

The Rhino Horn Trade: Everything You Need To Know

By
Jacob Argue

Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Public Policy

Sanford School of Public Policy
Duke University

Thesis Advisor: Dr. Sarah Bermeo

May 2022



(Photo Credit: South African Brent Stirton, winner of the Natural History Museum of London's Wildlife Photographer of the Year competition for this submission. This Black Rhino was killed by poachers the night before, then dehorned).

Abstract

The illegal trade in rhino horn is a heated topic within conservation. Supporters and detractors of trade legalization can both find reputable research in support of their positions. As a result, there is a tendency to speak past one another, firmly convinced of the veracity of one's own arguments, and unable to comprehend the reservations of the other side. This report was conceived as a foundation of shared knowledge for researchers, policymakers, and relevant stakeholders to understand the complex dynamics of the rhino horn trade, and to find areas of collective agreement where they can work together for the betterment of the species. While this report includes recommended policy options, its value as a repository of pertinent information on all critical dimensions of the rhino horn trade sets it apart from other research, and should make it a useful resource whether or not one agrees with the conclusions.

Table of Contents

Abstract	1
Table of Contents	2
Glossary	4
Road Map	5
Methodology	6
Evaluating Current Conservation Practices	7
Rhino Population Trends	7
Public versus Private Conservation	8
Captive Breeding Organizations	9
Sustainable Use	10
Rhino within CITES	10
Case Study: Vicuña Convention	12
Overview of the Wildlife Crime Ecosystem	15
What is Illegal Wildlife Trade?	15
Illegal Wildlife Trade Market Size Estimations	15
The Illegal Wildlife Trade as a Serious Organized Crime	16
The International Framework: CITES	17
Global Wildlife Crime Initiatives: The International Consortium on Combating Wildlife Crime (ICCWC)	18
Critical Illegal Wildlife Trade Oversight Organizations	18
Dutch Disease: Natural Resource Extraction in Developing Countries	19
Case Study: Kimberley Process	20
Supply Chains and Value Capture	23
Model Supply Chain of the Illegal Trade in Rhino Horn Products	23
Poachers	23
Runners	24
Intermediaries	25
Exporters and Importers	25
Wholesale Traders	25
Retailers	25
Supporting Actors	26
Annual supply of rhino horn	27

The Rhino Horn Trade

Volumes reaching the end-consumer	28
The costs of the illicit trade	29
Understanding the Demand Side	30
Who Uses Rhino Horn Products?	30
Rhino Horn Use in Traditional Chinese Medicine	32
Other Uses of Rhino Horn Products	33
Demand Response to Legalization	33
Law Enforcement	34
Interpreting Indicators: Seizure Data	35
Demand Reduction Options	36
Policy Options	37
Security	38
Community Empowerment	38
Biological Management	39
Responsive Legislative Provisions and Effective Implementation	40
Demand Management / Reduction	41
Sustainable Funding for Conservation	42
Trade Legalization (or not) Options	43
Option 1: No Trade; End Hunting; Destroy Stockpiles; Support Demand Reduction	43
Option 2: Limited Trade in Hunting Trophies and Live Rhino to Acceptable Destinations (Status Quo); No Commercial Trade; Destroy Stockpiles; Support Demand Reduction	44
Option 3: Limited Trade in Hunting Trophies and Live Rhino to Acceptable Destinations (Status Quo); No Commercial Trade; Maintain Stockpiles; Reconsider Trade When Conditions are Met	44
Option 4: Promote Regulated, Legal Trade Once Conditions Are Met	44
References	45

Glossary

CEN Customs Enforcement Network of the World Customs Organization

CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora. Also sometimes used to describe the international legal order that flows from the Convention, or as shorthand for governance mechanisms or the Secretariat of the Convention

eRhODIS (Rhino DNA Index System), developed by the Veterinary Genetics Laboratory of the University of Pretoria, collects DNA samples of rhinos across South Africa to create a database using the unique DNA profile of individual rhinos with the goal of aiding forensic prosecutions

EIA Environmental Investigation Agency

ICCWC International Consortium on Combating Wildlife Crime (includes CITES, INTERPOL, UNODC, World Bank, WCO)

IUCN International Union for the Conservation of Nature

INTERPOL The International Criminal Police Organization is an international organization that facilitates worldwide police cooperation and crime control

IWT Illegal Wildlife Trade

PEP A Politically Exposed Person is someone who, through their prominent position or influence, is more susceptible to being involved in bribery or corruption

PROA Private Rhino Owners Association

Range state A country within the natural range of rhino populations

TCM Traditional Chinese Medicine

TRAFFIC Trade Records Analysis of Flora and Fauna in Commerce, a leading NGO

UNODC United Nations Office on Drugs and Crime

WCO World Customs Organization

WEN Wildlife Enforcement Network

World WISE UNODC World Wildlife Seizure database

Road Map

This study is broken down into five main chapters to analyze the key topics in the rhino horn trade, followed by a set of policy options and conclusions. Chapter 1 is titled 'Evaluating Current Conservation Practices'. This chapter overviews historical trends in rhino population size and distribution, evaluates competing conservation methods — notably, public and private models — then investigates the conservation success story of the vicuña of South America for potential lessons. Chapter 2 is titled 'Overview of the Wildlife Crime Ecosystem'. This chapter adds perspective on the scope of the problem in relation to other transnational organized crime and describes the roles key stakeholder groups play in stopping illegal wildlife crime. The chapter concludes with a case study comparison with the Kimberley Process, which sought to eliminate conflict “blood” diamonds from the market through a certification scheme. Chapter 3 is titled 'Supply Chains and Value Capture'. This chapter takes the point of view of the criminals to understand their methods, potential motivations, and potential profits at each stage along the supply chain. Chapter 4 is titled 'Understanding the Demand Side'. This chapter takes the point of view of the consumers of rhino horn products, most of whom live in Vietnam and China, to understand their motivations. Chapter 5 is titled 'Law Enforcement and Demand Reduction Options'. This chapter examines the relative merits of increased penalties and anti-use media campaigns on consumer's willingness to purchase rhino horn products. The study culminates with Policy Options, along both the trade/no-trade dimension and other initiatives that should be adopted irrespective of the trade question; the South African government is the target audience. The chapters were designed to be self-contained so that researchers and policymakers with particular interests can explore the topics that interest them most without being overwhelmed. This also means that readers may choose to read chapters out of order without sacrificing much comprehension, although the present ordering will provide the most logical flow.

Methodology

This study of the rhino horn trade seeks to equip policymakers with all the information they need to make informed decisions. The study consists of a meta-analysis of published research by conservationists and natural resource economists in peer-reviewed journals and gray literature from sectoral experts such as the International Union for the Conservation of Nature (IUCN) African Rhino Specialist Group (AfRSG); TRAFFIC, the wildlife trade monitoring network; and the United Nations Office on Drugs and Crime (UNODC), to name a few. This literature review of primary sources was supplemented by more than a dozen semi-structured expert interviews to ensure a complete understanding of the dynamics at work. Potential interview subjects were identified either through their written publications on the rhino horn trade, which establishes their expertise on the topic, or through the positions they held in critical stakeholder groups. The expertise these interviewees graciously provided were invaluable in locating new data sources and proposing new angles to consider.

One challenge in conducting this research was the considerable distance to both range states and consumer countries. The substantial cost barriers involved in conducting a field study precluded that possibility. Moreover, the illegal nature of the activities in question add an additional layer of complexity. A clandestine field study would require building trust with participants in the trade — who would be naturally hesitant to admit as much — in order to get accurate information, and this would take time and skill to develop. As a result, secondary sources provide the only viable alternative. By cross-checking reliable sources against one another and consulting a wide range of experts on conflicting interpretations within the literature, a reasonably accurate conception of the underlying reality emerges.

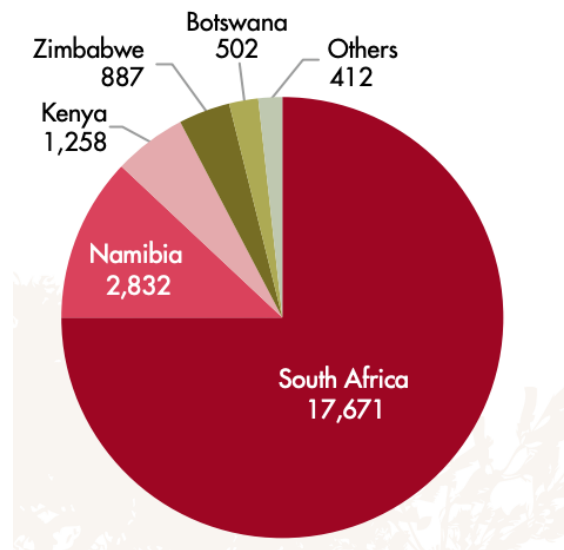
Evaluating Current Conservation Practices

The primary goal of policies surrounding rhino must be the health of the populations. Despite coming to contradictory positions on the appropriate policy responses, participants on both sides of the rhino horn trade debate appear to take this fact as a starting point for their arguments, contending that each of their respective policies are best for the rhinos. In order to give the debate more context, it will be helpful to begin with an objective look at the current conservation status of rhinos. This section will elaborate on 1) trends in the size and distribution of the rhino population; 2) compare and contrast public and private conservation approaches; and 3) expand on the treatment of rhinos within the Convention on International Trade in Endangered Species (CITES).

