention on International Trade in Endangered Species
CKGR	Central Kalahari Game Reserve
CM	Collaborative (or Co-) Management
cm	centimeter
CMA	Community Management Area (Botswana)
CN	Cyanide
CNDP	National Congress for the Defense of the People CNDP
CNN	Cable News Network, a television and news web broadcasting company, a Time Warner Company
CNPC	China National Petroleum Company
CO ₂	Carbon Dioxide
COBRA	Conservation of Biosphere Reserve Areas, Kenya Wildlife Service, USAID Funded
COLTAN	Columbite-Tantalite, used in making microchips, cell phones and computers
COMESA	Common Market for East and Southern Africa
COMIEX	DRC Mining Company
COMINFAC	Conference of Minister in Charge of Forestry in Central Africa
COP	Conference of Parties, CITES
CORAF	<i>Conseil Ouest et Centre Africain pour la Recherche et Développement</i> = WECARD in English
CORDIO	Coral Reef Degradation in the Indian Ocean
CORE	Conservation of Resources through Enterprise, sequel to COBRA Kenya Wildlife Service, USAID funded
COSLEG	Mining company in DRC linked to Zimbabwe Defense Forces
<i>Cote d'Ivoire</i>	Ivory Coast
COVAREF	<i>Comité de Valorization des Resources Fauniques</i> (Committee for Valorization of Natural Resources - Cameroon)

CPA	Communal Property Association, South Africa
CPA	Comprehensive Peace Agreement between northern and southern Sudan
CPI	Community Protected Area Institution
CPI	Corruption Perceptions Index
CPR	Common Property Resource
CRBs	Community Resource Boards
CRODT	<i>Centre de Recherche Oceanographique Dakar/Tiaroye</i>
CRS	Catholic Relief Service
CRTF	United States Coral Reef Task Force
CSS	<i>Compagnie Sucriere Senegalaise</i>
CTE	<i>Controle Technique de L'Etat</i> , Burkina Faso
CUE	Catch Per Unit of Effort
CVGTs	<i>Comité Villageois de Gestion des Terroirs</i>
CWM	Community Wildlife Management
DAC	Development Assistance Committee of the OECD (Organization For Economic Cooperation and Development)
DBH	Diameter Breast Height = (Diametre a Hauteur de Poitrine – DHP)
DBS	<i>Deutsche Bertungsgesellschaft Fur SalinenTechnik</i> , German Consulting Firm, Katwe Salt Works, Uganda
DEAT	Department of Environmental Affairs and Tourism, South Africa
Debswana	De Beers Botswana + Botswana Government
DEF	<i>Direction des Eaux et Forets</i> , Madagascar
DFID	Department for International Development, Great Britain, previously ODA
DFLR:	Democratic Front for the Liberation of Rwanda/Front démocratique pour la libération de Rwanda (FDLR)
DHP	Diametre a Hauteur de Poitrine = DBH, Diameter Breast Height
DGSE	<i>Direction Générale de la Sécurité Extérieure</i>
DHV	Dwars, Heederik en Verhey, Dutch Consulting Firm

DIA	Defense Intelligence Agency, USA
DIN	Dissolved Inorganic Nitrogen = Dissolved (Filterable) [Nitrate (NO_3) + Ammonia]
DME	<i>Diamètre Minimum d'Exploitabilité</i> = Minimal Logging diameter (MLD)
DNA	Deoxyribonucleic Acid
DNFFB	National Forestry and Wildlife Directorate, Mozambique
DOHA	Doha, Qatar where forth World Trade Organization (WTO) talks were held, November 9-13, 2001
DOJ	Department of Justice, USA
DP	Democratic Party
DPOM	<i>Direction de Peche et Oceanographie Maritime, Senegal</i>
DRC	Democratic Republic of Congo, old Zaire
DMA	Division of Management Authority, U.S. Fish and Wildlife Service = OSA
DSA	Division of Scientific Authority, U.S. Fish and Wildlife Service = OMA
DSO	Distinguished Service Order (DSO): a military decoration of the United Kingdom & formerly of other Commonwealth countries, for meritorious or distinguished service by officers of the armed forces during wartime, typically in actual combat
DSS	Decision Support System for organic matter management in soils
DST	<i>Direction la Surveillance du Territoire</i>
DSU	Dispute Settlement Understanding under the World Trade Organization (WTO)
DU	Ducks Unlimited
DWNP	Department of Wildlife and National Parks
DNPWM	Department of National Parks and Wildlife Management, Zimbabwe
EA	Environmental Assessment = EIA
EAWS	East African Wild Life Society
EBA	Everything But Arms, European Union Trade Agreement
EC	European Commission
ECA	UN Economic Commission for Africa

ECOFAC	<i>Programme De Conservation Et Utilisation Des Ecosystèmes Forestiers En Afrique Centrale</i> (ECOFAC)/Program for Conservation and Utilization of Forest Ecosystems in Central Africa
EITI	Extractive Industries Transparency Initiative
EO	Executive Outcomes, private military contractor
EOO	Extent of Occurrence
EUCOM	European Command, U.S. Department of Defense
ECOMOG	Economic Community of West African States Monitoring Group
ECOWAS	Economic Community of West Africa States = CEDEAO in French
ECU	European Currency Unit
EDF	European Development Fund
EIA	Energy Information Administration of the U.S. Department of Energy
EIA	Environmental Impact Assessment = EA
EIA	Environmental Investigation Agency
EIR	Extractive Resources Review
EIS	Environmental Impact Statement
EITI	Extractive Industries Transparency Initiative
EMSL	Environmental Support Laboratory
EPZ	Export Processing Zone
ESKOM	South African electrical company
ESA	Endangered Species Act of the United States
ESAF	Enhanced Structural Adjustment Facility of the International Monetary Fund (IMF)
ESAP	Economic Structural Adjustment Program ≈ Structural Adjustment Program
EU	European Union
EUCOM	European Command of U.S. Department of Defense
F	Fahrenheit
FAC	<i>Fonds d'Aide et de Cooperation</i> , French Fund for Assistance and Cooperation

F _x	F ₁ , F ₂ , etc. Genetic Generations
FAO	Food and Agricultural Organization of the United Nations
FAPC	<i>Forces Armées du Peuple Congolais/</i> People's Armed Forces of Congo in Ituri Forest of the DRC supported by Uganda
FAR	<i>Forces Armées Rwandaises/Rwandese Armed Forces/RAF - Hutu</i>
FAZ	<i>Forces Armées Zaïroises/Zaire Armed Forces</i>
FARA	Forum for Agricultural Research in Africa
FCFA	<i>Franc de la Communauté Africaine</i> , Francophone Africa Currency = CFA – See For Fixed Rates against EURO
FDD	<i>Forces de Defense de la Démocratie /Forces for the Defense of Democracy,</i> Hutu rebel group, Burundi
FDI	Foreign Direct Investment
Fe	Iron
FESP	Forest/Environment Sectoral Program
FFP	Food for Peace
FEWS	Famine Early Warning System
FIDES	<i>Fonds d'Investissements pour le Développement Economique et Social,</i> beginning of French Foreign aid
FIFABE	<i>Fikambanana Fampanddrosoana ny Lemak'I Betsiboka</i> – state run organization controlling impoundments and rice culture in Faritany (Province) of Mahajanga, Madagascar
FLC	<i>Front de Libération du Congo</i> , rebel group northern DRC
FLEC	Front for the Liberation of the Cabinda Enclave – <i>Frente de Libertacao do Enclaave de Cabindauanda</i>
FKNMS	Florida Keys National Marine Sanctuary
FMG	<i>Franc Malagasy</i> , Malagasy Franc – Currency of Madagascar
FNAWS	Foundation for North American Wild Sheep
FMG	Malagasy Franc
FNI	<i>Front des Nationalistes et Intégrationnistes</i> , Lendu ethnic group serving as proxy army in the DRC for Uganda after Uganda pulled out of DRC in 2003

FNLA	<i>Frente Nacional para a Libertaçāo de Angola</i> /National Front for the Liberation of Angola
F.O.B.	Free on Board
FONP/CF	Policy and Institutions Branch of the Forestry Dept./Community Forestry OF THE Forestry Policy and Policy Division of the Forestry Dept., Food and Agricultural Organization (FAO) of the United Nations (UN)
FOREX	Foreign Exchange
FPIF	International Foreign Policy in Focus
FRDC	<i>Front de Résistance pour la Défense du Congo</i>
FRELIMO	<i>Frente de Libertacāo de Moçambique</i>
FRPI	Patriotic Force of Resistance in Ituri (<i>Force de Résistance Patriotique d'Ituri</i>), made up of ethnic Ngiti (Lendu from the south) who operate in areas south of Bunia
FSC	Forest Stewardship Council
FTA	Free-Trade Area/Agreements
FTAA	Free Trade Area of the Americas, expansion of NAFTA
FUC	Front Uni pour le Changement, rebel group trying to overthrow Idriss Déby of Chad
FY	Fiscal Year, runs from October 1 st of previous calendar year and ends on September 30 th of the year for which it is numbered
G7	Major industrial democracies of France, United States, Britain, Germany, Japan, Italy and Canada
G8	G7 + Russia
G20	Developing Countries led by India and Brazil
GAs	Grazing Associations
GAEZ	Global Agro-Ecological Zones
GAIN	Global Agricultural Information Network, of the U.S. Department of Agriculture
GAO	U.S. Government Accountability Office, old: U.S. General Accounting Office
GATT	General Agreement on Tariffs and Trade
GCA	Game Control Area or Game Controlled Area
GCM	General Circulation Model for climate change

