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10

An Economic View on Wildlife Management Areas in Botswana

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The Community-based Natural Resource Management Support Programme is a joint initiative by SNV Botswana and IUCN Botswana. It is built on SNV's experience in CBNRM pilot projects at the grassroots level and on IUCN's expertise in information sharing, documentation of project approaches, and establishing dialogue between Non-Governmental Organisations, Government and private sector on a national, regional and international level. The three main objectives of the programme are: 1) to establish a focal point for CBNRM in Botswana through support to the Botswana Community-based Organisation Network (BOCOBONET). 2) To make an inventory of and further develop CBNRM project approaches and best practices, and disseminate knowledge regarding implementation of CBNRM activities through the provision of information and technical advice to CBNRM actors. 3) To improve dialogue and co-ordination between CBOs, NGOs, private sector and Government. For more information, visit the Internet on http://www.cbnrm.bw

Foreword

The development and implementation of the CBNRM approach in Botswana has so far largely focussed on social aspects (empowerment of communities) and environmental aspects (land use and management planning and wildlife conservation). An economic analysis of the various land use options available and building up knowledge to allow for more economically informed natural resource management decisions never really featured.

This paper aims to encourage an economic view on resource utilisation in Wildlife Management Areas in Botswana, as successful CBNRM projects are not only expected to be ecologically sustainable but also economically viable. The use of economic concepts, methodologies and the availability of economic data are vital to be able to assess the viability of land use options under community management. The paper from Jaap Arntzen, who is director of the Applied Research Centre in Gaborone[1] makes very clear that the necessary data to make the economic assessments are at present largely lacking. We hope that the relevant organisations find the argument convincing enough to start collecting and analysing the necessary economic information and to look at CBNRM regularly "through the glasses of an economist".

This document is the tenth in the Occasional Paper Series of the IUCN/SNV CBNRM Support Programme. The papers intend to promote CBNRM in Botswana by providing information and documenting experiences and lessons learnt during the implementation of the concept by the practitioners in this field. Relevant CBNRM related information assists in bringing together all stakeholders who have an interest in what the concept stands for: social and economic empowerment of rural communities, and natural resources conservation. The Series is aimed therefore at all practitioners who work with CBNRM in Botswana, and is intended to provide information that assists in successfully applying the concept. This paper as well as previous issues is also available on the web site of the CBNRM Support Programme: http://www.cbnrm.bw

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Abbreviations

BIDPA	Botswana Institute for Development Policy Analysis
CBA	Cost-Benefit Analysis
CBNRM	Community-based Natural Resources Management
CBO	Community-based Organisation
CECT	Chobe Enclave Conservation Trust
IRR	Internal Rate of Return
LDA	Livestock Dominated Areas
NCSA	National Conservation Strategy Agency
NPV	Net Present Value
TEV	Total Economic Value
VTC	Village Trust Committee
WMA	Wildlife Management Area

Introduction

Botswana's Wildlife Management Areas (WMAs) date back to 1986, and now cover around 22% of the country. These areas are located in the thinly populated, remote and poor western and northern parts of Botswana. Economic opportunities are usually very limited and most people living in these areas traditionally engage in hunting and gathering. Wildlife utilisation is the primary form of land use in WMAs and is therefore assumed to be the main local source of livelihood for local people. In most WMAs, government has granted local communities the right to use the wildlife resources subject to government regulations such as the requirement to form a trust, to prepare and adhere to a management plan for the area and the need to apply for a hunting quota. Community-based Natural Resource Management (CBNRM) of the natural resources in the WMAs offers an opportunity for rural development.

WMAs also bring along development constraints. Agriculture is subject to restrictions. For example no livestock boreholes are permitted outside the community zones of the WMAs. The (draft) WMA regulations mention maximum livestock numbers. The WMAs have a profound impact on the livelihood opportunities of the local population. Knowing that WMAs (especially in western Botswana) are resource-poor areas one wonder to what extent WMAs are able to improve local livelihoods.

Insert figure 1 with location of WMAs and major Parks/ Reserves, get map from JB

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This question needs to be considered within the long-term development perspective as articulated in Vision 2016. Vision 2016 was launched in 1997 and it formulated ambitious and challenging development targets for the country. These include the eradication of absolute poverty by the year 2016. This means that all Batswana should be able to meet their basic needs and live above the poverty datum line. To achieve this objective, the per capita income needs to triple, requiring an annual economic growth rate of 8% in real terms (i.e. excluding inflation). Given the widespread poverty in WMAs, incomes in WMAs need to increase much faster, probably by 15 to 20% per annum. A rapid and sustained increase of wildlife benefits is essential. Therefore, Vision 2016 states that "the wildlife resources of Botswana will be managed for the sustainable benefit of the local communities, and in the interests of the environment as a whole" (p. 7).

WMAs have to demonstrate the economic value of natural resources, particularly wildlife, and their income generating capacity for the local population. This poses an enormous development challenge to WMAs because consumptive use of wildlife is generally no longer an important source of livelihoods in most rural areas (BIDPA, 2001).

In Botswana, the economic aspects of CBNRM have received considerably less attention than environmental (wildlife conservation) and social aspects (empowerment of the local population). This paper adopts a more economic-oriented perspective towards community-based management of WMAs and focuses on the question to what extent wildlife utilisation is able to achieve the required large and sustainable increase in rural livelihoods as envisaged in Government long-perspective thinking. If the potential of wildlife to reach that aim is limited, should other forms of land use be stimulated in WMAs?

Given the current data limitations, it is impossible to give conclusive answers on these questions at this stage. More research is needed into the economic viability and performance of CBNRM projects in Botswana. Such research would be possible in view of the growth in the number and duration of CBNRM projects, and recommendations in this paper stress the importance to launch this research without delay.

The paper introduces three economic concepts (rent, value and prices) with the aim to encourage sound economic analysis as part of CBNRM planning and implementation in Botswana. The main body of the paper reviews the economic viability of wildlife utilisation options. This is followed by the assessment of the direct use value of rangelands in the Kgalagadi North, and an example of an economic assessment of possible land-use options of Controlled Hunting Area KD2 (Zutshwa). A concluding section highlights "economic" issues for further investigation and debate.

CBNRM Projects in Botswana

CBNRM projects have mushroomed in the 1990s in Botswana. According to the 2001 CBNRM Status Report, 46 community-based organisations (CBOs) were registered in eight districts covering 130 villages and a population of around 40 000. In 1993, there was only one registered CBO, which covered five villages. The income from joint ventures between CBOs and private companies was P 6.4 million or P 162.86 per person in 2001. This rapid growth demonstrates the growing interest of communities as well as the economic potential of the CBNRM approach, particularly in areas with a high wildlife density. An additional reason is that most WMAs offer very few livelihood alternatives other than natural resource use and subsistence agriculture. The data in Botswana concur with experiences from Zimbabwe that show that the returns from CBNRM are positively related to wildlife densities and negatively associated with population density (Bond, 1999).

Given the importance of high wildlife densities for CBNRM to be successful, doubts exist about the viability of wildlife-based CBNRM in low wildlife density areas such as Ghanzi and Kgalagadi. This paper will show however that the initial results for the case study Kgalagadi North are encouraging.