Rhino Population Trends

White Rhino were widespread on the plains southern Africa until unregulated hunting pushed the species nearly to extinction in the late 19th century. By the turn of the century, one population of 20–50 rhinos in KwaZulu-Natal, South Africa, was all that remained.¹ Following decades of protection and translocations back into range states where the rhino had once roamed, by 2017 there were an estimated 18,064 White Rhino in roughly 400 sub-populations.² The vast majority (99.3%) occur in just five countries: South Africa, Namibia, Kenya, Botswana, and Zimbabwe. South Africa stands out as the most critical range state, accounting for roughly three-quarters of the White Rhino population, and serving as a wellspring from which other populations are replenished.

Estimated Numbers of Rhinoceros by Country in 2017



Source: IUCN

¹ Emslie, Richard, et al. "Species Status." *SANBI*.

² *Ibid.*

Looking at recent history, White Rhino populations surged from 1992–2010, averaging 7.1% growth per year. From 2012 onwards, however, populations have trended in the opposite direction, falling by approximately 15% per year. Much of the drop in estimated numbers comes from staggering losses in South Africa’s Kruger National Park, which protects the majority of the wild rhino population in Africa.³ Since 2007, Kruger has been devastated by poaching. Encompassing 7,523 square miles of land bordering Zimbabwe to the North and Mozambique to the East, Kruger National Park’s vast area and porous borders have proved challenging to protect from poachers. Given the discrepancy between the number of reported poaching incidents in the park and the annual estimations of rhino in the park, which continue to decline at a rapid pace, it is likely that poached carcasses in this massive park go undetected or unreported.

Public versus Private Conservation

The silver lining to the tragic decline in Kruger’s population over the past two decades has been the success of privately-owned wild populations in South Africa, which have trended in the opposite direction. While rhino populations in government-managed conservation areas have plummeted by over 66% in the last ten years — from 10,621 to fewer than 3,549 — privately-conserved rhino populations have grown from approximately 3,000 to 10,500 in the same period.⁴ According to the South African National Biodiversity Institute (SANBI), “[T]here are now more White Rhino on private land in South Africa than there are rhino in the whole of the rest of Africa.”⁵ Private conservationists support their operations through live sales, limited sport hunting, and ecotourism. However, with declining live sale prices for surplus rhino and increased security costs — It is estimated to cost an average of ZAR 200,000 (USD 13,673.39) to support each rhino per year on private land — many of these operations are struggling to stay afloat.⁶ As a result, an increasing number of owners are seeking to get rid of their rhino. Owners with greater scale can reduce their average spend, but only so far. There is a clear trade off between the affordability for the private owners of rhino and the living conditions of the rhino. The more wild the conditions, the higher the cost.

The Private Rhino Owners Association (PROA), “consisting of approximately 330 private game reserves in South Africa that cover an area of over 2 million hectares,” is a non-profit devoted to “promot[ing] the interests of rhinos and private rhino owners.”⁷ They are one of the loudest voices in support of legalizing the rhino horn trade. From their perspective, private owners have succeeded in conserving their rhinos where publicly managed parks have failed. Many of these owners are privately wealthy, and are running their operations at a loss because of a sincere desire to protect these animals. Yet their willingness to take losses has a limit. Unlike public parks, which can refill their coffers through taxes, private reserves must generate the revenues needed to defray their substantial costs by providing goods and services to willing buyers. To their dismay, their most valuable product — rhino horn, of which they quite literally have tons of — is not

³ Ibid.

⁴ Black Rock Rhino Conservation.

⁵ Ibid.

⁶ Ibid.

⁷ “Private Rhino Owners Association.” *Rhino Alive*.

The Rhino Horn Trade

permitted to be sold. From their perspective, if trade were legalized they could reinvest the profits they generate from horn sales back into conservation in a virtuous cycle. One can understand their frustration. Despite the success of their model, they are forced to fight for the survival of the species with one hand metaphorically tied behind their back. They view themselves as victims of regulatory systems stacked against them. By and large, their efforts have gone unrecognized — at times even maligned — by international conservation NGOs. The conflict between private rhino owners and the rest of the rhino conservation community derives from their divergent values systems, which leads both parties to interpret key conservation, legal, and economic facts differently.

Captive Breeding Organizations

The language used to frame the debate is critical. ‘Captive Breeding Operation’ is an important term to keep in mind. Captive Breeding Operation (CBO) is a technical term used by CITES to register the controlled environments where endangered species are being monitored. Privately-owned rhino in South Africa are managed under the auspices of CBOs. The goal of CBOs is to maintain the essential character of the wild population in a setting in which the threatened species’ population can rebound. Captive Breeding Operations vary considerably in size and scope from zoos to vast wildlife preserves. The critical fact is that there must be a boundary of some kind separating the CBO from the surrounding area, regardless of the size of the area enclosed. While illegal CBOs have been utilized to breed Asiatic Black Bear for bile and tigers for their bones — two common ingredients in Traditional Chinese Medicine — unsustainably and in terrible conditions, this is far from the case for rhino CBOs.⁸ Rhino on private reserves (CBOs) inhabit virtually identical landscapes to those found in the ‘wild’ of Kruger and other national parks. These reserves are typically massive in scale, usually thousands of acres. Often transformed from areas of intensive agriculture, these CBOs reintroduce much of the native biodiversity.⁹ With environments restored to their natural form, numerous plants and animals have indirectly benefited from well-funded efforts to protect the rhino with accompanying resurgences in their own populations. The primary difference with CBOs is that they aim to achieve faster growth within their rhino populations than could be achieved in unmanaged areas. As a consequence, CBOs take additional steps to safeguard their rhino, such as providing robust veterinary care, and shielding young from predation, and providing supplemental food and water in times of drought.¹⁰

For organizations like the World Wildlife Fund (WWF), the term ‘Captive Breeding Operation’ carries a different meaning. Without disavowing them entirely, WWF’s Policy Statement appears to equate CBOs with zoos and animal farms.¹¹ As previously mentioned, Captive Breeding Operation is a broad term under which qualifying zoos and animal farms are technically included, and undoubtedly these conditions are far removed from the wild. Yet excluding large private reserves from discussion is an omission that casts CBOs in a much less flattering light than is warranted.

⁸ “Captive Breeding.” TRAFFIC

⁹ Ibid.

¹⁰ Ibid.

¹¹ “Position on Captive Breeding.” WWF.

Sustainable Use

Given what is known about captive bred tigers and bears, WWF is understandably wary of commercial profit of any kind in endangered species. WWF establishes the following criteria:

“Only when threatened species are bred for commercial purposes but the market is controlled, poaching and illegal trade are under control, wild animals are worth less than captive ones (e.g., pets), and the commercial value is low enough not to stimulate further illegal trade and removals from the wild—only then can we say that commercial captive breeding presents a low risk to wild populations” (WWF).¹²

Notwithstanding the fact that poaching is more under control in private reserves than in public lands, which have had far higher poaching rates, the phrase “under control” is ambiguous enough to lose its meaning. Moreover, as previously discussed, although some revenue is generated on private conservation areas, nearly all operate at a loss after accounting for their costs. Private rhino owners do not have the luxury of tax dollars, nor charitable donations, to take idealistic positions about the sanctity of the wild. They seek to be as near wild as possible while preserving rhino for future generations: in other words, sustainable use. According to United Nations Sustainable Development Goal 15, “Life on Land,” sustainable use is acceptable. Whereas ‘pure’ wild is an admirable target, perfect cannot be the enemy of the good. UN Sustainable Development Goal 15’s mission statement reads as follows:

“Protect, restore and promote *sustainable use* of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” [emphasis added]¹³

Clearly there is ample room for disagreement as to what in fact constitutes sustainable use, and later chapters will investigate the specifics more deeply. But the dogmatic opposition to commercial ventures of any kind from WWF and other international NGOs should give one pause, if for no other reason than they appear to be the most successful in preserving stable rhino populations. Trade or no trade, private rhino owners are a key conservation stakeholder and should therefore be consulted regarding policy decisions that affect their interests.

Rhino within CITES

One common misperception is that trade in CITES-protected species and their derivatives is strictly banned: it is not. CITES was not established to ban trade, but to *monitor* trade. There is a de facto ban on trade in rhino horn products because the restrictive conditions under which trade is permitted under the treaty have not been fully met. For reference, the Southern White Rhino — any colloquial use of the word ‘rhino’ within these pages should be read to indicate Southern White Rhino unless otherwise specified — meets the conditions for listing under CITES Appendix II:

¹² Ibid.

¹³ “Indicators: Goal 15.” *Sustainable Development Goals*.

The Rhino Horn Trade

“... species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival” (CITES).¹⁴

CITES Article IV, “Regulation of Trade in Specimens of Species Included in Appendix II”, requires the following conditions are met prior to issuing an export permit:

“(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;

(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and

(c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment”¹⁵ (CITES).

Both the exporting and importing countries must agree that these conditions are met. For example, if (exporting) South Africa considered the conditions met, but (importing) Vietnam did not, a legal trade within CITES could not take place. Furthermore, trade in Appendix I species — such as Black, greater one-horned, Javan, and Sumatran rhinos — is strictly forbidden “for primarily commercial purposes.” This provides a loophole for medical and scientific use, although it is admittedly vague.¹⁶ Appendix II trade is not limited by the “primarily for commercial purposes” provision.

Part of the challenge with the CITES framework is that the “Scientific Authority of the State” is likely to be composed of scientists well versed in the *biological* necessities of conservation, yet be under qualified to answer questions related to the *economic* consequences of exports, such as shifts in supply and demand. For example, South Africa’s Department of Environmental Affairs — the relevant Scientific Authority for that nation — does not have an economics division. Hence, it is being asked to weigh in on a topic that is outside of its area of expertise. The fact that it has chosen not to take a definitive stance in one direction or the other on trade is thus an understandable decision, although its practical effect is indistinguishable from the status quo ‘no trade’ option.

¹⁴ “Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES.” <https://cites.org/eng/disc/text.php>.

“Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES.” <https://cites.org/eng/disc/text.php>.

¹⁵ Ibid

¹⁶ Ibid



Case Study: Vicuña Convention

The Vicuña Convention is widely touted as a conservation success story utilizing sustainable use, and thus may be a helpful benchmark for efforts with rhino. The wild ancestors of Alpacas, Vicuña are Camelids found in the high alpine areas of the Andes. Vicuñas produce small amounts of extremely fine wool, which is very expensive because the animal can only be shorn every three years and has to be caught from the wild. When knitted together, the product of the vicuña's wool is very soft and warm. Revered for their wool since the time of the Incan Empire, when there were an estimated 2 million vicuñas, by 1965 unrestricted hunting had reduced the vicuña population to about 10,000. In 1969, five countries with vicuña — Argentina, Bolivia, Chile, Ecuador, and Peru — entered into the *Convention for the Conservation of the Vicuña*. The convention not only prohibited international trade in the vicuña, but also prohibited domestic exploitation and mandated the creation of reserves and breeding centers. A network of protected areas was created across the different countries and each government developed an Action Plan for their conservation.¹⁷

The 1969 Convention for the Conservation of the Vicuña was modified in 1979, becoming the *Convention for the Conservation **and Management** of the Vicuña* (emphasis added). This marked the beginning of a gradual shift away from the total ban on use. To quote the Convention:

- “Article 1: The Signatory Governments agree that conservation of the vicuña provides an economic production alternative for the benefit of the Andean population and commit themselves to its gradual use under State control, applying such technical methods for the management of wildlife as the competent official authorities may determine.

¹⁷ “The Vicuña: The Theory and Practice of Community Based Wildlife Management.” McNeil et al.

- “Article 2: The Signatory Governments prohibit the hunting and illegal trade of the vicuña, its products and derivatives within their respective countries.
- “Article 3: The Signatory Governments prohibit internal and external trade of the vicuña, its products in their natural state and those manufactured therefrom up to December 31, 1989. In case any of the Parties hereto reaches a vicuña population level, which in terms of management would allow the production of meat, viscera and bones, as well as the processing of skins and wool into cloth, it may proceed to their trade under strict State control. Trade in skin and cloths may be carried out using marks and wefts which are internationally recognizable, registered and/or patented, after coordination with the Parties through the Technical-Administrative Commission of the present Convention and in coordination with the Convention on International Trade in Endangered Species of Wild Fauna and Flora.”

In summary, the 1970s saw trade in vicuña fibers controlled by national legislation (among the five range states) and international legislation (CITES) that produced substantial growth in the vicuña population.

In the 1980s, there was a paradigm shift in conservation away from state-centered control toward approaches in which local people play a more active role.¹⁸ Over the years a strong consensus developed that local people should be involved in management decisions and that they must derive economic benefits. Participation of community members was assumed to enable communities to regain control over natural resources while at the same time strengthening their decision-making capabilities, advancing their involvement in project activities and improving their economic welfare.¹⁹

There were also practical reasons related to the involvement of local people. Government authorities realized that the armed park-guard model was inadequate for providing protection over the vicuña’s vast range, and that the communities on whose land the vicuña lived had to receive benefits if they were to have an interest in vicuña conservation. Considering that the alpine areas vicuña can be found in are resource-poor, with very few alternatives for local people, the possibility of generating income from the sale of vicuña fibers was looked upon favorably. It was hoped that this approach would correct the failures of the pure conservation approach and offer pathways for community development.

The consensus is that the Vicuña convention is both a conservation and development success story. By 2020, the Vicuña population had rebounded from its 1965 nadir of 10,000 to more than 450,000; the International Union for the Conservation of Nature (IUCN) has classified the vicuña as a species of least concern since 2008.²⁰ The wool can cost between \$400 and \$600 per kilogram, with about 12 metric tons produced

¹⁸ Wells, Michael P., and Thomas O. McShane. “Integrating Protected Area Management with Local Needs and Aspirations.” *Ambio* 33, no. 8 (2004): 513–19.

¹⁹ Wainwright, Carla, and Walter Wehrmeyer. “Success in Integrating Conservation and Development? A Study from Zambia.” *World Development* 26, no. 6 (June 1, 1998): 933–44.
[https://doi.org/10.1016/S0305-750X\(98\)00027-8](https://doi.org/10.1016/S0305-750X(98)00027-8).

²⁰ “Vicuna | Habitat, Diet, Lifespan, & Facts | Britannica.” <https://www.britannica.com/animal/vicuna>.

annually, rendering a market size of \$4.8–\$7.2 million per year.^{21 22} Because of the revenue-sharing agreements in place, a majority of that revenue is funneled back to local communities.

Could the Vicuña Convention's proven model be adapted to the rhino case? What are the similarities? What are the differences? Beginning with the similarities, both species are threatened by poaching; possess high-value derivative products for export; inhabit resource-poor land; live adjacent to and/or on the land of economically underdeveloped communities; and are native to multiple range states. The similarities are striking, but there are some crucial differences that may limit full confidence in the comparison.

First, it is considerably more difficult to kill 1,800–2,500 kilogram rhinos with deadly horns than docile 35–65 kilogram vicuñas. This means that rhino poachers are almost certainly better-trained and better-equipped than vicuña poachers. Therefore, anti-poaching teams need to invest more resources to protect rhinos in order to keep up with their adversaries.

Second, although valuable, a single poached vicuña is worth orders of magnitude less than a poached single rhino. This is due to both the differences in the price per kilo for raw vicuña wool (\$400–\$600/kg) and rhino horn (\$4,300/kg), as well as the number of kilos that can be harvested per animal (0.5 kg per vicuña, 5 kg per rhino). Therefore, products from a single rhino are worth approximately 100 times as much as from a single vicuña. With so much larger sums involved at the poacher level — to say nothing of the multiples farther along the supply chain (see Chapter 3) — it is possible that the underlying supply and demand dynamics are not similar enough to be confident in a comparison.

Third, local communities live within the range of vicuña, which graze on their lands, but local communities rarely overlap with rhino ranges. The separation occurs both because rhino are dangerous animals that humans tend not to want to live near, and the introduction of massive natural parks by European colonizers displaced some indigenous people from their native lands. Thus, community-led efforts for protecting rhino from poaching would require radical changes, like opening up protected areas to settlement. After all, if the population does not live there, asking them to protect the area would be no different from hiring additional security staff. The alternative, encouraging rhino ownership by Black Africans, would only be profitable in a legal trade scenario; without trade rhino ownership is a net-loser, out of reach for most local communities.

Finally, vicuña wool has had a domestic market for centuries, whereas the market for rhino horn products is primarily international. The Inca revered and protected the vicuña. The cultural significance of the vicuña is also clear in the Peruvian flag, which displays the animal as a symbol of national pride.²³ There does not appear to be a similar tradition of protection for rhino by African populations, who were more likely to find themselves in opposition to the dangerous animal throughout their history. This is not to say that Africans value conservation less in general, only that the vicuña's cultural significance for Andean populations could have aided in the intensity with which they

²¹ The Business of Fashion. "Inside the Business of Vicuña, the Wool Worth More Than Gold." <https://www.businessoffashion.com/articles/sustainability/inside-the-business-of-vicuana-the-wool-worth-more-than-gold/>.

²² MasterClass. "Understanding Vicuña Wool: The World's Most Expensive Wool - 2022." <https://www.masterclass.com/articles/vicuana-wool-guide>.

²³ "Flag of Peru | Britannica." <https://www.britannica.com/topic/flag-of-Peru>.

sought to protect it, and that intensity may not be replicable without a similarly symbolic species becoming at risk.

In summary, the vicuña example illustrates the possibilities for sustainable use and community economic empowerment in the trade of threatened species' products, but the differences between vicuña wool and rhino horn products are significant. While the differences might not prove insurmountable in achieving a similar win-win outcome, they should be carefully considered before making policy decisions.

Overview of the Wildlife Crime Ecosystem

What is Illegal Wildlife Trade?

According to the International Consortium on Combating Wildlife Crime (ICWC), *Wildlife crime* refers to “the taking, trading (supplying, selling or trafficking), importing, exporting, processing, possessing, obtaining and consumption of wild fauna and flora, including timber and other forest products, in contravention of national or international law.”²⁴ In practice, it is difficult to define wildlife crime globally because each country protects its wild flora and fauna in different ways, with regulations evolving as new risks and priorities emerge.²⁵ As a result, there is not a universally accepted definition of the term. While the illegal trade in the products of popular megafauna species like tigers, elephants and rhino consume most of the media's attention, the illegal wildlife trade is much more complex and pervasive.

Illegal wildlife trade is an element within a wider set of environmental crimes such as forestry and fisheries crimes, illegal mining, minerals trafficking, and the trafficking or illegal dumping of hazardous materials, chemicals, and waste.²⁶ The high profits for committing wildlife crime make it attractive for criminals due to the low risk of detection. As a result, the illegal wildlife trade is often linked to transnational organized crime groups which rely on weak criminal justice responses, corruption and disconnected global law enforcement to advance their crime.²⁷

Illegal Wildlife Trade Market Size Estimations

Global Financial Integrity estimates that the illegal wildlife trade generates between \$5 billion and \$23 billion annually.²⁸ If forestry and fisheries crime are also included, estimates rise significantly. In 2016, a jointly-authored report from the United Nations Environment Programme (UNEP) and Interpol found that illicit revenues from environmental crimes cost between \$91 billion and \$258 billion.²⁹ According to the report, environmental crime — of which the illegal wildlife trade is a subset — is the world's fourth largest criminal enterprise after

²⁴“Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES.”

<https://cites.org/eng/disc/text.php>.

²⁵ UNODC. “World Wildlife Crime Report: Trafficking in Protected Species.”