GCMRN	Global Coral Reef Monitoring Network
GDF	Global Development Finance
GDP	Gross Domestic Product – BIP, <i>Produit Interieur Brut</i>
GEF	Global Environmental Facility administered by the implementing agencies of the World Bank, UNEP and UNDP
GEPRENAF	<i>Projet de Gestion Participative des Ressources Naturelles et de la Faune</i>
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection of the United Nations
GFAR	Global Forum for Agricultural Research
GFCC	Gannett Fleming Corddry and Carpenter
GGF	<i>Groupements de Gestion Forestiere</i> , Forestry Management Groups
GHG	Greenhouse Gas
GIS	Geographic Information System
GLASOD	Global Assessment of Soil Degradation
GM	Genetically Modified
GM	General Motors
GMC	Genetically Modified Crop
GMA	Game Management Areas
GMO	Genetically Modified Organism
GNI	Gross National Income = GNP
GNP	Gross National Product = (GDP + NFP) = GNI = Gross National Income
GNP	Garamba National Park
GPA	Global Program of Action for marine pollution
gpd	Gallons per day
GRB	Gambia River Basin
GRN	Namibian Government
GSP	Generalized System of Preferences

GT	<i>Gestion De Terroir</i> – Community Management Of A Territory, Francophone Africa
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Collaboration), German Donor Agency
GWh	Gigawatt hours One Gwh equals 1 million Kwh
Ha	Hectares
HARZA	American Engineering Company, known for dam building
H ₂ CO ₃	Carbonic Acid
HDI	Human Development Index
HEW	U.S. Department of Health, Education and Welfare. Today, U.S. Department of Health and Human Services
HICs	High-Income Countries
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HIPC	Heavily Indebted Poor Countries
H ₂ O	Water, water vapor
HUI	Herbivore Use Intensity
HYVs	High-Yielding Varieties
IBRD	International Bank for Reconstruction and Development, part of World Bank along with IDA (International Development Association)
ICARDA	International Centre for Agricultural Research in Dry Areas
ICASALS	International Center for Arid and Semiarid Land Studies, Texas Tech University
ICC	International Criminal Court
ICD	Integrated Conservation and Development
ICDPs	Integrated Conservation and Development Projects
ICG	International Crisis Group
ICIJ	International Consortium of Investigative Journalists
ICO	International Coffee Organization
ICRAF	International Centre for Research in Agroforestry
ICRAN	International Reef Action Network

ICRI	International Coral Reef Initiative
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDA	International Development Association, part of the World Bank along with IBRD
IDEN	Integrated Development of the Eastern Nile project
IDEP	The United Nations African Institute for Economic Development and Planning, Headquartered in Dakar Senegal
IDP	Internally Displaced Persons
IEA	International Energy Agency
IFA	International Fertilizer Industry Association
IFAD	International Fund for Agricultural Development of the United Nations
IFAW	International Fund for Animal Welfare
IFC	International Finance Corporation of the World Bank
IFCP	Impenetrable Forest Conservation Project, Bwindi, Uganda
IFIs	International Financial Institutions
IFPRI	International Food Policy Research Institute
IGAD	Intergovernmental Authority for Development
IGFR	Institute for Global Futures Research
IGN	Institut Géographique National, French public state administrative establishment, produces & maintains geographical information for France, its overseas departments and territories
IGR	International Grains Council
IIED	International Institute for Environment and Development
IITA	International Institute of Tropical Agriculture
IKEA	International Franchise for home furnishings
ILC	Inland Logging Company
ILCA	International Livestock Center for Africa
ILO	International Labor Organization

IMC	International Marketing Council of South Africa
IMET	International Military Education and Training
IMF	International Monetary Fund
INE	National Ecology Institute, Mexico
INM	Integrated Nutrient Management
IPACC	Indigenous Peoples of Africa Coordinating Committee of the ACHPR (African Commission on Human and Peoples' Rights)
IPCC	Intergovernmental Panel On Climate Change
IPRI	International Peace Research Institute, Oslo, Norway
IPT	Intermittent Preventive Treatment
IRC	International Resource Center
IRD	<i>Institut de Recherche pour le Développement</i> , France
IRIN	United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Integrated Regional Information Network (IRIN).
IRN	International Rivers Network
IRRI	International Rice Research Institute
IRZ	Institute of Animal Research, Cameroon
IS	Institute for Policy Studies, also IPS
ISFM	Integrated Soil Fertility Management
ISRA	Institut Senegalais de Recherches Agricoles
ISRIC	International Soil and Reference Information Center
IT	Information Technology
ITCZ	Inter-Tropical Convergence Zone ITCZ
ITE	Interactive Telematic Education
ITN	Insecticide Treated (Bed) Nets
ITTO	International Tropical Timber Organization
IUCN	International Union for the Conservation of Nature = World Conservation Union
IWRM	Integrated Water Resources Management

JECOR	United States-Saudi Arabian Joint Economic Commission
JEM	Justice and Equality Movement, Rebel Group Darfur, Sudan
JUKUMU	<i>Jumuiya ya Kuhifadhi Mazingira Ukutu</i> (Society for Conservation and Wise Use of Natural Resources in the Ukutu Area, Tanzania)
K	Potassium
K	Kwacha, Zambian Currency
KAS	Private Military Contractor/Mercenary group based out of England
KNP	Kahuzi-Biega National Park
KCS	Kalahari Conservation Society
KFA	Kenya Farmers' Association
KFW	German Development Bank
Kg	Kilogram
Km	Kilometers
KNCS	Kwazulu Natal Nature Conservation Service
KNP	Kruger National Park
KPCS	Kimberley Process Certification Scheme, Diamonds
KPNR	Klaserie Private Nature Reserve
KWC	Kenya Wildlife Coalition, animal rights NGO
Kwh	kilowatt hour equal a 1,000 watt light bulb for one hour
KWS	Kenya Wildlife Service
KWWG	Kenya Wildlife Working Group
KY	<i>Kabaka Yekka</i> party or "The King Alone" party, Uganda
LC's	Local Councils old RC's, Uganda
LCCs	Local Conservation Committees, Uganda
LDC	Least Developed Countries, Less Developed Countries
LEAT	Lawyers Environmental Action Team, Tanzania
LEI	Low-External Input

LGRP	Local Government Reform Program
LHDA	Lesotho Highlands Development Authority
LHWP	Lesotho Highlands Water Project
LICs	Low Income Countries
LIFE	Namibia "Living in a Finite Environment"
LIRD ^P	Luangwa Integrated Resources Development Program
LISA	Low Mineral Input Sustainable Agriculture
LMGR	Lake Mburo Game Reserve
LMICs	Lower Middle-Income Countries
LMNP	Lake Mburo National Park
LRA	Lord's Resistance Army, Uganda
LRDC	Consulting Firm, undertook agricultural study around Balingho Anti-Salinity Barrage the Gambia in 1984
LWAG	Livestock and Wildlife Advisory Group of Department for International Development (DFID)
LONRHO	London Rhodesia Company
LTD	Limited
LURD	Liberians United for Reconciliation and Democracy
m	Meter
MAB	U.S. Man and the Biosphere Program
MAI	Multilateral Agreement on Investment
MBD	Million Barrels Per Day
MBIFCT	Mgahinga Bwindi Impenetrable Forest Conservation Trust
MC	Military Cross (MC): third level military decoration awarded to officers & since 1993 other ranks of the British Army & formerly to officers of other Commonwealth countries
MCF	Malignant Catarrhal Fever
MDB	Multinational Development Banks