Jones (2002) summarised the experiences of the oldest CBNRM project in Botswana (Chobe Enclave Community Trust). Some of the most important economic observations are summarised in the box below. Generally, there is need for a more economic approach towards the project. Income has risen sharply due to tendering and the proximity of Chobe National Park. It becomes clear from the report that cost data are largely lacking, and therefore overall profitability is not known. Economic skills are lacking within the Trust and amongst the agencies that offer assistance. Productive activities, initiated with Trust income, have been unsuccessful until now. Perhaps most importantly, income is largely banked, and does not necessarily benefit households at present. This restricts the project's contribution to rural livelihoods. While the review shows that a lot remains to be done, Jones rightfully stresses that CBNRM projects should be given time and space to make and learn from mistakes. Jones further recommends that communities be given exclusive land use rights, which would entitle them to use all land-based resources.

Start box

Some findings on the Chobe Enclave Community Trust (CECT) project

1. CBNRM is currently a windfall of revenues to communities. The windfall is caused by the delegation of the wildlife user rights to communities for free;

2. Revenues have risen sharply form $ 4 800 in 1993 to $ 196 303 in 2002. The reasons for the increase are:
   - Successful tendering of the hunting rights;
   - Inclusion of elephants in the hunting quota; and
   - Proximity to Chobe National Park.

3. No data are available about the costs incurred by CECT, and hence it is difficult to assess the long-term viability. Some observations:
   - 15% of the revenues are spent on operational expenditures of CECT. The remaining 85% is evenly distributed among the five Village Trust Committees (VTC);
   - Most revenues are kept in a savings accounts due to uncertainties about future revenues, lack of success of productive activities started by VTCs and lack of investment skills among communities and external agencies that assist; and
   - Revenue banking reduces the direct benefits to households, and is likely to adversely influence people's attitudes towards CBNRM. There is need to balance banking with addressing basic needs of the local population.

4. The large savings accounts, lack of insights in costs and the limited distribution of benefits affect the goodwill of the project among the local population and government personnel. An

inclusive and transparent approach is needed together with a stronger economic orientation of CECT. In the end, CECT and its activities need to be economically viable.

Source: based on Jones, 2002.

End of box

Wildlife and Rural Livelihoods

According to Ellis (2001), poor people focus their activities on improving their living standards as well as on increasing livelihood security. The former implies that people are able to meet an increasing portion of their basic needs. The latter means that fluctuations in living standards, for example due to drought, become smaller. People become less vulnerable as their security increases. Livelihood security can be improved by engaging in a variety of activities (diversification) that contribute towards livelihoods and by building up assets that strengthen and sustain livelihoods. Wildlife, in particular through CBNRM projects, has the ability to improve living standards as well as livelihood security.

Most people living in WMAs are very poor, and derive their livelihood from a mixture of activities including gathering, wildlife, agriculture and employment, often outside the WMA. Many depend on government assistance. There is currently no single high-yielding source of income, and multiple activities are used to increase livelihood security. However, the level of living standards remains very low.

The direct contribution of consumptive wildlife utilisation to rural livelihoods has decreased over the past decades. The net benefits from wildlife have declined due to both rising costs associated with wildlife and declining benefits. Bakane (1996) found that in communal areas close to the northern Tuli Block the costs of wildlife exceeded the benefits, leading to a negative attitude towards wildlife (see table below). The reasons for a decrease in wildlife benefits include the lower wildlife numbers and reduced resource access due to lower quota and license requirements that were introduced to prevent over-hunting. Moreover, costs of wildlife have increased due to growing conflicts between wildlife and agriculture, and because of the extra efforts required for hunting. It is therefore not surprising that many rural people now consider wildlife as a threat to their livelihood rather than as a source of livelihood.

Perceived trends in costs and benefits of wildlife utilisation by rural population

Trends in benefits	Trends in costs
Less food due to a decline in wildlife resources and resulting hunting quota reductions	Increased costs of hunting (extra time, transport)
Growing employment opportunities in tourism	Increased crop damage and livestock predation
	Growing health risk and scare for human beings
	Growing competition with people's livestock for water and grazing

Sources: expanded from Bakane, 1996 and Mbututu, 2001.

The CBNRM approach attempts to reverse this disturbing trend by increasing wildlife benefits for local people and by controlling the costs. While wildlife resources remain state-owned, the user rights are delegated to local communities. This offers opportunities to:

- Determine the use of wildlife;
- Control the distribution of wildlife benefits;
- Minimise the costs of wildlife and ensure that affected parties are compensated;
- Manage wildlife resources at the local level; and
- Acquire productive assets, initially wildlife resources.

The expectation is that through CBNRM people increase their net benefits and improve their livelihood. This would increase popular interest in wildlife conservation, particularly in high potential areas, and in areas with few alternative livelihood options.

Livelihood benefits are adversely affected if the community rights are not secure or transparent. Factors that determine transparency and security include the period over which the rights are obtained, the specification of entitlements under these rights and the quotas. If the community rights are not secure, it is unlikely that private sector parties can be interested in joint ventures. They are certainly unlikely to offer a high price.

Possible changes in quota affect the direct value of the user rights, and hence the community benefits. ULG (2001) has estimated that the ban on lion hunting costs the commercial hunting sector around $1.3 million in gross revenues. This leads to a drop in community revenues of $200.000 per annum, as community payments constitute 15.9% of the sector's expenditures. It is obviously important that quotas reflect the need to conserve wildlife resources, but they should also take into account the viability of CBNRM projects (especially in the western part of Botswana). There is a potential conflict between wildlife conservation and the short-term viability of CBNRM projects.

Encouraging an Economic View on Wildlife and CBNRM

The value of a natural resource needs to be properly assessed and understood in order to appreciate it. Wildlife and CBNRM projects are no exceptions. The value of natural resources is generally poorly reflected in resource prices. In many instances, resources do not have a market price or the price is too low. A resource such as water may be extremely valuable, but have a low price. In contrast, a resource such as diamonds has a relatively high price, but a low value. This apparent contradiction is known as the 'value paradox'. Attributing the right price to a natural resource is vital if you want to fully exploit the benefits of the resource.

To encourage an economic view on wildlife and CBNRM in Botswana we present below three useful concepts of resource valuation, and explain their differences and linkages. These concepts are the resource value, the resource price, and the resource rent.