²⁶ “Natural Resource Related Trade.” *Illicit Trade*.

²⁷ “Environmental Crime and Wildlife Trafficking.” US Department of State, Bureau of International Narcotics and Law Enforcement Affairs.

²⁸ *Ibid.*

²⁹ *Ibid.*

drug smuggling, counterfeiting and human trafficking. Per kilo, the retail revenues for ivory or rhino horn can be equal to or greater than the equivalent amount of cocaine or heroin, yet the legal penalties are considerably more lenient.³⁰ With only \$20-\$30 million spent by international agencies on combating it, criminal profits outweigh enforcement by a factor of 10,000 to 1.³¹

Transnational Crime	Estimated Annual Value (US\$)
Drug Trafficking	\$426 billion to \$652 billion
Small Arms & Light Weapons Trafficking	\$1.7 billion to \$3.5 billion
Human Trafficking	\$150.2 billion
Organ Trafficking	\$840 million to \$1.7 billion
Trafficking in Cultural Property	\$1.2 billion to \$1.6 billion
Counterfeiting	\$923 billion to \$1.13 trillion
Illegal Wildlife Trade	\$5 billion to \$23 billion
IUU Fishing	\$15.5 billion to \$36.4 billion
Illegal Logging	\$52 billion to \$157 billion
Illegal Mining	\$12 billion to \$48 billion
Crude Oil Theft	\$5.2 billion to \$11.9 billion
Total	\$1.6 trillion to \$2.2 trillion

32

Source: Global Financial Integrity

This trade has had a tragic impact on many endangered species, of which rhinos are but one high profile example. According to the World Bank,

*“An elephant is poached for its tusks about every 30 minutes, an African rhino for its horn every 8 hours, one in five fish is caught illegally, and in certain countries, particularly in Africa and South America, 50% to 90% of timber is harvested and traded illegally. As much as 35% of the value of all illegal trade is estimated to come from rosewood.”*³³

While the illegal wildlife trade occurs domestically in every country, the higher profit margins involved in international trade attract transnational organized criminal syndicates.

The Illegal Wildlife Trade as a Serious Organized Crime

According to a recent Financial Action Task Force report, the international illegal wildlife trade is aided by a series of concomitant crimes including money laundering, tax evasion, fraud, corruption, and the use of shell and front companies.³⁴ Traffickers bribe officials and politically exposed persons (PEPs) to allow safe passage of illicit goods, often utilizing falsified permits and documentation.³⁵ Traffickers also use legal channels to obscure the nature of

³⁰ Ibid.

³¹ Ibid.

³² “Transnational Crime and the Developing World.” *Global Financial Integrity*.

Note: IUU Fishing is “illegal, unreported, and unregulated” fishing

³³ “The real costs of illegal logging, fishing and wildlife trade: \$1 trillion–\$2 trillion per year.” *World Bank* blog, 2019.

³⁴ FATF

³⁵ “What is a Politically Exposed Person?” *Lexis Nexis*.

The Rhino Horn Trade

their activities. They regularly utilize legitimate banking services, mobile money services to fund their criminal activities and as money laundering vehicles. Unfortunately, illegal wildlife trade investigations underutilize forensic financial crime tools to catch perpetrators further afield. Some actors have been pushing for that to change. For example, a 2020 OECD report recommended that anti-corruption investigations occur alongside investigations into the illegal wildlife trade to identify and prosecute related criminal networks and “reinforce the engagement of financial intelligence units in follow-the-money investigations related to wildlife crime.”³⁶ Time will tell if these recommendations are taken seriously and implemented in source, transit and destination countries.

The International Framework: CITES

To properly understand the legal framework surrounding the wildlife trade, one must become intimately familiar with its foundational multilateral treaty: CITES. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an “international agreement between 183 member states to ensure that legal international trade in specimens of wild animals and plants does not threaten their survival.”³⁷ The Convention entered into force on 1 July 1975 CITES, providing protections for over 38,700 species – including roughly 5,950 species of animals and 32,800 species of plants. Member states vote to list species under CITES Appendices according to how threatened they are by international trade and how much protection they require. Some whole groups, such as primates, cetaceans (whales, dolphins and porpoises), sea turtles, parrots, corals, cacti and orchids are listed. But in some cases only a subspecies or geographically separate population of a species (for example the population of just one country) is listed.

Briefly, the Appendices are as follows:

- Appendix I includes species threatened with extinction and provides the greatest level of protection, including restrictions on commercial trade.³⁸
- Appendix II includes species that although currently not threatened with extinction, may become so without trade controls. It also includes species that resemble other listed species and need to be regulated in order to effectively control the trade in those other listed species.³⁹
- Appendix III includes species that are listed after one member country has asked other CITES Parties for assistance in controlling trade in a species. The species are not necessarily threatened with extinction.

Importantly, while CITES is legally binding on member states, the convention does not take the place of domestic legislation and does not address the illegal wildlife trade. Many countries do not provide legal protections for non-native species, creating significant gaps in legislation traffickers exploit to engage in laundering of species into legitimate trade.

³⁶ “Illegal Wildlife Trade in Southeast Asia.” *OECD*.

³⁷ “Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES.” <https://cites.org/eng/disc/text.php>.

³⁸ Black (*Dicerorhinus bicornis* spp.), greater one-horned (*Rhinoceros unicornis*), Javan (*Rhinoceros sondaicus*), and Sumatran rhinos (*Dicerorhinus sumatrensis*) are afforded protection under CITES Appendix I

³⁹ White rhinos are protected under Appendix II

Global Wildlife Crime Initiatives: The International Consortium on Combating Wildlife Crime (ICCWC)

Launched in 2010, the International Consortium on Combating Wildlife Crime (ICCWC) coordinates responses and builds capacity across criminal justice systems globally. The Consortium includes representatives from:

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- United Nations Office on Drugs and Crime (UNODC)
- INTERPOL
- The World Bank
- The World Customs Organization (WCO)

The consortium works with the national wildlife law enforcement agencies and the sub-regional and regional wildlife enforcement networks (WENs) that act in defense of natural resources. WENs are regional inter-agency and inter-governmental initiatives to counter the illegal wildlife trade, helping share information on and tackle cross-border wildlife crime and facilitate the exchange of regional best practices in combating those crimes.⁴⁰

Critical Illegal Wildlife Trade Oversight Organizations

The International Union for Conservation of Nature (IUCN)

The IUCN is an international organization comprised of government and civil society organizations and is a recognized global authority on the status of the natural world and the measures needed to safeguard it. The IUCN publishes its Red List which compiles scientific data and information on the global extinction risk status of flora and fauna.⁴¹

United Nations Office of Drugs and Crime

The United Nations Office of Drugs and Crime (UNODC) assists the UN in coordinating a response to transnational organized crimes including drug trafficking, terrorism, corruption, and wildlife crime and provides guidance to governments on adoption and implementation of crime related conventions.⁴² The UNODC “works with legal systems and law enforcement agencies of Member States to strengthen policy, legislative and regulatory frameworks; enhance knowledge and skills to investigate and prosecute related criminal activities; increase awareness regarding the nature and scale of wildlife and forest crimes; and enhance cooperation on national, bilateral, regional and international levels.”⁴³ In 2016 the UNODC published its first World Wildlife Crime Report, updated in 2020, to identify trends in illegal wildlife trade by species and region, providing analysis on supply chains, pricing, and illicit financial flows related to the illegal wildlife trade.^{44 45}

⁴⁰ “Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES.” <https://cites.org/eng/disc/text.php>.

⁴¹ IUCN.

⁴² UNODC.

⁴³ Ibid

⁴⁴ UNODC. “World Wildlife Crime Report: Trafficking in Protected Species.”

⁴⁵ Ibid

United Nations Environment Program

The United Nations Environment Programme (UNEP) sets the UN's global environmental agenda and advocates for the global environment.⁴⁶ According to the UNEP, the "illegal wildlife trade constitutes a barrier to the achievement of both sustainable development and environmental sustainability."⁴⁷ The UNEP notes the human, economic, and national security implications of unfettered illegal wildlife trade and environment crime, as well as noting the role corruption and financial crimes play in multiple comprehensive reports on the illegal wildlife trade and environmental crime. In its 2014 assessment of environment crime the UNEP noted that the illegal wildlife trade "often violates tax laws, anti-money laundering laws, and it may include involvement in organized crime, violence, trafficking and even funding of non-state armed groups."⁴⁸

The International Criminal Police Organization (INTERPOL)

INTERPOL is an intergovernmental organization enabling information sharing and access to data on crimes and criminals between its 194 member state law enforcement agencies. INTERPOL's Environment Security Program encompasses four global enforcement teams (Fisheries, Forestry, Pollution and Wildlife) providing member states investigative support to international cases, develop targets, and coordinate operations against illegal wildlife trade organizations across the supply chain.⁴⁹ INTERPOL runs multiple species-specific operations and programs aimed at arrests and seizures, and strengthening member capabilities to investigate wildlife crime, serving a key role in both coordinating across countries and across law enforcement agencies such as customs and border patrol, wildlife ministries, and national police.

Other Supporting Organizations

There are a number of organizations specializing in investigating and exposing wildlife and environment crimes and the individuals and syndicates behind the crimes including the Environmental Investigation Agency (EIA), TRAFFIC, World Wide Fund for Nature (WWF), Global Financial Integrity (GFI), and Save the Rhino, among others. Non-profit organizations and other key supporting entities can help financial institutions detect suspicious activity linked to the illegal wildlife trade by providing lead data, lists of known illegal wildlife trade offenders and context and background on illegal wildlife trade trends, and tactics, techniques, and procedures utilized by wildlife traffickers. A number of reports are publicly available to reference relevant materials and to understand more about the trade, the syndicates and illicit financial flows.