MDC	Movement for Democratic Change
MEA	Multilateral Environmental Agreement
MEF	Ministry of Environment and Forests, Congo Brazzaville
MEI	Morpho-Edaphic Index
MEND	Movement for the Emancipation of the Niger Delta
MET	Ministry of Environment and Tourism, Namibia
MFN	Most Favored Nation, EU Everything But Arms trade agreement
MGD	Million Gallons Per Day
mi.	Mile
MIKE	Monitoring Of Illegally Killed Elephants program of CITES
MINEF	<i>Ministere de la Environment et Forets</i> , Ministry of Environment and Forests
MINURSO	<i>Mission des Nations Unies Pour l'Organisation d'Un Referendum Au Sahara Occidental/ United Nations Mission for the Referendum in Western Sahara</i>
MIT	Massachusetts Institute of Technology
MLD	Minimal Logging diameter = <i>Diamètre Minimum d'Exploitabilité</i> (DME)
mm	Millimeters
MNCs	Multi-National Corporations = MNEs = TNCs
MNEs	Multi-National Enterprises = MNCs = TNCs
MNP	Netherlands Environmental Assessment Agency
MNRT	Ministry of Natural Resources and Tourism
MODEL	Movement for Democracy in Liberia
MONUC	<i>Mission de l'Organisation des Nations Unies en République Démocratique du Congo</i>
MOU	Memorandum of Understanding
MP	Member of Parliament
MPA	Marine Protected Area
MPLA	<i>Movimento Popular da Libertaçao de Angloa</i> /Popular Movement for the Liberation of Angola

MPRI	Military Professional Resources Inc., private military contractor
MRND	<i>Mouvement Révolutionnaire National pour le Développement/National Revolutionary Movement for Development</i> , Rwanda – Hutu Party with power base in north
M.S.	Masters of Science
MSL	Mean Sea Level
MSY	Maximum Sustained Yield
MT	Metric Tons
MUIENR	Makerere University Institute of Environment and Natural Resources, Uganda
MW	Mega Watts
MWPI	Maryland Wood Processing Industries in Liberia
N	Nitrogen
NAAEC	North American Agreement on Environmental Cooperation
NaCl	Sodium Chloride, Salt
NACSO	Namibian Association of CBNRM Support Organizations
NADB	North American Development Bank
NAFTA	North American Free Trade Agreement
NAMA	Non-Agricultural Market Access
NAMC	The National Agricultural Marketing Council, South Africa
NAPF	North American Pronghorn Foundation
NARS	National Agricultural Research Systems
NAS	Nation Academy of Sciences
NASREC	Convention Center, Johannesburg, South Africa where WSSD held
NBI	Nile Basin Initiative
NBP	Northern Basalt Plains
\$ND	Namibian Dollar
NDA	National Democratic Alliance, Uganda
NEPAD	New Partnership for Africa's Development

NFP	Net Factor Payments
NIF	National Islamic Front, Sudan
NG NGO	Ngamiland, Botswana (hunting tourism blocks) Non-Governmental Organization
NIPHE	National Institute of Public Health and the Environment of the Netherlands
NIS	New Independent States of the former Soviet Union
NNP	Nouabalé-Ndoki National Park, Congo
N ₂ O	Nitrous Oxide
NOAA	National Oceanic & Atmospheric Administration, U.S. Department of Commerce
NORAD	Norwegian Agency for International Development
NP	National Park
NPB	Natal Parks Board now KwaZulu-Natal Wildlife
NPAD	National Policy on Agricultural Development, Botswana
NPFL	National Patriotic Front of Liberia
NPK	Nitrogen, Phosphorous and Potassium Fertilizer = N/P/K
NPWS	National Parks and Wildlife Service
NRA	National Resistance Army, Uganda
NRDC	Natural Resources Defense Council
NRM	Natural Resources Management
NRM	National Resistance Movement
NRMP	Natural Resources Management Program
NSA	National Security Agency, USA
NTFP	Non-Timber Forest Products, often called Minor Forest Products
NTTA	Netherlands Timber Trade Association replaced Kerhout Foundation
NWTF	National Wild Turkey Foundation
OA	Official Aid
OAU	Organization of African Union

OCFSA	Organization for the Conservation of African Wildlife
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
ODA	British Overseas Development Administration, now called DEFID
ODA	Official Development Assistance = Foreign Aid
ODF	Official Development Finance
ODM	Orange Democratic Movement, Kenya
OED	Operations Evaluation Department, World Bank: IBRD/IDA
OECD	Organization for Economic Cooperation and Development
OFR	Okapi Faunal Reserve
OMA	Office of Management Authority
OMV	Australian Oil Company
OMVG	Gambia River Basin Development Organization/ <i>Organisation pour la Mise en Valeur du Fleuve Gambie</i>
OMVS	<i>Organisation Pour la Mise en Valeur du Fleuve Sénégal/Senegal River Basin</i> Development Organization
ONCAD	<i>Office National pour la Commercialization Agricole et du Developpement</i> , the National Agricultural Marketing Board of Senegal
OOF	Other Official Flows
OPC	Other Private Capital
OPEC	Organization of the Petroleum Exporting Countries
ORI	Oceanographic Research Institute
ORSTOM	<i>Office de la Recherche Scientifique et Technique Outre-Mer</i> now CIRAD
OSA	Office of Scientific Authority
OSLEC	Operation Sovereign Legitimacy
OTC	Oriental Timber Company in Liberia
OVI	Onderstepoort, Veterinary Institute, South Africa
OXFAM	International Development, Relief and Human Rights Watch Dog NGO
P	Phosphorous

PA	Protected Area
PAC	Problem Animal Control
PAGEN	<i>Projet de Partenariat Pour la Amelioration de la Gestion des Ecosystems Naturels</i> - Partner For Improvement of Management Of Natural Ecosystems, Burkina Faso
PARMEHUTU	<i>Parti du Mouvement et de l'Emmancipation Hutu</i> /Party of the Movement of Emancipation of the Bahutu
PC	Popular Congress, old Popular National Congress of Hassan el-Turabi, Sudan
PDL	Poverty Datum Line, living on < \$US 1/day
PETA	People for the Ethical Treatment of Animals
PFC	Energy Consulting Firm
pH	Measurement of acidity
PHASA	Professional Hunters Association of South Africa
PHAZ	Professional Hunters Association of Zambia
PIV	<i>Périmètres Irrigués Villageois</i> /Villager Irrigated Perimeters
PL480	Public Law 480 “Food for Peace” of the United States
PMACs	Park Management Advisory Committees, Uganda
PMCs	Private Military Companies/Contractors
PNU	Party of National Unity, Kenya
PO	Pastoral Organizations
PPCP	Public, Private Community Partnership
PPMV	Parts Per Million by Volume
PPT	Parts Per Thousand
PR	Phosphate Rock
PRA	People's Redemption Army, Uganda
PRASET	<i>Projet Regional d'Appui au Secteur de l'Elevage Transhumant</i>
PRMCs	Parish Resource Management Committees, Uganda
PROFEPA	Office of the Attorney General for Environmental Protection, Mexico

PRONAGEN	National Natural Ecosystem Management Program
PRSPs	Poverty Reduction Strategy Papers of IMF and World Bank
PSC	Private Sector Conservation
PSE	Producer Subsidy Equivalent/ Producer Support Estimate
%PSE	Percent Producer Subsidy Equivalent/Percent Producer Support Estimate
PUE	<i>Prises Par Unité d'Effort</i> = Catch Per Unit of Effort - CUE
PUSIC	Party for Unity and Safeguarding of the Integrity of Congo/ <i>Parti pour l'unité et la sauvegarde de l'intégrité du Congo</i>
QENP	Queen Elizabeth National Park
QR	Quantitative Restrictions
RADER	<i>Rassemblement Démocratique Rwandaise/Rwandan Democratic Rally/Assembly</i>
RADs	Remote Area Dwellers
RADS	Remote Area Dweller Settlements
RAF	Rwandese Armed Forces = <i>Forces Armées Rwandaises/FAR</i> - Hutu
RAMSAR	International Convention on Wetlands or the “Ramsar Convention” signed in Ramsar, Iran
RC's	Resistance Committees/Councils, Uganda – now Local Councils
RCA	<i>République Centrale Africaine</i> = Central African Republic (CAR) in English
RCD-Goma	Congolese Rally for Democracy/ <i>Rassemblement Congolais pour la Démocratie – National</i> , Rwandan backed fighting in DRC
RCD-ML	Congolese Rally for Democracy – Liberation Movement/ <i>Rassemblement Congolais pour la Démocratie – Mouvement de Libération</i> (RCD-ML) Beni in North Kivu in theory integrated into DRC transitional government
RCD-National	Congolese Rally for Democracy-National/ <i>Rassemblement Congolais pour la Démocratie - National</i> in Isiro and Watsa of northeast in theory integrated into DRC transitional government.
RandD	Research and Development
RDA	Recommended Daily Allowance (Nutrition)
RDC	Rural District Council