The economic value of wildlife

Wildlife directly contributes to livelihoods and the derived value is called the *direct use value*. The direct use value is most important to the poor and it is the main determinant of people's attitude towards wildlife. The more livelihood benefits are obtained (or the higher the user value), the more wildlife is appreciated. If wildlife does not generate benefits or the benefits do not reach the rural population (for example due to a skewed distribution of the direct use value), people are unlikely to appreciate and conserve the resource. While the direct use value is a key component of resource utilisation and management, it is important to realise that the value of natural resources exceeds the direct use value. Other resource value components are incorporated in the concept of the Total Economic Value or TEV. The TEV of wildlife comprises the following elements (see for example, NCSA, 1998):

- The *direct use value* as reflected in current wildlife uses. While traditionally subsistence hunting was the major form of wildlife utilisation outside Parks and Reserves, a mixture of subsistence and commercial hunting as well as photo-safaris has emerged during the 1990s, particularly in northern Botswana. In Parks and Reserves, the direct use value is exclusively derived from photo-safaris;

- The *indirect use value*. Such values do not benefit people directly, but refer to key ecological functions of wildlife. An example of indirect use value of wildlife might be the role of elephants in the regeneration of mukusi and mukwa in the northern Forest Reserves;

- The *option value* refers to potential future resource uses and the perceived value of preserving the resource for these. A decline in wildlife resources may limit future use options. Rural people sometimes indicate that they wish to conserve local wildlife resources for their children to see and use. This option would become impossible if the resource is depleted; and

- The *existence value* refers to the perceived value of the mere existence of wildlife irrespective of their use by human beings. The existence value is particularly high for endangered species such as rhinoceros, which the global community seeks to preserve at high costs, even though many people may never see or use the resource. Land allocation for Parks and Reserves by national government and donor contributions towards wildlife management could be considered as a reflection of the existence value. The larger the land allocation or the larger the contribution, the higher the existence value.

The option and existence values are often referred to as preservation values as they imply resource preservation.

For the poor people living in WMAs, the direct use value of wildlife is most important. However for the country at large, the other value components are equally important. Therefore, government through its Department of Wildlife and National Parks needs to ensure that these value components are known – if only in a qualitative sense - and incorporated into WMA management plans.

The recent World Summit on Sustainable Development has tasked planners, the private sector and communities with designing and implementing a development scenario that offers a balance between meeting the present needs of the poor and retaining sufficient opportunities for future generations to satisfy their needs. This implies that the direct use value accruing to the poor needs to be increased while the option value needs to be kept sufficiently high to ensure a livelihood for the future generations. The community-roots of CBNRM put the approach in a better position than most traditional development approaches to achieve this objective.

Standard methods exist for the estimation of the value of wildlife. The direct use value is most frequently assessed as it is a priority and relatively easy. The example of the Kgalagadi North WMA is given in the next chapter.

The use value can be assessed from different perspectives such as private users (financial use value) and society at large (economic use value). The use value can be assessed by using market prices, prices of substitutes or by estimating the travel costs associated with using the wildlife resource (often used for tourism). Prices may differ for the assessment of the private use value (mostly market prices) and economic use values (e.g. shadow prices). The willingness-to-pay method can be used to estimate the total economic value of wildlife resources. An example of applying this method in KD2 (Zutshwa) will be given in the one but last chapter. The choice of valuation method primarily depends on the time and financial resources available[2].

The concept of Total Economic Value (TEV) has at least two important merits:

- It recognises that natural resources derive value from use as well as from non-use by human beings; and

- It recognises that the current value should incorporate the options of present as well as future generations. In this way the concept is closely linked to the sustainable development (and CBNRM) approach.

It is important for communities to regularly consider the value that they attach to wildlife resources (e.g. by species, subsistence and commercial use and by TEV component). In addition, communities need to consider how these values can be fully exploited and maintained. WMA plans need to have a strategy for capturing option and existence values of wildlife resources as income or grants for rural communities. The results can be part of the management plan and be used to evaluate joint venture bids.

The price of wildlife

Most economic goods have a market price. However, many natural resources do not have a market price, based on demand and supply factors, and they are often available for free. Wildlife resources are not for free, but government and commercial wildlife companies determine their price. Hunting license fees and entrance fees for National Parks are examples of government-set prices. Safari companies determine their own charges for the use of their services (on top of the government charges). Market forces have become more important during the 1990s with the introduction of tendering of tourism concession in Botswana, and wildlife auctions of live animals in South Africa. Market forces will be further strengthened in Botswana with the expected development of a commercial game ranching sector after the adoption of the 2002 Game Ranching Policy (Government of Botswana, 2002).

Wildlife "prices" depend on factors such as:

- Price setting. Who determines the price and what criteria are used? Government prices tend to be lower than those of the commercial sector and are less frequently adjusted.

[2] See for a description of valuation methods the Planning Officers' Manual (Ministry of Finance and Development Planning, 1996). As part of the Environmental Planning Project, revisions to the manual have been proposed to include more environmental-economic concerns into the planning manual. These revisions are currently incorporated into a new edition of the manual.

Botswana's park fees are reviewed from time to time; they are higher than those of other Southern African countries. In contrast, hunting license fees have been very low for a long time until their recent increase in October 2001; and

- The type of product. For example, the price of a day visit to a National Park is P 10/day for citizens and P 50/day for foreigners. The price of a springbok hunting license is P 150 for citizens and P 400 for foreigners.

In Botswana, government charges a hunting license fee for the right to hunt a wild animal. In addition, leisure hunters have to pay extra to communities (in community controlled areas) and/or to commercial hunting companies. These 'extras' are substantial, and are often payable in US$ in advance. First the hunter has to buy the animal from the concessionaire (trophy fee) and secondly has to pay a daily rate. For example, one Botswana-based safari company offers different types of hunts. The company's daily rate charge for the cheapest hunt of small antelopes only is US$ 400/day and US$ 300 for observers with a minimum stay of seven days. The most expensive hunt ('the big four') costs US$ 1500/day for a minimum stay of 30 days. These charges cover the costs of a professional guide, accommodation, food, transport and a profit for the operators. Hunting fees and charges vary considerably from species to species. The large range in fees is an expression of the scarcity of certain species and hunters' preferences.

The table below summarises several wildlife prices in Botswana and neighbouring countries. As they cover different forms of wildlife utilisation, they are difficult to compare. However, it is striking that there are enormous differences in charges for species between countries. No single country is the cheapest or most expensive for all species. This suggests that market forces appear to have a limited impact on price setting at present, and have not led to competitive markets. Such a situation usually leads to non-economic resource use and wastage. It would also indicate that there are opportunities for expansion of the commercial wildlife industry.

Competitive markets require:

- Comprehensive information among all consumers and suppliers;
- A large number of suppliers and consumers; and
- Secure and exclusive resource rights of suppliers.

There is need to analyse national and regional price trends and settings in different wildlife sectors in more detail. This is particularly important for the emerging game ranching industry in Botswana and communities that seek to participate in this sector.

Examples of different wildlife prices by species (in Pula).

	Hunting charges on private farms in Namibia	Hunting charges on private farms in South Africa	Botswana license fees for free range hunting (non-residents)	Auction value South Africa
Eland	7 200	2 100	2500	1084
Gemsbok			2500	2241
Hartebeest	2 400	1 800	1000	2153
Impala	2 700		500	1026
Kudu	3 600	2 100	1000	465
Wildebeest	5 400	1 950	2500	1447
Springbok	1 800		400	
Zebra	3 300	1 950	5000	2467
Lion			10000	2325 (2000 figure)

Notes: South African auction prices are May 2002 averages. The auctioned animals are usually not trophy animals. Hunting fees on private farms cover hunting, accommodation, food and some drinks. The package on offer varies by farm. Namibia figures are a rough average based on six farms; South African figures are based on two farms. In Namibia, additional daily charges exists for hunters (US$ 160 to 230 for 1 hunter; 130 to 175 for 2 hunters) and observers (US$ 70). To be able to hunt in Botswana one needs to pay for the animal and a daily rate on top of the above mentioned licence fees. Daily rates vary greatly per company and per species.