Dutch Disease: Natural Resource Extraction in Developing Countries

Economists have long known that resource extraction can harm countries in the long-term, despite the added income in the short-term. The phenomenon is known as Dutch disease in response to observed effects of the Netherlands' gas discovery in the North Sea, although it is more commonly applied to developing countries.⁵⁰ The primary causal mechanisms

⁴⁶ UNEP.

⁴⁷ "The Rise in Environmental Crimes. A UNEP-INTERPOL Rapid Assessment."

⁴⁸ Ibid

⁴⁹ Ibid

⁵⁰ "Dutch disease: An economic illness easy to catch, difficult to cure." *Brookings* blog. 2017.

The Rhino Horn Trade

for reduced long-term growth are through increased inequality — unequal distribution of natural resource rents — and increased corruption as those in power seek to maintain their monopoly.⁵¹ Although not always considered as such — our natural reaction is to separate animate objects like wildlife from inanimate objects like gold, diamonds, and oil —wildlife is in fact a natural resource. Consequently, lessons learned concerning the economic ramifications of natural resource exploitation in other contexts can plausibly be extended to the illegal wildlife trade.

Moreover, poaching and wildlife tracking prevents local communities from generating revenue from their most iconic species.⁵² Sustainable ecotourism is a powerful tool that can benefit both economic development and conservation.⁵³ According to Allied Market Research, the ecotourism market was valued at a staggering \$181.1 billion in 2019, with an expected compound annual growth rate of 14.3% in coming years.⁵⁴ When these funds are equitably distributed among local communities, there can be profound development impacts. One study by the David Sheldrick Wildlife Trust estimates that a single elephant can produce up to US\$21,000 in ivory, of which a meager portion goes to the poacher, yet that the same elephant would generate US\$1.6 million in tourism over its lifetime.⁵⁵ In similar fashion, rhinos are worth far more alive than dead.



Case Study: Kimberley Process

The Kimberley Process, a certification scheme to stop the trade in ‘conflict diamonds’, may provide a comparison point for what a legal trade in rhino horn could look like. First, though, one must understand how the Kimberley Process was envisioned and some of the setbacks it has faced. The Kimberley Process takes its name from the May 2000 conference of diamond-producing states in Kimberley, South Africa, that sought to stop the trade in conflict diamonds, also known as ‘blood diamonds.’ The goal was to “ensure that diamond purchases were not financing violence by rebel movements and their allies

⁵¹ “Does inequality drive the Dutch disease? Theory and evidence.” *Journal of International Economics*. 2017.

⁵² “Ivory’s Curse: The Militarization and Professionalization of Poaching in Africa.” Born Free USA. 2014.

⁵³ “The Difference Between Ecotourism and Sustainable Tourism.” Global Sustainable Tourism Council.

⁵⁴ “Ecotourism Market.” Allied Market Research.

⁵⁵ “Elephants are Worth 76 Times More Alive Than Dead: Report.” *Scientific American*. 2014.

seeking to undermine legitimate governments.”⁵⁶ Later that year, the United Nations General Assembly adopted a landmark resolution supporting the creation of an international certification scheme for diamonds. “By November 2002, negotiations between governments, the international diamond industry and civil society organizations resulted in the creation of the Kimberley Process Certification Scheme (KPCS).”⁵⁷ The KPCS went into effect in 2003, when participating countries started to implement its rules. The Kimberley Process is not just an agreement, but also a pseudo-organization. Without permanent offices or staff, the Kimberley Process oversees 59 member countries, numerous industry working groups, and a coalition of civil society organizations that participate as observers. An annual plenary meeting selects the country that will oversee implementation of the certification, and operations of the working groups, committees and administration that comprise the Kimberley Process. The KPCS claims that its members “account for approximately 99.8% of the global production of rough [uncut] diamonds,” thus radically restricting the proportion of conflict diamonds that reach the market [clarification added].⁵⁸ “Under the terms of the KPCS, participating states must meet ‘minimum requirements’ and must put in place national legislation and institutions; export, import and internal controls; and also commit to transparency and the exchange of statistical data.”⁵⁹

The Kimberley Process is not without its limitations, however. For example, the Kimberley Process defines a ‘conflict diamond’ to be a diamond that financed violence of *rebel movements* seeking to undermine legitimate governments. Of course, this poses a number of problems. This says nothing of how the diamonds are mined, working conditions, or even if the diamonds happen to be financing violence or crimes against humanity by the government itself.⁶⁰ Furthermore, conflict diamonds can be sold off to participants in the Kimberley Process and mixed in with legitimate diamonds.⁶¹ A Kimberley Process certificate does not apply to an individual stone but to a batch of rough diamonds which are then cut and shipped around the world; without a tracking system, this is where the trail ends.⁶² While the intention is good, it does not ensure that any diamond purchased within the Kimberley Process Certification is free of the troubling practices associated with the diamond trade.

With a basic understanding of the Kimberley Process Certification Scheme — along with its shortcomings — now in place, what lessons can be learned to build on the successes and avoid the mistakes in a potential regulated trade in rhino horn?

First, a certification scheme agreed to by all rhino range states is likely to be watered down to a level acceptable to all parties. The Kimberley Process was ambitious in its desire to rid the market of conflict diamonds, but its narrow definition of the term limits confidence in the certification. Forecasting to rhino horn, range states could define ‘poaching-free horn’ in a number of ways. The broadest definition would permit any horn from registered owners to be formally certified. However, certification of all non-poached

⁵⁶ “Kimberley Process.” *Kimberley Process*.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*

⁶¹ “The Kimberley Process is the ‘Perfect Cover Story’ for Blood Diamonds.” *The Guardian*.

⁶² *Ibid.*

horn falls into the same trap that the Kimberley Process finds itself in with the diamond trade. By addressing the headline concern, the sale of rhino horn would be legitimized, but other dynamics could weaken the ethics of the practice. For instance, rhino horn owners could react to the change by focusing their attention on horn production over conservation. The wilderness conditions of the rhino could degrade to farm-like conditions. Notably, there is no present indication that rhino horn owners would change their methods. They already have a massive surplus of horn, and add to their stocks each year with current practices. Yet without standards for the ethical treatment of rhino within a potential certification scheme, the credibility that such a scheme requires to be successful would be severely undermined.

Second, the limited 'track-and-trace' capability of the Kimberley Process has greatly reduced confidence that the certificate is trustworthy. Mixing of legal and illegal (poached) horn along the supply chain could pose a similar problem. However, in this instance, rhino horn has an advantage that diamonds do not: unique DNA. Diamonds are chemically identical to one another, and therefore indistinguishable by their natural traits. By contrast, rhino horn contains the genetic signature of the rhino the horn came from. This allows rhino horn provenance to be verified at any point by taking a DNA sample and comparing it to known databases. eRhODIS (Rhino DNA Index System) is the industry leader. Developed by the Veterinary Genetics Laboratory of the University of Pretoria, eRhODIS collects DNA samples of rhinos to create a database using the unique DNA profile of individual rhinos.⁶³ The database has been a useful resource in prosecuting smugglers of poached horn.⁶⁴ The existence of the eRhODIS system provides a plug-and-play option for tracking and tracing horn. Building capacity in less-developed range states to implement the system and sustainably funding the increase in operational costs with greater scale could prove challenging. Some funders, such as WWF, may choose to pull their funding if eRhODIS is used to facilitate a legal trade rather than simply identify poached horn in criminal forensic cases, for example, and this funding would need to be recouped elsewhere. Funding the certification system through export permits is one option, although a perverse incentive would be created: the more horn is exported, the better funded the organization would be. This could lead to certifying suspect horn in order to benefit the bottom line of the organization. Entrenched corruption within a series of range states suggests this outcome is a distinct possibility. The independence of the verification from outside influences would be paramount to maintaining confidence in the certification.

Third, the Kimberley Process's development of institutional frameworks inclusive of all relevant stakeholders should be duplicated if the rhino horn trade is legalized. Semi-annual meetings, collaboration among member countries with rotating chair and vice-chair responsibilities, and the exchange of statistical information all contribute to the success of the Kimberley Process. A simple change in the law to legalize trade would not be sufficient. A robust infrastructure to monitor implementation would be necessary. The founding members of such a pseudo-organization should mirror those from the Kimberley Process: participating governments, industry representatives, and civil society. Power-sharing arrangements would need to be designed carefully. Quotas would need to be established based on conservation criteria and updated annually as conditions change.

⁶³ "The eRhODIS Project." *eRhODIS*.

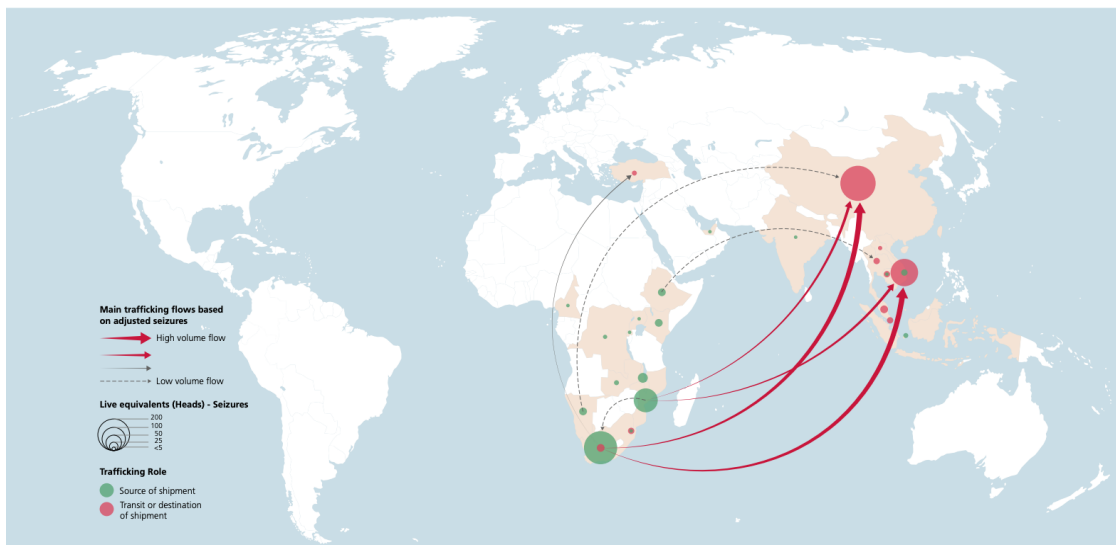
⁶⁴ *Ibid.*

Participating countries would need to be restricted to trade only with other member countries. With these conditions in place, a Kimberley Process 2.0 could be implemented to oversee a legal rhino horn trade.