RDR	<i>Rassemblement Democratique pour la Retour</i> , old Hutu FAR reassembled in the DRC
RENAMO	<i>Resistència National Moçambicana</i>
RMAs	Range Management Areas
RMC	Resource Management Committees
RMEF	Rocky Mountain Elk Foundation
RENAMO	<i>Resistència National Moçambicana</i>
RMNP	Rwenzori Mountains National Park “Mountains of the Moon,” Uganda
RMS	Rwenzori Mountaineering Services, Indigenous Mountain Climbing and Backpacking Service, Uganda
RONCO	American Consulting Firm and Private Military Contractor (PMC)
ROSA	Regional Office, Southern Africa, of International Union for the Conservation Of Nature (IUCN)= World Conservation Union
RPF	Rwandan Patriotic Front – Tutsi under Kagame
RSA	Republic of South Africa
RUF	Revolutionary United Front rebels, Sierra Leone
RWS	Rurambira Wildlife Society, Uganda
S.A.	South Africa
SACCAR	Southern Africa Centre for Cooperation in Agricultural Research and Training
SACU	Southern African Customs Union
SADC	Southern African Development Community
SADCC	Southern African Co-ordination Conference, now SADC
SAED	<i>Société d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal</i>
SALs	Structural Adjustment Loans
SANParks	South African National Parks
SAP	Structural Adjustment Policies ≈ ESAP, Economic Structural Adjustment Program
SARPO	Southern African Regional Program Office of WWF

SARS	Severe Acute Respiratory Syndrome, a viral respiratory illness caused by a corona virus
SAS	Special Air Service, Britain
SASUSG	Southern Africa Sustainable Use Specialist Group, IUCN – The World Conservation Union Regional Office for Southern Africa
SAWEG	The Sahelian Wetlands Expert Group
SCAC	Service de Cooperation et d'Action Culturelle
SCI	Safari Club International, international hunting and conservation body
SCIP	Support For Community-Initiated Projects
SCOA	<i>Société Commerciale Ouest Africaine</i>
SCP	Selous Conservation Program
SCUBA	Self-Contained Underwater Breathing Apparatus
SDR	Special Drawing Rights, used by International Monetary Fund to determine exchange rates
Sec	Second
SEMARNAP	Secretariat of the Environment, Natural Resources, and Fisheries, Mexico
SEMRY	<i>Secteur Expérimental de Modernisation de Riziculture de Yagoua</i> , Rice Perimeters, Extreme North, Cameroon
SEMNORD	<i>Secteur Expérimental de Modernization du Nord</i> , Cameroon
SFI	Soil Fertility Initiative of the World Bank
SFV	Simian Foamy Virus
SGR	Selous Game Reserve
SIDA	Swedish International Development Agency
SIP	<i>Société Indigènes de Prévoyances</i>
SIS	British Secret Intelligence Service
SIV	Simian Immunodeficiency Virus
SLM/A	Sudan Liberation Movement/Army, Darfur, Sudan
S & L	Savings and Loans
SLA	Sudan Liberation Army, Darfur, Sudan

SNA	System of National Accounts
SNPC	Société Nationale des Pétroles du Congo
SNV	<i>Service National des Vocations, France</i>
SOCEBO	<i>Société Congolaise d'Exploitation Du Bois</i>
SODICOTON	French/Cameroon Government owned cotton company using small farmers to cultivate around the parks of Bénoué, Faro and Bouba-Njida, North Province, Cameroon
SOGREAH	<i>Société Grenobloise d'Etudes et d'Applications Hydrauliques</i> , French Consulting Firm
SOM	Soil Organic Matter
SONEX	RCD-Goma's financial arm, rebel group in DRC
SNPC	<i>Société Nationale des Pétroles du Congo</i> , State Oil Company, Congo Brazzaville
SPA	Protected Areas
SPFS	Special Program for Food Security of the FAO
SPLA	Sudan People's Liberation Army, John Garang, Southern Sudan
SPLM	Sudan People's Liberation Movement, John Garang, Southern Sudan
SRB	Senegal River Basin
SRBMA	Senegal River Basin Monitoring Activity
SRF	Systematic Reconnaissance Flight Technique
SRO	Strengthening Agricultural Research
SRP	Soluble Reactive Phosphorus = Dissolved (Filterable) Orthophosphate
SSA	Sub-Saharan Africa
SSARR	Streamflow Synthesis and Reservoir Regulation
SSC	Species Survival Commission of the International Union for the Conservation of Nature = World Conservation Union
SSDF	South Sudan Defense Forces, Pro-Government
SSG	Special Safeguard Measures, trade
SST	Sea-Surface Temperature

SR-52	Genetically Modified (GM) Maize, Zimbabwe
SVF	Simian Foamy Virus
SWAPO	Southwest Africa People's Organization
TA	Tribal Authority
TAL	Transoceanic abort landing sites for the Space Shuttle
TANAPA	Tanzania National Parks
TAWICO	Tanzania Wildlife Corporation
TAWIRI	Tanzania Wildlife Research Institute, Arusha, Tanzania
TB	Tuberculosis
TCI	Trade Competitiveness Index
TDCA	Trade, Development and Cooperation Agreement – with European Union
TDS	Total Dissolved Solids
TED	Trade Environment Database, American University
TEK	Traditional Ecological Knowledge
TFCA's	Transfrontier Conservation Areas
TFCS	Turkana Fishermen's Cooperative
TGLP	Botswana, Tribal Grazing and Land Policy of 1975
TGT	Tanzania Game Trackers
TLU	Tropical Livestock Units
TNA	Tanzania National Archives
TNC	The Nature Conservancy
TNCs	Transnational Corporations = MNCs = MNEs
TNP	Tarangire National Park
TRAFFIC	Trade Records Analysis of Flora and Fauna in International Commerce
TRIDOM	Dja-Boumba Bek-Nki-Odzala-Minkébé transfrontier reserve between Cameroon, Congo Brazzaville and Gabon funded by Global Environmental Facility (GEF)

TRT	<i>Thyssen Rheinstahltechnik GmbH</i> , German Consulting Co., Katwe Salt Works, Uganda
TSBF	Tropical Soil Biology and Fertility Program
TSCTI	Trans-Sahara Counterterrorism Initiative
TSE	Total Support Estimate
TSH	Tourist Safari Hunting
TTL	Tribal Trust Lands, Zimbabwe
TUT	Tshwane University of Technology, South Africa
TVA	Tennessee Valley Authority
UAC	United African Corporation, owned by Margaret Kenyatta, linked to illegal ivory sales
UAF	<i>Unite d'Aménagement Forestier</i> , Forest block
UFA	<i>Unités Forestières d'Aménagement</i> , Commercial forest block
UCLA	University of Los Angeles, California
UCMP	University of California, Berkeley, Museum of Paleontology
UDC	Uganda Development Corporation
UDI	Unilateral Declaration of Independence, Zimbabwe
UGGF	<i>L'Union Des Groupement De Gestion Forestiere</i> = Union of Forestry Management Groups
UFA	<i>Unités Forestières d'Aménagement</i>
UK	United Kingdom
UMICs	Upper Middle-Income Countries
UN	United Nations
UNAIDS	Joint United Nations Program on HIV/AIDS
UNAMIR	United Nations Assistance Mission in Rwanda
UNAMSIL	United Nations Mission in Sierra Leone
UNAR	<i>Union Nationale Rwandaise</i> /Rwandan National Union
UNCHS	United Nations Centre for Human Settlements - Habitat

UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNECLAC	Economic Commission for Latin America and the Caribbean, United Nations Environment Program
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commission for Refugees
UNIP	United National Independence Party, Zambia
UNITA	<i>União Nacional Para a Independência Total de Angola/</i> National Union for the Total Independence of Angola
UNMEE	United Nations Mission in Ethiopia and Eritrea
UNMIL	United Nations Mission in Liberia
UNOCAL	American-based oil company
UNP	Uganda National Parks. Combined with Game department to form today's Uganda Wildlife Authority (UWA)
UNRF	Uganda National Rescue/Resistance Front, Uganda
UNSC	United Nations Security Council
UPC	Uganda People's Congress
UPC	<i>Union des Patriotes Congolais</i> , Hema ethic group serving as proxy army in DRC for Rwanda after Rwanda pulled out of DRC
UPDF	Ugandan People's Defense Forces
UPRONA	<i>Unité Pour le Progrès National</i> /Party of National Unity and Progress
U.S. & USA	United States of America
USAID	United States Agency for International Development
USBC	U.S. Bureau of the Census
USDA	United States Department of Agriculture
USDTA	U.S. Trade and Development Agency
USEPA	U.S. Environmental Protection Agency