Sources: Botswana Government Gazette, web sites of safari companies and Wild en Jag, July 2002.

South Africa has gained experiences with wildlife auctions. The sales at South African wildlife auctions have rapidly increased during the 1990s. The number of animals sold has more than doubled from 8 292 in 1991 to 17 702 in 2000. The value of the sales increased by over 600%. Sales in 1991 were estimated at 9 million Rand and increased to 63 million Rand in 2000. The most popular species include blue wildebeest, springbok, gemsbok, kudu, eland, red hartebeest and zebra (Wild en Jag, February 2001). The boom in wildlife auctions reflects the rapid growth of the wildlife industry in South Africa. Animals are purchased for restocking as well as for the establishment of new wildlife operations. With the new Game Ranching Policy, the establishment of wildlife auctions in Botswana may become feasible. Such auctions could offer additional income-generating opportunities for CBNRM projects.

Resource pricing needs to take into account social considerations too. Free use of wildlife may be justified if it benefits the poorest or aims to boost community development. This argument does, however, not apply to recreational hunting. It must also be realised that free use of wildlife for social reasons may lead to wildlife wastage and creates opportunities for abuse (e.g. illegal sale of licenses). For proper resource pricing, it is important to know the resource value and to aim for resource prices as closely as possible to the value. Exceptions should then be based on equity and sustainability considerations.

Communities need to know what the 'going' prices of different wildlife uses are. This is necessary to:

- Fully exploit the benefits of their wildlife resources. The tendering of rights has proven very useful to maximise revenues (Jones, 2002); and
- Deal with competitors. For example, growth of game ranching on private land will have an impact on CBNRM projects in communal areas. It is necessary to anticipate likely developments in the game ranching industry. Which threats and new opportunities emerge? Which implications does this development have for the existing WMA-plans and activities? Does the new policy offer communities new opportunities, for example to team up with game ranchers directly?

Resource rent

The resource rent is closely linked to the resource price, but covers two additional aspects:

- The costs of resource utilisation; and
- The distribution of the net benefits.

The inclusion of the costs of resource use and the distribution of the net benefits makes the concept essential for resource management and stakeholders. The resource rent is essentially the difference between the resource revenues (amount x price) minus the costs of utilisation and a reasonable return to one's inputs or capital (labour and finance). Resource users normally try to maximise the rent by maximising the revenues and minimising the costs. The resource rent may be compared with a cake: the larger the rent (or the bigger the cake), the larger the benefits to development of stakeholders. However, the development benefits are also determined by the distribution of the rent (the slices of the cake). In case of CBNRM the rent is distributed among the government, local communities and safari companies.

Prior to the establishment of CBNRM-projects, the resource rent was divided between the government and the wildlife user. Government secured its part of the rent through set fees. As fees used to be very low, the bulk of the rent accrued to wildlife users, i.e. the safari companies. After the introduction of community wildlife utilisation rights, three groups of stakeholders exist:

- Communities managing wildlife;
- Wildlife users (companies and individuals; hunting and photo safaris); and
- Central and local government (e.g. Ministries, Councils and Land Boards).

We can assume that communities seek to maximise their share of the rent. This can be done by seeking direct and indirect benefits, and by minimising conflicts between wildlife and other livelihood sources. To maximise their benefits from the resource rent, communities need to maximise the resource rent of wildlife, maximise the communities' share and ensure a fair distribution of the benefits within the communities.

Figure 2 gives a hypothetical example of the use of the concept of resource rent. In a certain WMA, the realised rent of wildlife was P 260 000 in 1990, mostly from hunting. In 2002, the rent had increased to P 400 000 due to the introduction of non-hunting tourism. In 1998 the local communities were granted wildlife user rights. The communities decided to seek bids for part of the wildlife rights. As a result, the communities increased its benefits substantially from P 10 000 (mostly special game licenses) to P 150 000 (a combination of hunting and sub-leased community quota). Revenues of government related institutions also increased (fees and levies). The commercial users had to surrender part of the resource rent in absolute and relative terms. Nonetheless, the share remains sufficiently attractive to continue business.

Government and communities should use the resource rent concept for the development of their wildlife management plans. A shared goal of all stakeholders would be to increase the resource rent. Possibilities include:

- Increase the commercial use of wildlife;
- Increase wildlife resources;
- Promotion of joint ventures between communities and private companies;
- Processing of wildlife-based products (e.g. biltong); and
- Cost minimisation by efficient management.

The government and communities themselves are interested in increasing the wildlife benefits to communities. Possibilities include:

- Improve the security of community wildlife user rights;
- Tender or auction community rights;
- Employment guarantees and meat supply for the local population by safari operators; and
- Enhanced community assets (e.g. training, management), and growing participation of communities in joint ventures.

To ensure that rural livelihoods indeed improve, it is important that the community benefits are distributed in a transparent, fair and accountable manner. There is need to:

- Set ceilings for the operational costs of trusts;
- Ensure compensation for households that have been negatively affected by wildlife; and
- Specify the distribution of benefits to community projects and benefits to individual households, and in terms of investments and consumptive destinations. Increasing consumptive household benefits could mitigate adverse livelihood impacts from droughts and HIV/AIDS.

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The Economic Viability of Wildlife Use Options in Botswana

Barnes (1991, 1996, 1998 and 2001) has done extensive research on the viability of different wildlife activities in the communal areas of Botswana. The following wildlife options were considered:

- Game farming and ranching run by individuals or groups; and
- Community-based wildlife utilisation (unfenced).

The costs and benefits of each option have been assessed though a cost-benefit analysis (CBA) from two different perspectives. Firstly, financial CBAs were done to assess the costs and benefits of the activity for the wildlife user (individual, community or company). The financial CBA informs the user/investor whether the planned wildlife activity is viable or not. Secondly, economic CBAs were carried out to determine whether the wildlife use contributes to the country's development or not. In this case, the costs and benefits to society are listed and valued. These may differ from those of the users/investors. For example, subsidies do not feature in an economic CBA but do appear as a benefit in the financial CBA. Also tax payments are a financial cost but not an economic cost or benefit.

Cost-benefit analysis is an economic efficiency analysis which results are summarised in ratios such as:

- The Net Present Value (NPV): this is a measure of the discounted benefits minus the costs. If the NPV is positive, the option or project is viable because the benefits exceed the costs. The project is not viable if the NPV is negative;
- The Internal Rate of Return (IRR). The IRR indicates the discount rate at which the benefits and costs are equal. The option is viable if the IRR exceeds a percentage of return that is set by the investor (financial) or the government (economic).

In the absence of empirical data at that time, Barnes frequently had to make assumptions about the costs and benefits. Therefore, the calculations refer to a "model" or "average" farm that may not be found in reality. As said above, it is now time (and possible) to carry out economic analysis of existing CBNRM projects and game farms.

Results to date show that game ranching and farming have relatively poor economic and financial returns in most parts of the country. This is largely due to the low densities of wildlife resources and to the high capital costs of fencing and restocking (Coneybeare and Rozemeijer, 1991; Barnes, 1998). The potential returns may display an overtly optimistic picture as in practice management problems prevent these returns to be achieved. Other viability constraints include the poor domestic market and bureaucratic obstacles.