Supply Chains and Value Capture

Model Supply Chain of the Illegal Trade in Rhino Horn Products

Trafficking Flow Map – African Rhinoceros Horns (2014-2018)



Source: UNODC

As with any physical product where production and consumption are separated by vast distances, rhino horn products traverse along a complex supply chain to reach their consumers. Each actor along the supply chain plays a unique role and is able to capture different amounts of value from the other players. The UNODC Wildlife Crime Report establishes six different trade levels along the illegal supply chain: poachers, runners, intermediaries, exporter/importers, wholesalers, and retail traders.⁶⁵ Understanding the value chain allows for identifying vulnerabilities that may enable disruption of this illegal market. This encompasses understanding the trading patterns, assessing the value added at each step of the value chain, the overall illicit income generated and the income made by each group of actors, as well as analyzing illicit financial flows from the trade in illegal wildlife products.

Poachers

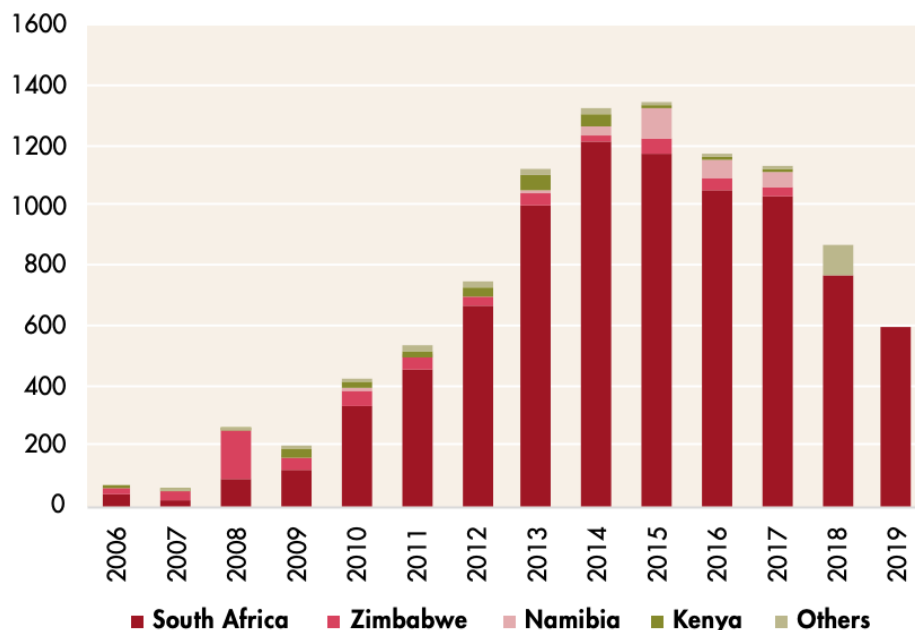
The illegal wildlife trade supply chain begins with poachers. Poachers vary in their sophistication and their levels of independence from the trafficking groups they source for. Subsistence poachers come from poor communities adjacent to protected areas and take the risk of poaching for comparatively little profit. They are unorganized and not well-equipped. Conversely, groups of highly professional poachers with specialized training in tracking and

⁶⁵ Ibid.

The Rhino Horn Trade

shooting skills are able to command higher prices. A poaching group typically comprises a skilled shooter, an experienced tusk or horn cutter, and porters to carry food, water and the product back to safety. Independent poachers self-finance the hunt and sell the horn or tusk to the highest bidder; dependent poachers are hired and subsidized by others higher up in the supply chain.⁶⁶ Besides poaching, rhino horn can enter the illegal market from stockpile theft (for example, from government-held repositories of seized products), and from being harvested from natural mortalities or legal killings (such as problem animal control).⁶⁷

Number of poaching incidents in Africa, 2006 – 2019



Source: IUCN and South African Department of Environment, Forestry, and Fisheries

Runners

The next link in the supply chain are runners, who purchase wildlife products directly from poachers, often to fulfill set orders, and transporters specializing in transporting and delivering the products to the exporter.⁶⁸ At this level of the supply chain, there is a high use of cash, check, money transfer services and mobile money payments like M-PESA in East Africa.⁶⁹ These low-level traffickers usually live in the vicinity of the poaching areas and are familiar with community leaders and persons who purchase the products from the poacher(s). In most cases, the persons involved in the onward trafficking of illegal wildlife parts are not the same persons carrying out the poaching.⁷⁰ There are indications that higher-level traffickers systematically

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ "Money Laundering and the Illegal Wildlife Trade." FATF.

⁷⁰ Ibid.

The Rhino Horn Trade

attempt to distance themselves from the poaching offense. Runners or brokers separate higher-level traffickers from poachers.

Intermediaries

Intermediaries operate at the national level and are often based in a large urban area. They aggregate products and either sell them to exporters or export them themselves (in this case this role conflates with the next).⁷¹ Intermediaries are tasked with the logistical organization of the transaction and the transport of the products to exporters or international wholesalers. Intermediaries are often of Asian (destination country) descent but are resident in or close to source countries.⁷²

Exporters and Importers

The next level, exporters and importers, are likely to be part of organized crime groups, often operating through front companies.⁷³ These individuals work with specialist packers and shippers to obfuscate wildlife products in legitimate seeming shipments. These actors often maintain contacts in ports and customs authorities who assist in the export and import of wildlife undetected, and can procure falsified or fraudulent documentation. Wildlife is consolidated and shipped, often through circuitous routes (both air and maritime) to obscure the true origins of shipments and evade detection.⁷⁴ Upon imported wildlife may be reexported over land to the final destination. Export/import actors show an increasing use of various money value transfer systems (MVTs) including licensed systems and informal systems based on money brokers (rather than the use of cash), such as Hawala, fei chen (flying money) or hundi.⁷⁵ FATF notes at this stage exporters/importers also rely on bank transfers, cash, mobile or social media based payments, and third party payments. In some cases nominee accounts facilitate the bank transfers where locals in source, transit or destination countries serve as a front for the true bank account owner.⁷⁶

Wholesale Traders

Wholesale traders receive the products in the destination country. Once in the country, the products are processed and sold to end consumers at retail outlets or online.⁷⁷

Retailers

Retailers sell the illegal products directly to end consumers. Retailers may operate openly in shops or hidden, with remote communication with customers if the selling is, for example, web-based.⁷⁸

⁷¹ Ibid.

⁷² Ibid.

⁷³ Ibid.

⁷⁴ Ibid.

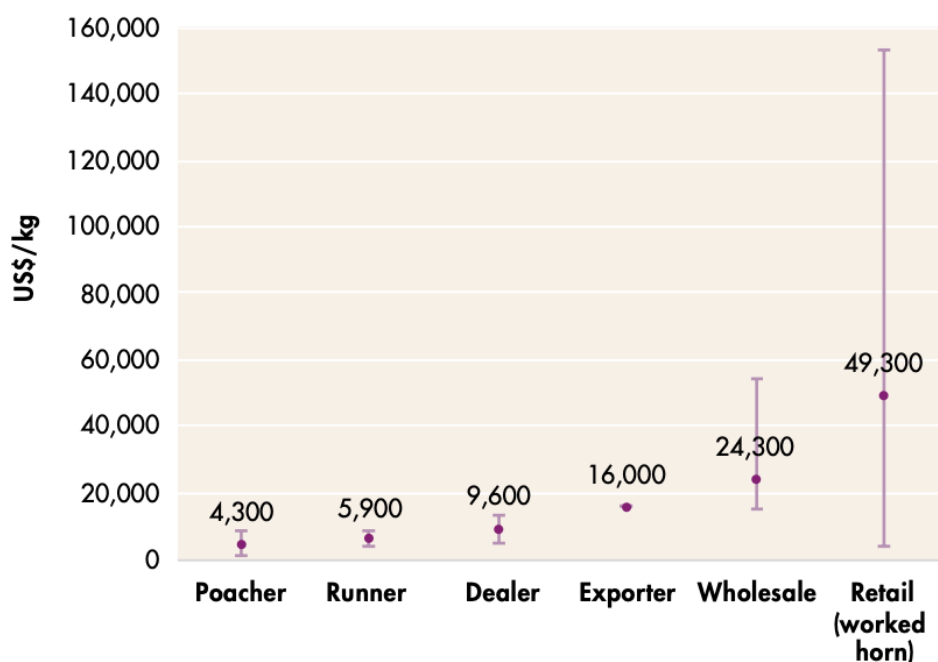
⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Ibid.