USFWS	U.S. Fish and Wildlife Service = USF&WS
USGS	United States Geological Survey
USH	Uganda Shillings
USITC	United States International Trade Commission
USMCOC	United States Mexican Chamber of Commerce
USSR	Union of Soviet Socialist Republics
USTR	U.S. Trade Representative
UWA	Uganda Wildlife Authority
VA	Village Assembly, Tanzania
VAGs	Village Action Groups, Zambia
VC	Village Council, Tanzania
VC	Victoria Cross (VC): highest recognition for valor "in the face of the enemy" awarded to members of British & Commonwealth forces of any rank in any service, and civilians under military command.
WFP	World Food Program
VIDCOs	Village Development Committees, Zimbabwe
VIF	Village Investment Funds, Burkina Faso
VNP	Virungas National Park
VOA	Voice of America
VITA	Volunteers in Technical Assistance
VX	Nerve Gas
WADCO	Ward Development Committee, Zimbabwe
WASP	White Anglo-Saxon Protestant
WCD	World Commission on Dams
WCMC	World Conservation Monitoring Center
WCPA	World Commission on Protected Areas of the IUCN
WCS	Wildlife Conservation Society of the New York Zoological Society

WCU	Wildlife Conservation Unit, Burkina Faso
WCU	World Conservation Union
WD	Wildlife Division, Tanzania
WDM	World Development Movement NGO
WECARD	West and Central African Council for Agricultural Research and Development = CORAF in French
WFA	World Food Summit
WFP	World Food Program
WHO	World Health Organization
WIMSA	Working Group of Indigenous Minorities in Southern Africa
WINDFALL	Wildlife Industries New Development for All, Zimbabwe
WMA	Wildlife Management Area
WMAT	White Mountain Apache Tribe
WMSA	Wildlife Management Sub-Authority
WNBF	West Nile Bank Front, Uganda
W&ORD	Wildlife and Outdoor Recreation Division, White Mountain Apaches
WPC	IUCN World Parks Congress
WPT	The 1998 Wildlife Policy of Tanzania
WR	Wildlife Reserve
WRI	World Resources Institute
WSPA	World Society for the Protection of Animals
WSSCC	Water Supply and Sanitation Collaborative Council
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WUR	Wildlife User Rights, Uganda
WWF	World Wide Fund for Nature (formerly World Wildlife Fund)
WWI	World War I

WWII	World War II
WWS	Wengert Windrose Safaris
XSRATA	Coal mining company, Witbank, South Africa
Yr	Year
ZANU-PF	Zimbabwe African National Union – Patriotic Front
ZAPU	Zimbabwe African People's Union
ZAR	<i>Zuid Afrikaanse Republiek</i> /South African Republic
ZAWA	Zambia Wildlife Authority
ZD\$	Zimbabwe Dollar
ZDF	Zimbabwe Defense Force
ZESCO	Zambia Electricity Supply Corporation
ZIC	<i>Zone d'Intérêt Cynégétique</i> /Professional Hunting Blocks or Safari hunting blocks
ZICGC	<i>Zone d'Interet Cynégétique a Gestion Communautaire</i> (Community Hunting Area, Cameroon)
ZIMTRUST	Zimbabwe Trust, NGO
ZSC	Zambia Sugar Company

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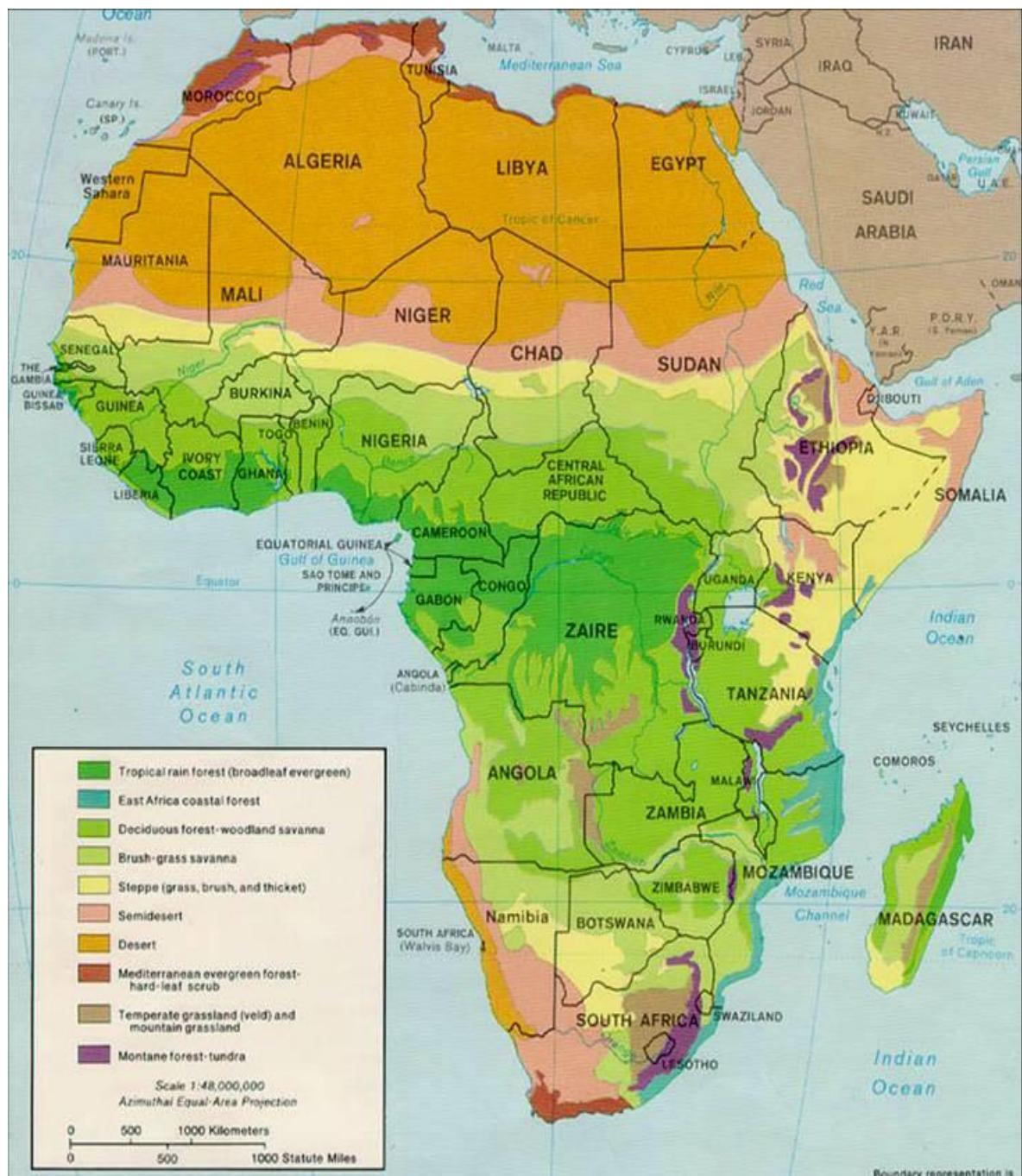
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Source: Principal Author, late 1990s

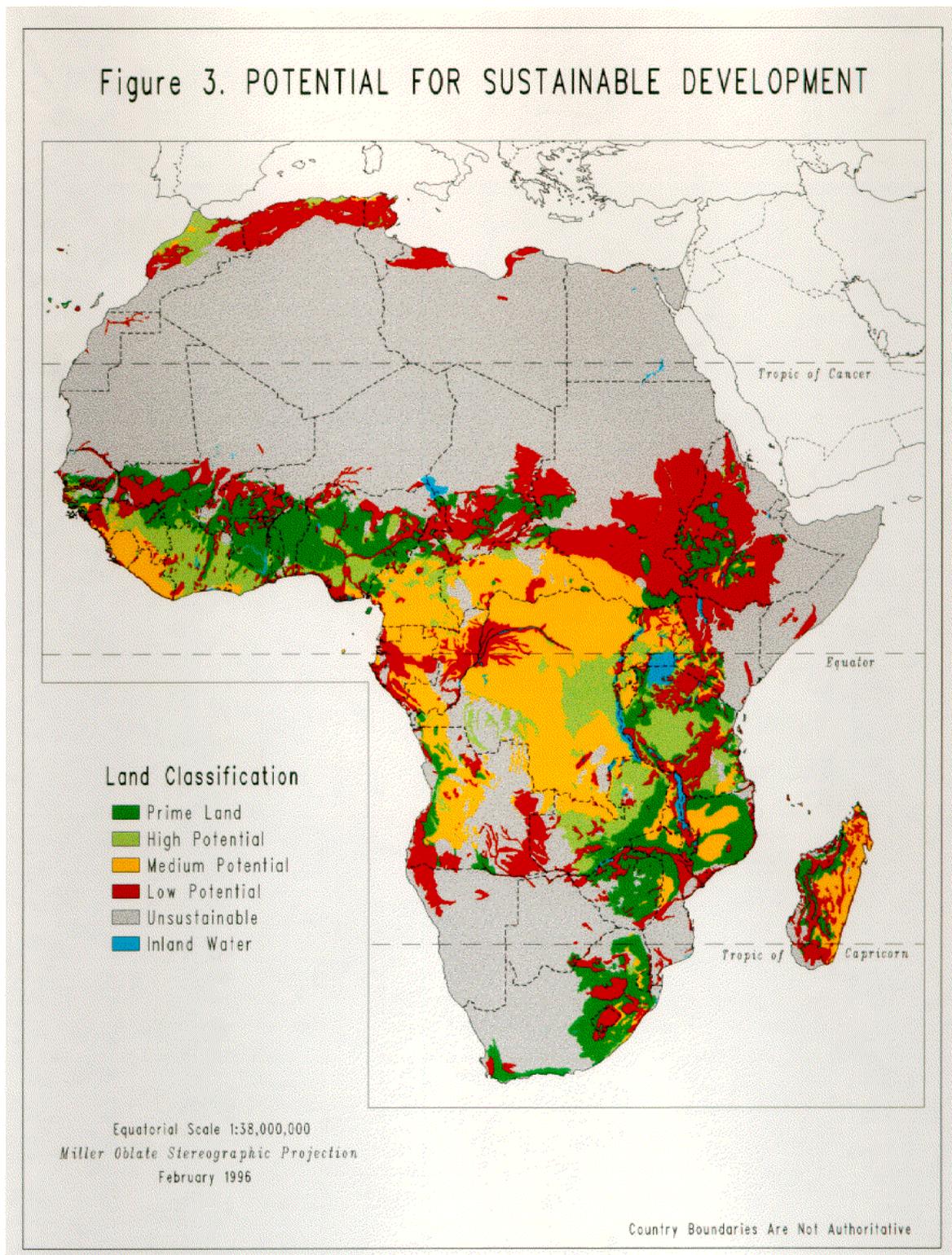
Figure 3.3: Sub-divided Kikuyu Highlands, Kenya with little room for expansion except into marginal areas putting them into conflict with traditional pastoralists in the 20th and 21st centuries