Barnes (1998) estimated the Net Present Value (NPV) of game farming in the Kgalagadi. The results are summarised in the table below. As investors have a choice between game and cattle farming, the viability of cattle farming was added. Using the Net Present Value (NPV) as the viability indicator, no form of farming is financially viable in the Kgalagadi. This reflects the harsh environmental circumstances, but it also raises the question as to why people start new farms. The answer may be that farmers derive benefits other than those incorporated in the cost-benefit analysis and that some of the assumptions may not apply. From society's perspective, only game farming is viable, but the returns remain marginal (P 59 000 over ten years). Barnes advances several reasons for this:

- Lack of high value species (financial and economic returns are boosted by species such as elephant, lion and buffalo);
- Low wildlife density (re-stocking is expensive and reduces the economic viability); and
- Poor domestic market and export barriers.

Economic viability of game and cattle farming in the Kgalagadi (figures in Pula)

	Cattle farm with subsidies	Cattle farm without subsidies	Game farm without subsidies
Financial NPV	- 159 000	-512 000	- 399 999
Economic NPV	- 272 000	-272 000	+ 59 000
Financial IRR	+ 8.8%	+ 2.0%	+ 5.9%
Economic IRR	+ 2.3%	+ 2.3%	+ 6.6%

Note: NPV is calculated over ten years; the financial discount rate is 12%; economic discount rate is 6%.

Source: Barnes, 1998.

Using the financial Rate of Return, cattle farming is the most viable option at present (IRR of 8.8%) due to the livestock subsidies. Without livestock subsidies, game ranching is more attractive (IRR of 5.9%), presumably due to the comparative advantages of wildlife in western Botswana.

Recently, the economic returns of different livestock and wildlife production systems were assessed for Ngamiland (Barnes et al., 2001b). Three livestock systems were assessed (traditional small-scale livestock production, large-scale cattle post production and commercial livestock production) and three wildlife utilisation systems (CBNRM in low and in high quality areas and commercial tourism).

The assessment showed that commercial livestock production is not economically viable in Ngamiland due to poor herd performance and the long distance to the main markets that reduces the real product value to 68% of the national average (Barnes et al., 2001, p.39). The main results for the other production options are summarised in the table below. The economic returns of wildlife systems are generally higher than those of livestock production. The comparative advantage of wildlife is derived from the available wildlife resources as well as the long distance to livestock markets. Small-scale traditional livestock production has the highest returns in Ngamiland from an individual user perspective, presumably because of its emphasis on multiple products and limited reliance on sales. There is a big gap between wildlife performance from the financial (investor's) and economic (society's) perspective. Both are positive, but the economic analysis shows considerably higher returns. Interestingly, the community benefits are highest from commercial tourism, mostly in the form of local wages and royalty payments. This implies that communities can increase their benefits by entering into joint ventures with commercial tourist operators.

Economic returns of livestock and wildlife systems in Ngamiland (figures in Pula)

	Small-scale traditional livestock production	Large-scale cattle post livestock production	CBNRM in low wildlife quality areas	CBNRM in high wildlife quality areas	Commercial tourism
I. Financial analysis					
IRR	11.5%	6.8%	8.0%	8.1%	9.6%
NPV (Pula)	381	- 52 846	3 466	20 302	229 517
NPV/ha (P/ha)	52	- 8	0.00	0.25	15.94
II. Economic analysis					
IRR	10.1%	2.0%	24.8%	54.1%	64.0%
NPV (Pula)	4 679	-235 621	1.8 million	2.9 million	6.6 million
NPV (P/ha)	26	- 37	3.00	36	457

Source: Barnes et al., 2001b.

In view of these results, Barnes advises wildlife operations to restrict capital expenditures and to concentrate efforts on 'high potential zones' with:

- Sufficient high-value species;
- A sufficient wildlife density;
- Low population and cattle density; and
- Good accessibility to the main tourism markets.

Livestock production should concentrate on areas with proper market access and few / unattractive wildlife resources. The wildlife high potential zones include the Tuli block, Ngamiland and Chobe. There may be a potential elsewhere adjacent to National Parks, which could serve as tourist magnets and resource regeneration pools. The Gemsbok Transfrontier Park is a good example. More may emerge with the continued improvements in road and communication infrastructure.

The marginal viability of wildlife activities in the Kgalagadi puts pressure on the hunting quota. The increase of quota and incorporation of rare species improve the viability of wildlife activities tremendously. Therefore, short-term conflicts arise between maintaining the viability of wildlife activities and conserving wildlife resources. Therefore, there is need for a well-founded, transparent and secure system of quota setting and allocation to ensure economic and environmental sustainability.

Comparing the viability of hunting and non-consumptive tourism, Barnes (2001) argues that the economic benefits of the latter exceed those of the former. Therefore, non-consumptive tourism should be given more priority as it has long been neglected. Through the Eco-tourism Strategy and other tourism initiatives, the potential of non-consumptive tourism needs to be fully exploited, particularly in high potential areas such as the Okavango and Chobe. Elsewhere, the potential of non-consumptive use is limited while commercial hunting may be viable. Limited, intensive ostrich and crocodile farming also have a potential for further development. A more diverse use of wildlife resources strengthens livelihoods and their security. For example, commercial hunting is more resilient to the recent regional and global political turmoil than photographic tourism.

CBNRM projects are most profitable in areas with low population density (as wildlife densities are highest in such areas; Bond, 1999). In Botswana, the CBNRM potential is evident in Ngamiland and Chobe as demonstrated by the highest prices paid for tendered wildlife rights. Both areas hold high value species and have the highest wildlife densities in Botswana. In the past, doubts have been expressed about the viability of CBNRM in western Botswana. Barnes (1998) concluded that CBNRM projects are *financially* non-viable in areas with a wildlife density of over 150 ha per large stock unit[3]. This could be referred to as the lower limit of the economic carrying capacity of wildlife. The *economic* viability is threatened with density of over 300 ha per LSU[4]. As the wildlife densities of much of western Botswana have dropped below these levels, CBNRM projects could be in jeopardy and future use values threatened (option value).

The successful tendering of KD1 in recent years has fortunately demonstrated that the wildlife potential may have been underestimated. Nonetheless, it is clear that a threshold exists for the viability of wildlife projects. Communities should be concerned about decreasing wildlife resources as it directly affects their pockets through CBNRM projects. The government needs to be concerned about declining wildlife numbers because of the loss of future development opportunities (option value), and the possible loss in the Total Economic Value (TEV) of wildlife. Therefore, wildlife conservation should be an important component in a WMA Management Plan. Barnes' analyses indicate that conservation measures would improve the viability of CBNRM

[3] A large stock unit (LSU) equivalent is the 'metabolic mass equivalent of a 450 kg. bovine steer or ox (Barnes, 1998, p. 66). It is the same as the better-known measure of LiveStock Unit used for livestock conversions.

[4] These threshold levels are indicative generalisations. The table on the impact of wildlife conservation strategies shows that the *financial* viability in the Kgalagadi is under threat if the wildlife density drops to 160 and more ha/ LSU; the *economic* viability is threatened when wildlife densities drop to 200 and more ha/LSU.

projects as shown in the table below. A combination of a hunting ban and partial game cropping would lead to wildlife recovery and improve the economic viability of CBNRM projects.