Valuation of Price Data for Rhino Horn, by Trade Level (2014-2018)



Source: UNODC

Supporting Actors

Besides these actors, who can be categorized as “primary actors” and handle rhino horn products directly, many others make profits by providing supporting services, such as transportation or money-laundering.⁷⁹ Others facilitate the trade by taking bribes; at lower levels, it is generally local police officers and park rangers who take their cut, while at the international level, it is custom officers at the borders and high-level officials. These groups are facilitators and beneficiaries of the illegal trade in wildlife goods, and part of the illicit supply chain, too.

Value Capture in the Illegal Rhino Horn Trade	Annual Average (2016-2018)
Overall Market Size Asia (end-consumer)	USD 170 - 280 million
Retail	USD 120 - 160 million
International trafficking	USD 28 - 79 million

⁷⁹ Ibid.

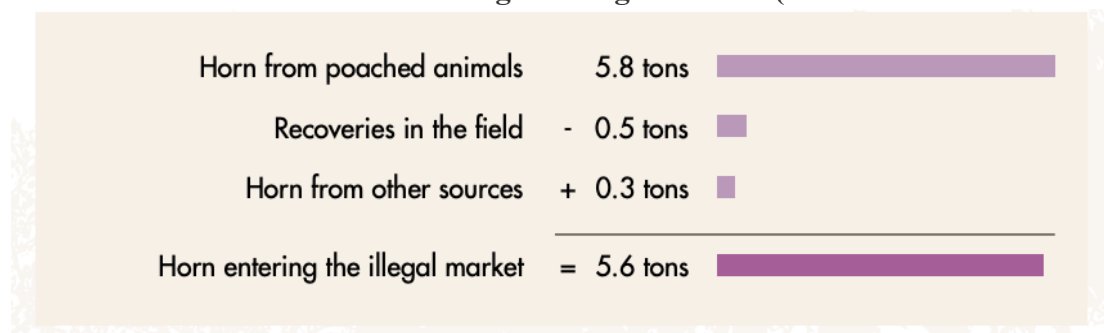
Runners and Brokers	USD 7 - 15 million
Poachers	USD 6 - 43 million

Source: UNODC

Annual supply of rhino horn

Between 2016 and 2018, an annual average of 1,060 rhinos have been illegally killed in Eastern and Southern Africa.⁸⁰ Each animal carried two horns, weighing on average together 5.56 kg or 2.78 kg each.⁸¹ This yielded some 2,100 horns or 5.8 tons of rhino horn harvested from poached animals per year.⁸² Of these, 91 per cent or 5.3 tons were estimated to have entered the illegal market (sold onwards), the remainder supposedly recovered in the field before being sold.⁸³ Poached animals are not the only source of rhino horn entering the illegal market. It was estimated that an annual average of 113 horns or 314 kg of horn were obtained from sources other than poaching, such as stockpile theft, theft from natural mortalities or trophy hunting.⁸⁴ In these ways, an estimated total of some 5.6 tons of rhino horn entered the illegal market in Africa each year between 2016 and 2018.⁸⁵ These numbers may be underestimations and are surrounded by some uncertainty.⁸⁶ The numbers of illegally killed rhinos are to be understood as minimum numbers, since it is possible that carcasses were not detected. The weight of horn per animal is an average that may mask significant variation in the data. Older animals have larger horns than younger ones, males larger than females, and the probability of being poached might vary depending on horn size. Estimated recoveries from the field and shares of horns entering from other sources may also vary over time.

Tons of Rhino Horn Entering the Illegal Market (2016-2018 annual average)



Source: UNODC

⁸⁰ "Poaching Statistics." *Save The Rhino*.

⁸¹ *Ibid.*

⁸² *Ibid.*

⁸³ *Ibid.*

⁸⁴ *Ibid.*

⁸⁵ *Ibid.*

⁸⁶ *Ibid.*

Volumes reaching the end-consumer

All rhino horn entering the illegal market in a year is either purchased by end consumers, seized by law enforcement, stockpiled for later sale or otherwise lost in the process.⁸⁷ How much of the supply reaches end consumers is therefore determined by the amounts seized, stockpiled or lost.

Stockpiles or inventories may be kept by all actors (poachers, traffickers, wholesalers and retailers) along the supply chain. Some actors may keep stocks as an investment to speculate on higher prices, others may hold on to products to wait for less risky trafficking opportunities or to collect more products to collate a larger shipment. Losses include products rendered unusable during transportation, products lost during manufacture of items and products disposed to avoid arrest. With the uncertainty around stockpiles and in absence of data to estimate losses other than seizures, the calculations in this report assume that all products that enter the market over a certain period are either seized or sold to end consumers in the same period (this goes with the implicit assumption that inventories are constant, that is, products entering inventories are offset by products entering the market from inventories).

The annual estimates are based on three-year averages of supply and seizures, which is thought to account for some delays in the supply chain between source and destination of the product and to smooth the volatility in seizure data.

The data, together with the assessment that there is hardly a retail market for rhino horn in Southern and Eastern Africa, indicate that the main flow of rhino horn originates in Southern and Eastern Africa and goes to East and South-East Asia for final consumption. A minor flow of rhino horn could be destined for the European market (accounting for 4 percent of all World WISE seizures).⁸⁸ However, out of all products seized in Europe between 2016 and 2018 for which a destination country was reported, 43 per cent were destined for East Asia and 15 per cent for South-East Asia.⁸⁹ The remainder, less than 2 percent of all horn seized, was believed to have its final destination in Europe.⁹⁰

Combining supply estimates with seized amounts and destinations of flows, makes it possible to estimate that out of the 5.6 tons of rhino horns entering the illegal market each year, 5.2 tons leave Africa and out of these, 4.6 tons reach end-consumers in Asia. Less than 100 kg might be destined for other regions in the world.⁹¹

Flows of Rhino Horn (2016-2018 annual average)

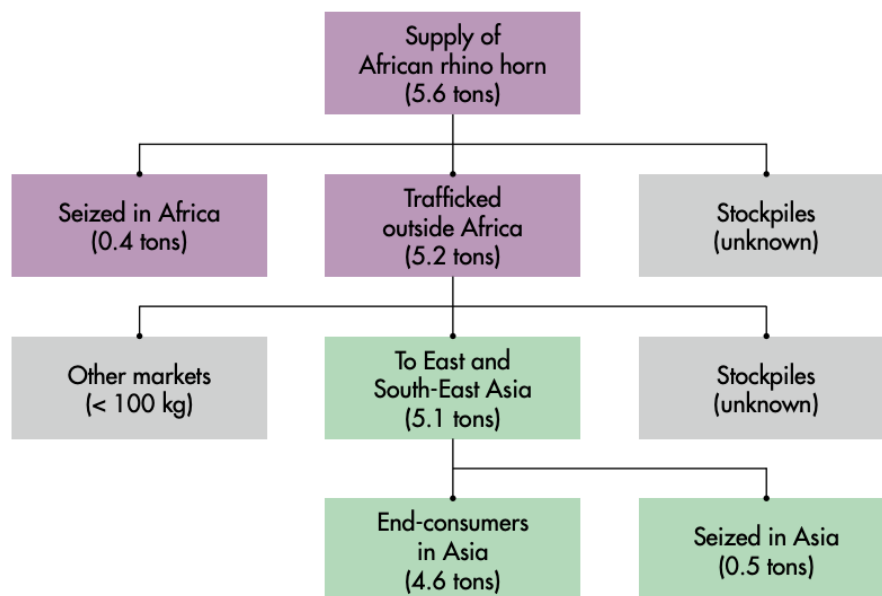
⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Ibid.

⁹¹ Ibid.



Source: UNODC

As in many other licit and illicit markets, the largest value added is generated in retail. At this stage, rhino horn is manufactured into artistic products with qualities varying from machine made items to carefully crafted pieces of art.

The price data at retail needs thus to be interpreted with caution. The prices cover a very broad range, with prices per kg differing between minimum and maximum by a factor of 36 for rhino horn products, reflecting the wide range of possible qualities.⁹² Using an average price masks these large differences, and the resulting values therefore represent an order of magnitude rather than a precise statistical estimate.

The costs of the illicit trade

Organizing crime can be costly. The illegal trade in rhino horn comprises all activities also found in the legal sphere, such as the procurement, production, transportation, sales and distribution of commodities; and all these activities are associated with expenditures for the organizers. Operations of an illegal nature require additional precautions to evade detection, arrest and prosecution by law enforcement, to mitigate the risk of interception, and to conceal or erase traces that may lead to the organizers themselves.⁹³

These costs can make up from two-thirds to 90 per cent of their gross income, with bribes alone making up 4 to 10 percent of the sales value.⁹⁴ A different study on smuggling in South-East Asia found that border officials were paid an ‘unofficial fee’ from US\$10-20 per shipment.⁹⁵

⁹² Ibid.

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ Ibid.

The Rhino Horn Trade

The possible cost components can be grouped into four broad categories:⁹⁶

- Operational costs, which are costs encountered in activities required to facilitate the smuggling. Examples are transportation, labor, material and other inputs.
- Concealment costs, stemming from the actor's activities to conceal and disguise their operations. These costs comprise, for example, the costs for concealment in transportation (such as hiding products in legal shipments), financing safe houses used for hiding products, or purchasing custom-made vehicles (or modifying existing vehicles) to transport illegal commodities.
- Evasion costs, associated with evading arrest and prosecution by law enforcement. Organizers of large-scale operations employ intermediaries to distance themselves from the poaching offense and from the goods and services trafficked. They use complex structures to launder the proceeds of crime into legal businesses, use non-traceable ways for monetary transactions (including nominee accounts and shell companies) and pay other criminal organizations to protect their contraband (security payments).
- Corruption costs, that can be part of any of the above or a separate category. Corruption costs are payments (bribes) to government officials and other corruptive acts or that facilitate the illegal trade at all levels.