Note: In Sub-Saharan Africa, all categories may be considered as "Savanna" except "tropical forest," "temperate grassland," "montane forest," "Mediterranean ever-green forest," "East Africa coastal forest," and "desert"

Source: CIA (2004), with permission, Head, Earth Sciences and Map Library
University of California, Berkeley

Figure 5.1: African ecosystems



Source: Eswaran *et al.* (1996), with permission USDA + U.S. Government public domain

Figure 5.4: Land use potential for low-input agriculture in Africa



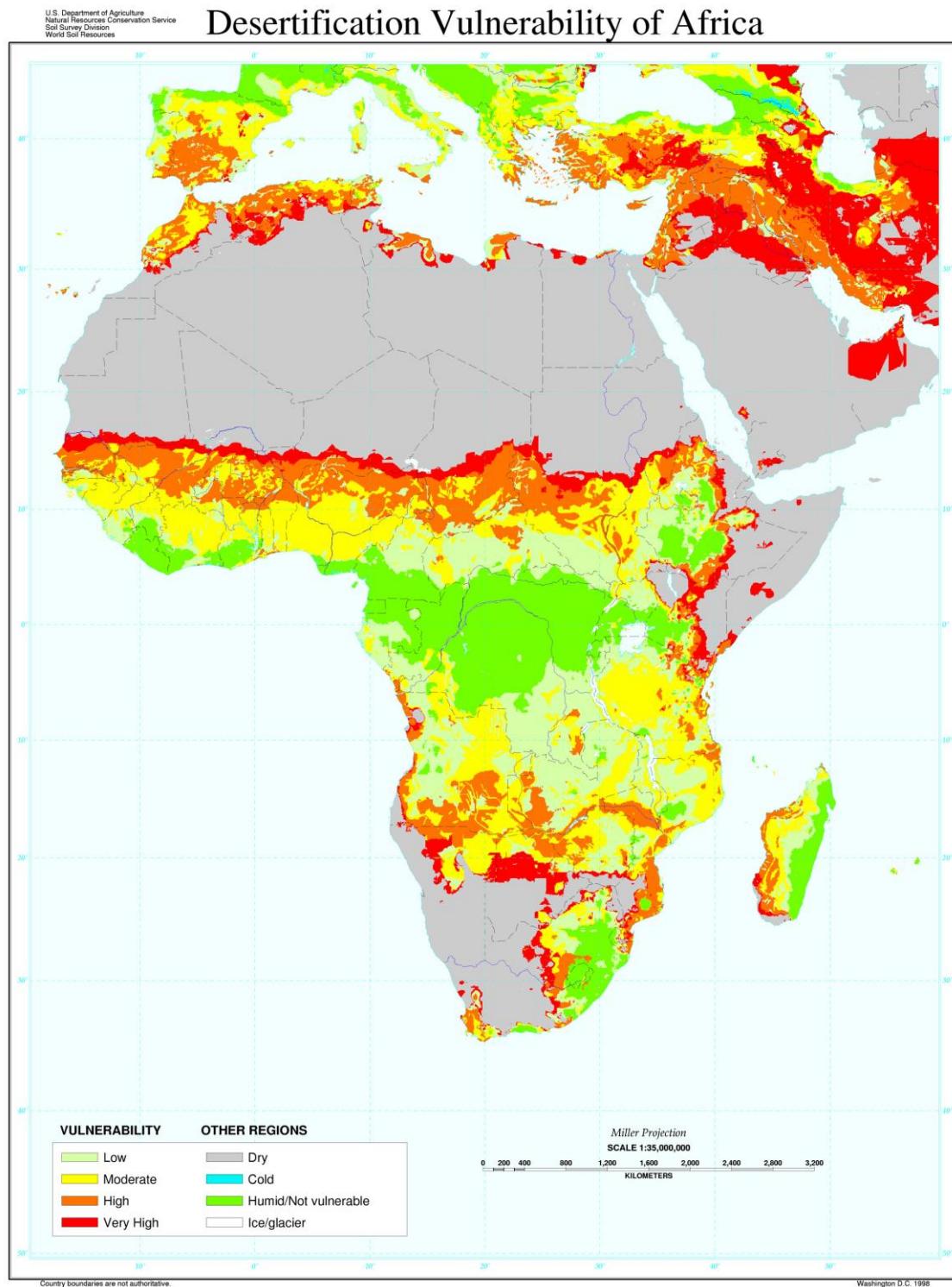
Source: Principal Author, 2000, Rift Valley taken from Nairobi/Naivasha Road

Figure 5.6: Movement of small-scale farmers, mainly Kikuyu into former Maasai grazing areas in Kenya, resulting in major conflicts in the 20/21st centuries



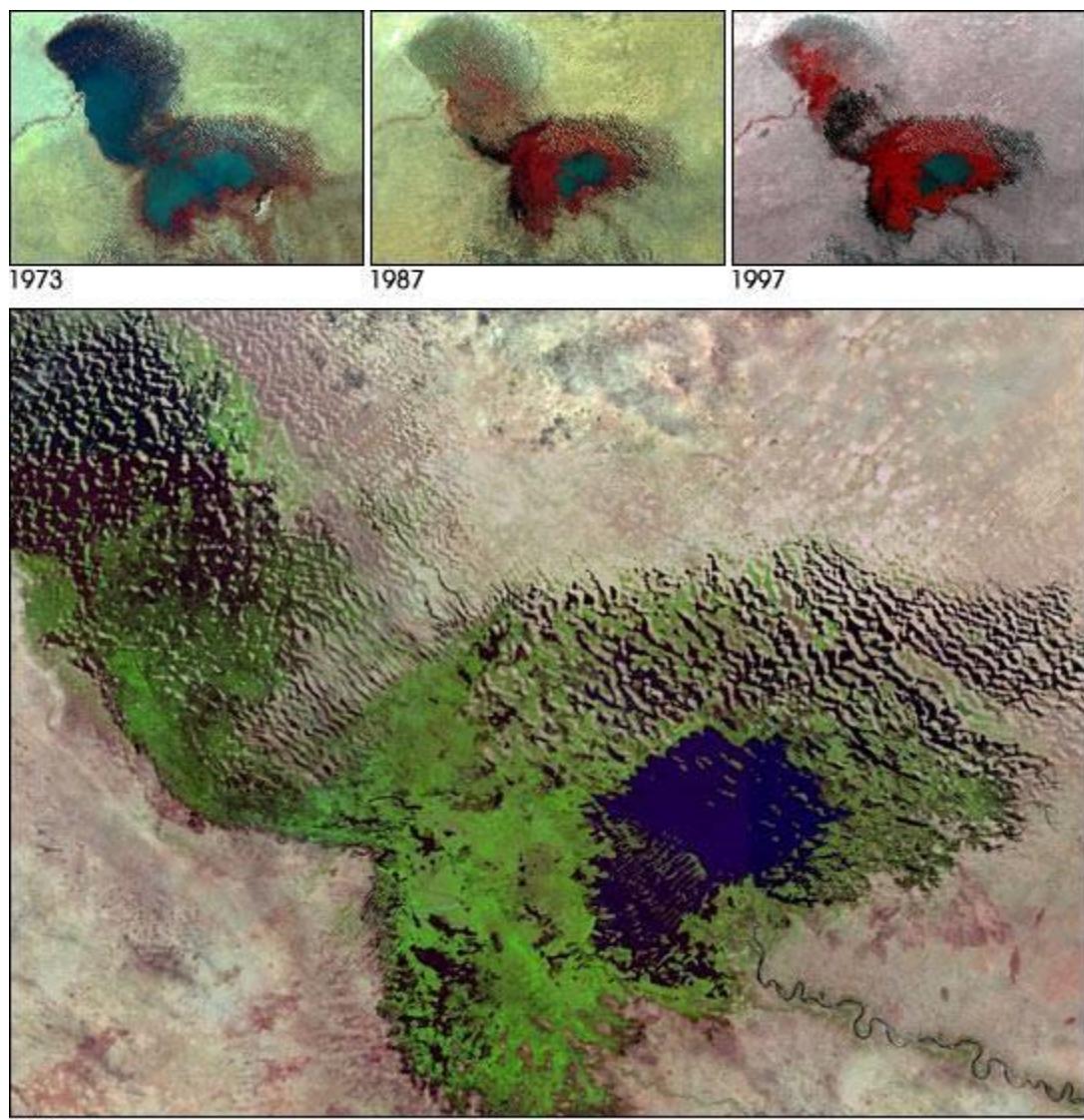
Source: NASA (2004), U.S. Government public domain