The impact of wildlife conservation strategies on the economic viability of CBNRM projects in selected Controlled Hunting Areas

CHA	Wildlife density (ha/ large stock unit)	Strategy 1 [a]: Partial game cropping moratorium for 9 years	Strategy 2 [b]: 3 year cropping ban followed by 6 years of selective cropping
Financial NPV			
KD 1	105	2 987 000 or P 2.40/ha	5 239 000 or P 4.20/ha
KD 2	209	-2 452 000	- 812 000
KD12	103	1 144 000 0r P 1.14/ha	3 636 000 or P 3.61/ha
KD15	161	-1 755 000	- 92 000
Economic NPV			
KD 1	105	813 200 or P 6.52/ha	8 768 000 or P 7.03/ha
KD 2	209	- 181 000	827 000 or P 1.14/ha
KD12	103	4 875 000 or P 4.85/ha	6 419 000 or P 6.38/ha
KD15	161	758 000 or P 0.98/ha	1 746 000 or P 2.25/ha

Note: Financial NPV indicates the net discounted benefits for the wildlife user; the economic NPV indicates the net discounted benefits to society.

[a] : no off-take for eland, wildebeest and hartebeest; maximum sustainable off-take for other species

[b] : no off-take for eland, wildebeest and hartebeest; 75% of sustainable off-take for other species.

Source: Barnes, 1998.

Barnes (1998) concludes that CBNRM projects in western Botswana need to be accompanied by wildlife protection strategies. This constitutes another reason for a carefully designed and implemented quota setting policy.

CBNRM projects could benefit from insights gained in the commercial sector. Recently, an economic analysis of the commercial hunting sector in Botswana was carried out by ULG (2001). Its main economic findings are summarised in the box below. The ULG-study has at least two lessons for CBNRM projects. Firstly, communities will have to raise their marketing expenditures if they want to exploit concessions alone. In this regard it would be more efficient to establish a joint marketing system for CBNRM projects in Botswana. It is important that communities market their strengths in comparison to commercial operators (e.g. cultural and traditional aspects, large tracts of communal land). Secondly, communities and CBNRM projects need to review the implications of the expected growth in the freehold and leasehold game ranching sector. While competition for business may increase, new opportunities for collaboration may also arise. The demand for joint ventures with communities may increase as this is a way for game ranchers to keep access to the vast, unfenced, communal wildlife areas. The Namibia experience shows that the game ranching industry has enhanced the value of communal land concessions, indicating that CBNRM projects and game ranching industry are complementary rather than competitive (pers. comm. Barnes).

Start box

Some findings of the ULG-study on Botswana's commercial hunting sector

ULG carried out a review of Botswana's commercial hunting sector using empirical data, interviews and literature. Models were developed for individual concessions and for the country at large. The Botswana Wildlife Management Association (BWMA) commissioned the study.

The findings include:

- The sector generated a gross income of US$ 12.5 mln. in 2000 (Pula 60 mln at that time);
- Daily rates and trophy fees are the main sources of income (46.6% and 34.9% of total revenues);
- Elephants account for over half of the license and trophy income (56.2%). Other important species include buffalo (6.5%), leopards (6.6%) and lion (4.7%);
- The main expenditure categories are (in descending order of importance): agents' commission (23%), payment for input services (22.9%), payments to government (15.7% and to communities (15.7%);
- Marketing of commercial hunting is costly (almost a quarter of the total costs);
- The system of tourism concession system has successfully raised the revenues of government and communities (30.8% of total expenditures of the sector;
- Almost half of the expenditures benefit the local economy (49.5%). The balance is spent elsewhere in the country (25.7%) or abroad (24.8%). This finding contradicts the widely held view that most benefits do not reach the country;
- The moratorium on lion hunting and restrictions on elephant hunting in some areas cost the sector US$ 1.3 and 1.6 million respectively, or 22.8% of the gross income;
- The Zimbabwe experience shows that commercial hunting is more resilient to political turmoil than photo safari business; and
- There is a possibility that the forthcoming Game Ranching Regulations will offer advantages to plains game hunting on freehold and leasehold ranches. This could affect operations of CBNRM projects in remote areas that rely on these species (Kgalagadi, Ghanzi, Southern and Kweneng).

Source: based on ULG, 2000.

End of box

CBNRM projects have the potential to generate "viable" additional benefits, some of which are immaterial and most of which are difficult to quantify. These benefits are often labelled intangible, and have not been incorporated in the above cost-benefit analysis. Their inclusion would lead to a more positive *economic* (not *financial*) assessment of the projects. Several intangible benefits may be critical to the successful implementation of the revised Rural Development Policy. CBNRM projects are a good tool to access donor funds, and therefore strengthen access to financial capital. For Namibia's conservancies, Barnes (2001) considers donor funding as a reflection of non-use value of wildlife resources. Intangible benefits include the following (Rozemeijer ed., 2001; Barnes, et al., 2001):

- Building up of representative community structures that can benefit other rural development efforts;
- Strengthening of the community identity and culture;
- Community empowerment and control over local development;
- Reversal of the trend towards growing dependency of rural people on government;
- Skill development and increased accountability;
- Greater livelihood security through economic diversification and improved drought coping capacity; and
- Retaining productive and educated youth in rural areas by offering employment opportunities.

The above cost-benefit analyses do not examine the distribution of the net benefits (economic rent). It is important that communities consider this aspect and gain insight in the benefits of other stakeholders, and consider a fair distribution of benefits within the communities.

Comparing Wildlife Utilisation with Livestock Production

Comparing the direct use value/hectare of wildlife activities with that of livestock production in communal rangelands can also assess the economic viability of wildlife activities. Amusa (2000) has done this in northern Kgalagadi district for the period 1980-1990. She compared the annual direct use value of livestock dominated rangelands (LDAs) with that of Wildlife Management Areas (WMAs). The reviewed LDAs surround the Matsheng villages and Kang; the WMAs are located further away from these settlements (see Figure 3). In order to eradicate poverty and achieve other aspirations of Vision 2016, it is important to boost the use value of WMAs. Given the low population densities in WMAs, the direct use value per hectare does not necessarily have to be very high. It is, however, essential that the wildlife benefits make a significant contribution to local livelihoods.

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The estimate of the use value covered the following products:

- Livestock: meat, cash, milk, herd growth, manure and draught power;
- Wildlife: hunting based on single game licenses. Photo safaris were not common during the period for which data were available (1980-1990), and were therefore excluded; and
- Gathering: fruits, vegetables, medicines and building material.

The estimates are based on existing statistics from Agricultural Statistics, Farm Management Surveys, hunting quota from the Department of Wildlife and National Parks and the National Accounts. The use values of LDAs and WMAs were estimated separately. For the period 1980-1987, the average annual direct use value for Botswana's communal areas is P5.26/ha in constant 1990 prices. In the Kgalagadi North, LDAs have a higher average use value than WMAs (P 4.46 and P 2.72/ ha respectively).