Figure 5.9: Fires from slash and burn agriculture west of Lake Tanganyika in East-Central Africa. May 23, 2004



Source: Reich, *et al.* (2001) with permission USDA + U.S. Government public domain

Figure 5.11: African areas vulnerable to desertification



Source: With permission: USGS Center for Earth Resources Observation and Science. "Data available from U.S. Geological Survey/EROS, Sioux Falls, SD"

Figure 7.6: Lake Chad from 1973 through 2001, declining in size after the 1970s drought and from withdrawal of upstream water for irrigation



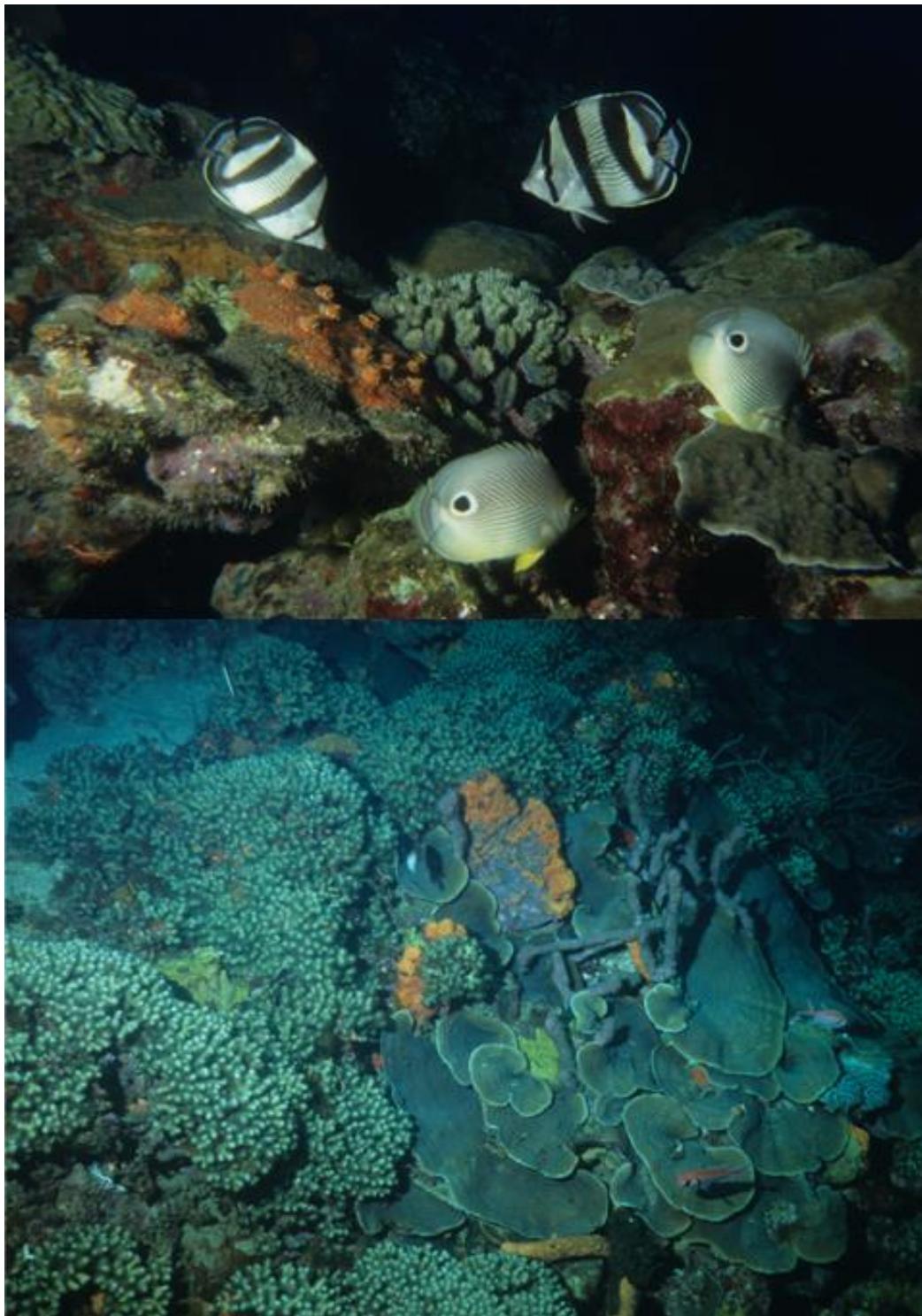
Source: Principal Author

Figure 8.1: Healthy coral reef, Roatan, Honduras, 1977



Source: Principal Author

**Figure 8.2: *Porites sp.* “finger coral” being smothered by epiphytic algae,
Dictyota sp., Grand Anse Beach Grenada, 1988**



Source: Principal Author

Figure 8.6: Healthy coral, outer bank reef at depth of 20 m (65 ft), West Coast, Barbados, 1988/89 (Top) & Questrelles Point, St. Vincents, 1989 (Bottom)



Source: Principal Author, Village of Kong with Tikar hunters
Cameroon, 2005



Source: Principal Author, Southeastern Cameroon,
Baka & Maka hunters, 2000

Figure 9.2: *Chasse libre* or self-guided hunting is a market niche, where local communities act as professional hunting guides for overseas hunters



Source: Principal Author, 1990S, Southeastern Cameroon

Figure 11.3: The Congo Basin's forests are being emptied of bushmeat and other resources



Source: Principal Author, 2003

Figure 2.1 Dozo “professional hunters” Burkina Faso



Source: Principal Author, late 1990s

Figure 2.3: Arbalete (crossbow), Baka Pygmies, Southeastern, Cameroon



Source: Principal Author, 2003

Figure 2.4: Traditional fallow “slash and burn” agriculture, Mozambique



Source: Principal Author, 1980s

Figure 5.5: Mountains of peanuts in Senegal's Groundnut Basin



Source: Principal Author, 2003, Mozambique

Figure 5.10: Deforestation in Sub-Saharan Africa is happening in dryland forests from decreased secondary forests on decreasing fallow land, agricultural expansion and from meeting the urban demand for charcoal



Source: Principal Author, Mahango Game Reserve, Okavango/Cubango River, during drought in the mid-1990s

Figure 6.1: Elephants play an important ecological role in the balance between the degree of grasses versus trees in savanna environments, impacting both habitat and biodiversity



Source: van Wilgen, Andreae, Goldammer and Lindesay (1997) in Kruger National Park with permission, Global Fire Monitoring Center (GFMC)

Figure 6.2: Same site, one area burned annually helping to encourage the maintenance of the savanna environment and the other excluded from burning for 35 years resulting in bush encroachment and moribund vegetation that has little value to wildlife



Source: Principal Author, 2003

Figure 6.3: Over-grazed Sahelian appearing habitat, free-ranging, Mozambique, low rainfall area with man and his livestock holding back the bush



Source: Principal Author, 2003

Figure 7.7: Kapenta fishing rigs on the Cahora Bassa Reservoir, Mozambique



In 1959, this large *Colpophyllia natans* (giant brain coral) was healthy and intact.



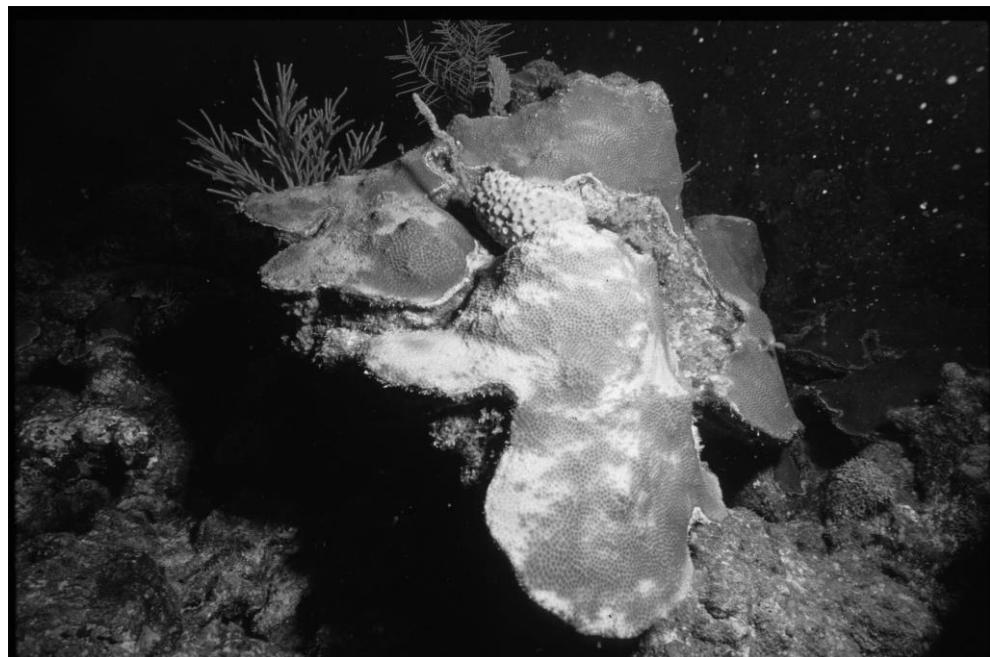
In 1988, following Hurricane Donna of 1960, the giant brain coral is still healthy.



By the summer of 1998, most of the giant brain coral is dead and covered with epiphytic (benthic) algae and sea whips (Gorgonian corals).

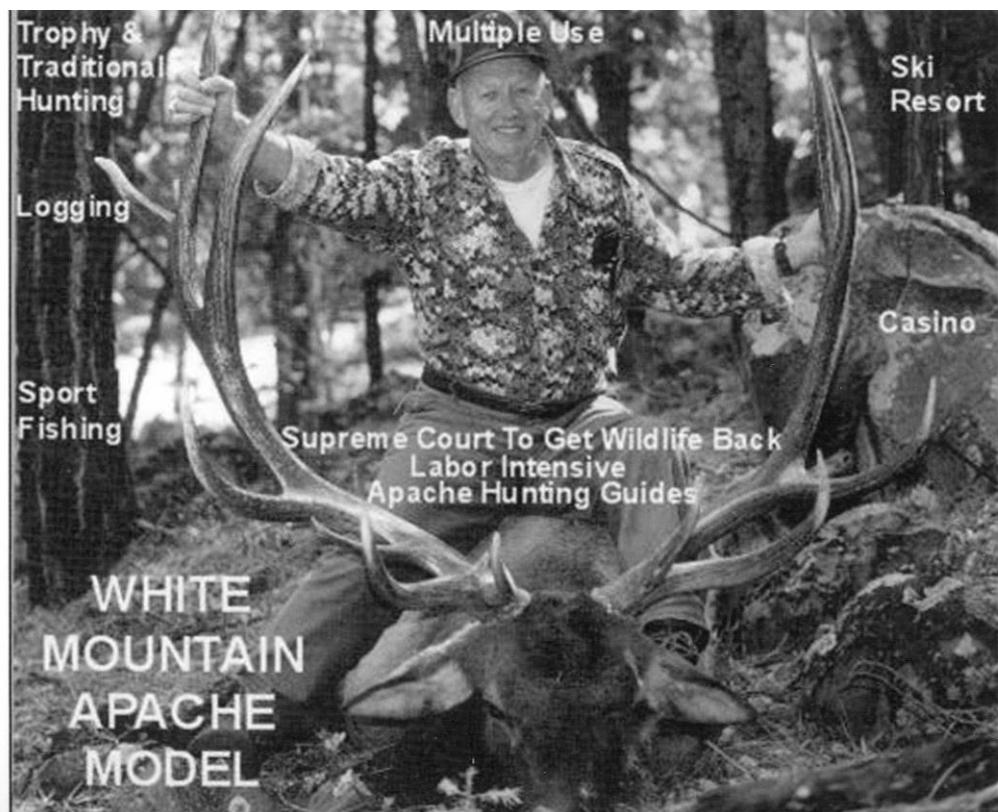
Source: U.S. Dept. of Interior (2002), U.S. Coral Reef Task Force (CRTF), U.S. Department of Interior, public domain

Figure 8.3: The Florida Keys coral story: Then and now, 1959-1998



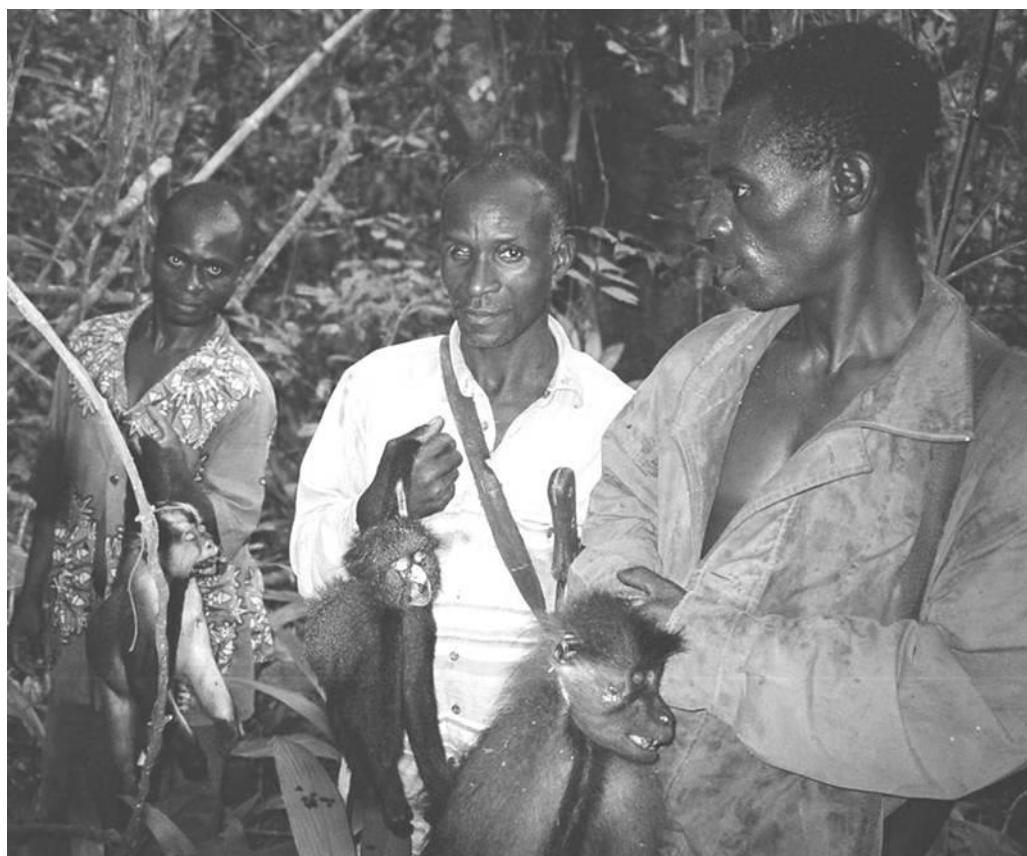
Source: Principal Author

Figure 8.5: Coral bleaching, West Coast, Barbados, 1988/89; zooxanthellae giving, coral color, have been extruded, but coral is still alive



Source: Extracted from: Caid (2002) with permission, Caid

Figure 9.8: The White Mountain Apache conservation model



Source: Principal Author, Village of Kong, transition area between forest and savanna of Cameroon, 2005

Figure 10.3: Bushmeat supplies an important source of protein to rural Africans in both savanna and forest biomes



Source: Principal Author, late 1990s

Figure 11.2: Logging roads fragment the forest and allow uncontrolled access by poachers



Source: Kennedy/Mabutu:@corbis, Bush/Kabila: www.whitehouse.gov, public domain

Figure 13.3: American imperialism in Africa dates back to the 1960s and continues into the 21st century

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