The original analysis refers to the 1980s when there was a drought and when commercial wildlife utilisation was not yet introduced in the area. The development of commercial wildlife activities in the 1990s has increased the direct use value of WMAs. Payment to community trust in KD1 in the late 1990s represented a value of around P 0.25/ ha (current prices). Other 'new' benefits include the transfer of half the game meat to the communities (valued at around P 45 000 per annum), wages from employment and the sale of crafts and veld products. The potential impact of wildlife utilisation on rural livelihoods is therefore significant (see box below).

The low average use value found for the Kgalagadi North (compared with the national average) reflects the below average rainfall and the associated low resource productivity. The reasons for the lower direct use value of WMAs as compared to LDAs are more complex. The most plausible reasons are that the population density of WMAs was extremely low, and that wildlife was only used for subsistence purposes at that time. Consequently, the WMAs had very low resource extraction. The decline in wildlife resources may be another reason. The drop in numbers has led

to a decrease in hunting quota and use value. This process was accelerated by the particularly sharp drop in quotas of migrating species such as wildebeest and hartebeest. The findings confirm that a sufficient wildlife density and the presence of high value species are essential for a high use value based on hunting. In the short term, a conflict exists between the need to maintain sufficiently high hunting quota to maintain CBNRM viability on the one hand and wildlife conservation on the other hand. In the long term, the interest of both coincides as the viability of activities depends on sufficient wildlife resources.

The annual use figures discussed above should be interpreted with caution as the LDA figures are expected to be over-estimates and those of WMAs under-estimates. Cattle are found deep inside WMAs, and therefore their use value cannot be solely attributed to LDAs (van der Jagt, 1995; Kgabung, 1999). Moreover, milking appears less common in the Kgalagadi than assumed in the estimate, and therefore the milk output is probably overstated. In contrast, the annual use value of WMAs is expected to be an underestimate, as it did not include special game licenses. As no time series data were available for special game licenses, they could not be included. Incorporation of these licenses could increase the use value by a factor two to three. This could lead to a use value that exceeds that of LDAs.

The potential of CBNRM to improve rural livelihoods is demonstrated by the experience of KD1. The joint venture between the trust and the company raised almost P 300 000 per annum, provided employment and game meat for local communities. The project has the potential to increase incomes significantly (see box below).

Start box

Poverty and the CBNRM potential in the Kgalagadi North

- Family incomes are extremely low in remote area settlements in the Kgalagadi North. Van der Jagt (1995) estimated the average monthly household income at Pula 183 in 1995. Assuming that incomes have risen in line with inflation, the average monthly income of households would be P 289 in 2001.
- The Poverty Datum Line (PDL) for a family of seven (average size in Kgalagadi north settlements) was estimated to be P 347.17 in 1989. Taking into account inflation, the PDL for the same household would be P 701.15 in 1995 and P 1110.26 in 2001.
- The average household income is just over a quarter of the PDL. In other words, on average only a quarter of the basic needs can be met. Poverty is widespread and intense.
- In KD1, community revenues from a joint venture with a safari company amount to around P 300 000. This equals around P 250/household/month or 87% of the estimated average household income or 23% of the estimated PDL. The community revenues may be modest in absolute terms, but highly significant in proportion to local incomes and basic needs.
- The local population derives other benefits: employment opportunities for over half of the households and half of the game meat of animals shot by commercial hunters.

Sources: van der Jagt, 1995; CSO, 1991. Inflation rate: Bank of Botswana.

End box

Given the above, it would be unwise and premature to conclude that WMAs are necessarily less productive than LDAs. However it is clear that subsistence hunting does not generate sufficient use value to significantly improve livelihood security and eradicate poverty. Therefore, complementary development options have to be identified such as:

- Increased use value of wildlife by promoting commercial wildlife and wildlife-based activities. Such activities include trophy hunting and photo safaris. The improvements in the infrastructure, the proximity of the transfrontier Gemsbok Park and the establishment of a northern access gate offer opportunities for commercial wildlife development; and
- Controlled development of non-wildlife resource uses such as crop production, livestock rearing and use of veld products.

Comparing Different Land Use Options of WMAs

The limited potential of WMAs to generate adequate livelihood sources for residents and the demand for grazing land by livestock owners from outside WMAs could be reasons to reconsider the designation of WMAs. Amusa (2000) examined the options of WMA residents (Zutshwa in KD2) and outsiders (Tshane). Using the Willingness-To-Pay method, the study reviewed the merits of different land-use options. Beneficiaries were asked their Willingness-To-Pay for each option that benefits them; affected parties were asked their Willingness-To-Accept compensation. Three land-use options were considered:

- Option 1: Retaining the *status quo* with respect to the Wildlife Management Area (WMA) and Livestock Dominated Area (LDA);
- Option 2: Expansion of Tshane's LDA into Zutshwa's rangelands. This would be a benefit to Tshane livestock owners, whose Willingness-To-Pay was measured, and a loss to Zutshwa's residents, whose Willingness-To-Accept was calculated; and
- Option 3: Expansion of agricultural activities by Zutshwa residents in their 'own' area. This actually happens through the introduction of livestock by the District Council. Zutshwa residents' Willingness-To-Pay was measured.

Seventy residents of Tshane were interviewed –located in an LDA- and thirty respondents in Zutshwa –located in a WMA (Controlled Hunting Area KD2). Respondents were asked to give cash (annual payment) or in kind (value calculated as one time payment).

The results show that Zutshwa and Tshane residents prefer the present situation as it is given the highest value. In contrast, the opinions are strongly divided over the option to expand Tshane's LDA into the WMA. While the Tshane residents give this a high preference (because they benefit), Zutshwa residents strongly oppose such a move and claim high compensation for the loss. The compensation claimed by the Zutshwa residents exceeds the Willingness-To-Pay for such expansion by the Tshane residents. Therefore, this option is not suitable. The preference to maintain the *status quo* is probably due to the fact that the people have adapted their livelihood strategies to the present situation. Changes would bring winners but also losers, and therefore carry costs. It is possible that Tshane residents do not require substantial expansion of their grazing land. Possibly, KD2 is for many Tshane residents too far and keeping livestock would become too costly. KD2 natural resources form the key to the livelihoods of Zutshwa residents and therefore their preference to retain control makes sense. Below, each option is discussed in more detail.

Option 1: Maintaining the status quo
In Tshane, the *status quo* is retaining communal grazing (LDA). While communal rangelands are used free of charge, respondents are Willing-To-Pay for the benefit. Twenty-seven of the twenty-eight livestock owners were willing to pay in cash while twenty-three were willing to pay in kind. The average Willingness-To-Pay was P75 per household (in cash) and P200 in kind. As the Willingness-To-Pay in kind is a lump-sum payment, it is higher than the annual cash Willingness-To-Pay. Small cash payments are most popular.

As expected, cattle-owning households in Tshane exhibited a higher Willingness-To-Pay to retain the use of the communal rangelands than households without cattle. Female-headed households preferred to pay in cash rather than in kind, presumably because they own fewer livestock, which are normally used to pay in kind.

Retaining the use of the WMA is the *status quo* for Zutshwa residents. Virtually all households in Zutshwa were willing to pay for this. The average Willingness-To-Pay in cash per household was P 45. The average Willingness-To-Pay in kind was P150 per household.

The Willingness-To-Pay for the *status quo* in Zutshwa is lower than that in Tshane. This can be attributed to the very low household incomes in Zutshwa. Compared to the average Zutshwa income the Willingness-To-Pay is substantial. This is possibly due to the fact that loss of the WMA would have a severe impact on the livelihoods of the residents.

Option 2: Expansion of Tshane's communal livestock grazing area into Zutshwa WMA
The primary beneficiaries of this option are Tshane's livestock owners, who will be able to expand their herds and/or spread the grazing pressure over a larger area. Zutshwa residents will be disadvantaged as they loose access to part of their natural resources.

As expected only livestock owners in Tshane expressed a positive Willingness-To-Pay. Those without cattle did not expect any benefits from this option. The average Willingness-To-Pay of households was P20 in cash and P200 in kind, which is equivalent to the value of a goat. Owners of large herds were willing to pay more for the extension of communal grazing than owners of small herds. This makes sense, as large cattle owners would benefit most from this option.

Zutshwa residents would loose as a result of the extension of Tshane's communal livestock grazing area into their WMA. Therefore, they were asked about their Willingness-To-Accept compensation. Almost all households were willing to accept compensation. Their Willingness-To-Accept was high: in cash and in kind on average P600 and P850 per household respectively.

Option 3: Opening up of the wildlife management area for local livestock
This option would benefit local residents and not affect Tshane residents. The average Willingness-To-Pay was P25 per household in cash and P50 in kind. This value indicates that people seek and value supplementary sources of livelihood such as controlled agriculture.

Conclusions and Economic Issues

It has become clear that wildlife utilisation has the potential to increase the level and security of local livelihoods, particularly in high potential zones and in areas without livelihood alternatives. This is remarkable for a natural resource that has declined significantly since the 1980s, and this must be attributed primarily to the establishment of CBNRM projects. Tendering has been successful in raising the community benefits of wildlife projects. At present however, wildlife-based development is unable to meet all people's needs, let alone that it can bring about the rapid growth in incomes as envisaged under Vision 2016. The experience of KD1 – an area with low wildlife density - shows that wildlife revenues are substantial compared to average household incomes. However, in order to make a tangible impact on livelihoods, the distribution of CBNRM benefits is critical. This refers to the distribution of benefits from collective to individual/household and to the tension between current and future needs. The experience of CBNRM in Botswana today suggests that communities are struggling to find a balance.

It is critically important to increase the use value of WMAs on a sustainable basis. This value should be measured in terms of livelihood benefits as well as land productivity. The increase can be achieved by maximising the development benefits of wildlife, for example through commercialisation and the establishment of wildlife-based industries. It is almost certain that supplementary forms of livelihoods are needed to eradicate poverty in WMAs. Livelihood diversification can be achieved through developing suitable agricultural activities. Communities could benefit from intensified collaboration with the private sector in general and the emerging tourism sector on freehold and leasehold land in particular.

The short-term conflict between the economic viability of wildlife activities and wildlife conservation requires a careful and transparent implementation of the hunting quota-setting policy. Further, communities and companies need to have sufficient security of tenure to invest and reap benefits while the wildlife resources are being managed in a sustainable manner. Otherwise, investments will be diverted towards freehold and leasehold land. Botswana's comparative advantage (over Namibia, South Africa and Zimbabwe) of having large unfenced wildlife areas will in that case not be wisely exploited.

There is a general need to strengthen the economic analytical skills in government, NGOs and communities. There is also need to regularly review the economic performance of CBNRM projects.

Issues for resource economists

- Decentralisation of wildlife user rights has proven to be a direct and efficient way to increase revenues of local communities and to empower communities. It is an instrument particularly suited for communal areas, and therefore represents an African blend of development that empowers local communities;
- It is important that intangible benefits of CBNRM are incorporated in project appraisals and evaluations;
- Relatively modest monetary amounts in rural areas may be significant in livelihood terms, i.e. as a proportion of rural incomes;
- Threshold levels of wildlife densities exist below which the economic viability of projects becomes suspect. Wildlife conservation thus becomes an economic issue;
- There is need to regularly review wildlife prices and values both in Botswana and in Southern Africa;
- There is also need to consider the merits of strengthening market forces in the wildlife sector. Consideration needs to be given to privatisation of some National Parks (this could unlock private sector investments), and the potential benefits that surrounding communities may accrue. There may also be scope for a wildlife auction in Botswana; and
- There is a need to consider the impact of developments in other economic sectors (e.g. game ranching and livestock industry) on the viability of CBNRM projects, and consideration of mitigation measures.

Issues for communities

- Communities need to know the value of wildlife by species and by Total Economic Value component; this allows for capturing more income from the preservation value (i.e. option and existence values);
- Communities are struggling to convert the revenues into lasting benefits for households. Banking of wildlife revenues does not improve the livelihoods of the current population and is unlikely to change people's attitude towards wildlife resources. There is need to make sure that such revenues are fairly distributed to the benefit of the communities as well as individual households. Part of the revenues should be invested to sustain the wildlife resources.
- Livelihood improvement needs to be the overall long-term objective of Wildlife Management Area plans. Communities need to articulate a clear development vision and strategy that is not restricted to wildlife utilisation;
- There is need to give more emphasis to an economic approach towards CBNRM. This means comparing the costs and benefits of wildlife utilisation (vis-à-vis alternatives) and between different types of wildlife utilisation;
- Data for the commercial hunting sector show that marketing costs are high. Therefore communities need to be careful in developing strategies to market themselves if they want them to be effective and efficient. The merits of a joint marketing network for CBNRM communities need to be considered;
- Communities need to know what their income generating options from wildlife are, what the net benefits of each option are, and what competition exists or is emerging. This requires the availability of or access to economic skills and market information; and
- Community knowledge about resource value, prices and rent distribution enhances their negotiation position. Therefore, the CBNRM support network needs to strengthen its efforts to collect and publish such information.

Issues for government

- There is scope for government to contribute to an enabling CBNRM-environment by providing market information and by monitoring market development;
- To stimulate tenure security (increased length of (sub-)leases), transparency (clarity on resource user rights) and transferability (of leases) to attract investments;
- There is an urgent need for a more transparent hunting quota-setting system;
- There is need for a comprehensive and transparent system of wildlife pricing, taking into account domestic and Southern African trends. Pricing should be based on the marginal opportunity costs; values should reflect the Total Economic Value; and
- Focus on high potential regions and on those regions with some potential but without other livelihood alternatives.

Research issues

- It is important to review regularly the threshold levels of wildlife density below which wildlife activities become non-viable;
- It is also necessary to regularly analyse the revenues from tourism concessions in order to follow market trends and to be able to identify the potential and comparative advantages of different regions;
- To carry out economic assessments of wildlife activities to assess the viability, to identify constraints and to improve the economic performance;
- To establish a system to calculate the economic returns from wildlife and livestock activities in different agricultural districts and wildlife areas. Such as system would be based on existing agricultural and wildlife statistics. The system would assist in identifying comparative advantages by region, and trends in livestock and wildlife activities and markets; and
- To start preparing Natural Resource Accounts for Wildlife and Tourism, including the review of wildlife prices, markets and resource rents.

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