Each link in the supply chain faces different costs, and the costs can vary significantly between cases, depending on the business model, the size of the operation and the modus operandi of the organized crime group. Analyzing the possible cost components by a group of actors yields insights into their finances and helps to shed light on the motivations for choosing one business model over the other.⁹⁷

Understanding the Demand Side

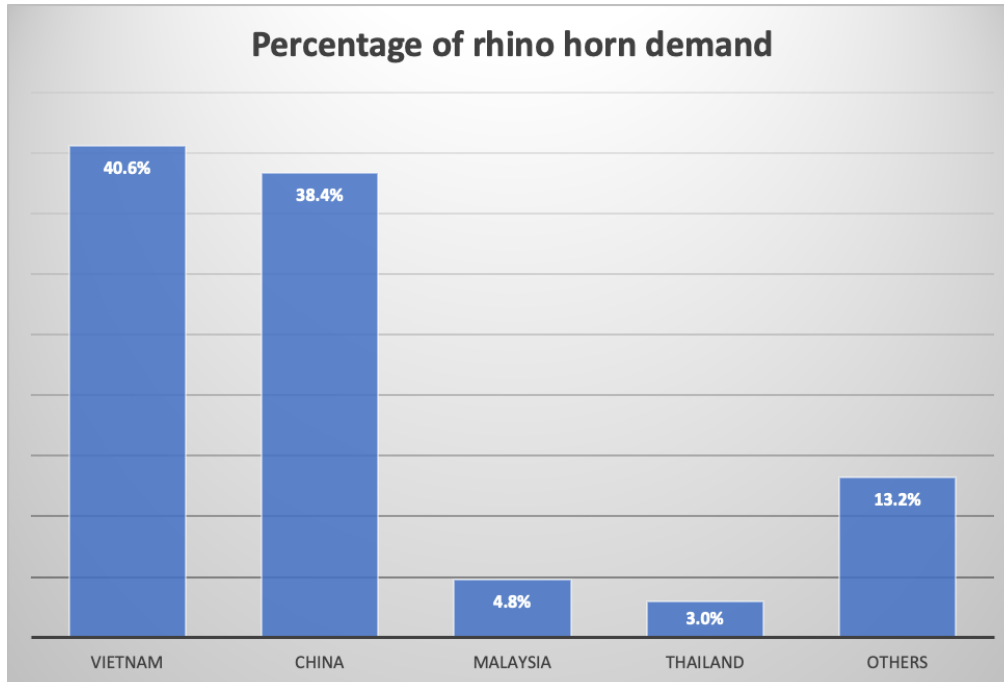
Who Uses Rhino Horn Products?

According to UNODC World WISE seizure data from 2008 to 2019, the main destinations for rhino horn were as follows: Unknown (53.7 percent), Vietnam (18.8 percent), China, (17.8 percent), Malaysia (2.2 percent), Thailand (1.4 percent), and others (6.1 percent).⁹⁸ If one makes the logical conclusion that seizures with unknown destination follow the same pattern as those with known final destinations — in other words, treat the 46.3 percent of known final destinations to be a representative sample — one finds the following distribution: Vietnam (40.6 percent), China (38.4 percent), Malaysia (4.8 percent), Thailand (3.0 percent), and others (13.2 percent). Even this is likely to be an undercounting of the proportions destined for Vietnam and China because of traffickers' use of transit countries to avoid detection.

⁹⁶Ibid.

⁹⁷Ibid.

⁹⁸ Ibid.



Source: World Wide seizure data

Understanding the drivers of demand for consumers of illicit products can be challenging. Illicit markets operate in secrecy, with only trusted friends and family permitted to pierce the veil. Rhino horn markets add to this challenge by virtue of their location half the world away, and operation in foreign languages. As a consequence, little is known about the demand in these markets outside of a few critical studies: 1) in 2014 the CITES Management Authorities of South Africa and Vietnam commissioned the International Trade Center (ITC) to study Vietnamese consumer demand for rhino horn (published in 2017); 2) in 2016 Gao et al published research of fieldwork done in the arts and antiques market in China; and 3) in 2013 TRAFFIC, funded by WWF-SA, surveyed rhino horn users in Hanoi and Ho Chi Minh City.^{99 100 101} Other research appears derivative of this work or primarily speculative. The studies find that rhino horns are used in TCM, as a status symbol, as gifts, and for ornamental purposes. Other researchers have also speculated that rhino horn products may act as a store of value, in effect as a commodity hedge like gold, based on an observed inverse relationship with interest rates.¹⁰² Consumer surveys have not yet verified these claims. It is possible that ‘store of value’ consumers are simply savvy ‘status symbol’ consumers reacting to changes in market conditions.

⁹⁹Gao, Yufang, Kelly J. Stoner, Andy T. L. Lee, and Susan G. Clark. “Rhino Horn Trade in China: An Analysis of the Art and Antiques Market.” *Biological Conservation* 201 (September 1, 2016): 343–47.

<https://doi.org/10.1016/j.biocon.2016.08.001>.

¹⁰⁰ Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017.

<https://doi.org/10.18356/8c574aec-en>.

¹⁰¹ “Rhino Horn Users, Who Are They?” TRAFFIC

¹⁰² “T sas Rolfes et al

Rhino Horn Use in Traditional Chinese Medicine

East Asian cultures have been using animal-based traditional medicine for millennia. Most scholars cite the *Huangdi Neijing*, published circa 300 BCE, as the foundation document for traditional Chinese medicine (TCM).¹⁰³ It is important to note that TCM's philosophy of nature is not reductionist like Western medicine's.¹⁰⁴ Within this (Taoist) philosophy, the imbalances between *yin* and *yang* energies are what cause illnesses. Instead of isolating and treating discrete physical ailments, TCM seeks to holistically balance the vital force of life, or *qi*, within the patient.¹⁰⁵ Thus, since the vital life force is what is in need of repair, plants and animals with their own life forces must be the source of cures. By this reasoning, cures derived from inanimate medical compounds are useless because they ignore the life energy needed to restore the body.

Even cures that seek to mimic the chemical structures of animal products would be insufficient. For example, Western audiences are often puzzled by the fascination with rhino horn derivatives in TCM because it is well known that rhino horn is primarily composed of keratin, a protein found in hair and fingernails. Why not use fingernail clippings to meet the demand? Better yet, why not synthetically produce rhino horns, as the biotechnology company Pembient plans to do?¹⁰⁶ Unfortunately, synthetic copies are unlikely to satiate consumer demand because animal-based products are valued for the *qi* they contain, not their physical composition.¹⁰⁷ Rhinos are "perceived to be unconquerable in wild nature and therefore wild-sourced material is the most potent."¹⁰⁸ The 'Demand in Vietnam' study found that rhino horn users have different willingness to pay for rhino horn from different sources, consistent with their conviction that the environment affects an animal's *qi*. The authors found that rhino horn users are 11.9 percent less willing to pay for farmed rhino horn and 4.9 percent less willing to pay for semi-wild rhino horn compared to wild rhino horn.¹⁰⁹

The authors find evidence of rhino horn products being used to treat a number of ailments. "Interviewees said rhino horn was used for general detoxification, cancer treatment, hepatitis, antipyretic treatment, skin care (such as rash treatment), drinking with Angong Niu Huang Wan (安宫牛黄丸) in stroke treatment, etc."¹¹⁰ It is used as a treatment for serious conditions (15 percent of users), minor conditions (19 percent of users), as a tonic for general well-being (36 percent of users), for alcohol related problems (8 percent of users), and to complement Western medicine (12 percent of users). Despite frequent media reports of rhino horn being used as an aphrodisiac, the authors found no evidence to support the claims.¹¹¹ Most hospitals do not openly prescribe rhino horn treatments, but TCM doctors operating independently often do so. Rhino horn users are mainly older males with higher-than-average incomes, but there is evidence that younger consumers and females represent a significant

¹⁰³ Curran, James. "The Yellow Emperor's Classic of Internal Medicine."

¹⁰⁴ Conversation with Gao Yufang

¹⁰⁵ "Chinese Medicine." Hopkins Medicine.

¹⁰⁶ "Conservation." Pembient.

¹⁰⁷ Ibid.

¹⁰⁸ Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017.

<https://doi.org/10.18356/8c574aec-en>.

¹⁰⁹ Ibid

¹¹⁰ Ibid

¹¹¹ Ibid

segment of the market for rhino horn.¹¹² Interviewees point to their individual medical needs being the most important for changes in their consumption patterns; changes to their income and the price of the products were less significant.¹¹³ Hence, one would expect a highly inelastic demand curve among medical users.

Other Uses of Rhino Horn Products

Besides TCM, rhino horn products are also given as gifts to promote good relations with business and political patrons.¹¹⁴ Considering the prominence of gift giving within Vietnamese business culture, the researchers were surprised to find that giving rhino horn products as gifts only accounts for 12 percent of purchasers.¹¹⁵ The exotic gifts are often displayed prominently as symbols of status and wealth. This fact underscores the evidence that there is no evidence of social ‘stigma’ from rhino horn consumption — whether for medical or non-medical uses. Survey respondents, who also happened to be more likely to use animal products from other endangered species, saw little connection between saving endangered species and purchasing wildlife products. Thus, a Western-style marketing campaign designed to reduce demand would be unlikely to stigmatize consumption.

Demand Response to Legalization

Setting the specifics of conservation and supply side factors aside for the moment, a legal trade in rhino horn products would alter the prices consumers are willing to pay and the number of consumers willing to buy. Interestingly, current Vietnamese rhino horn consumers’ willingness to pay (WTP) is approximately 60 percent lower under the legalization scenario.¹¹⁶ The exclusivity associated with illegal consumption appears to reduce the prestige that some users value. However, both price effects and quantity effects determine the shape of a market, and the quantity demanded under a legalization scenario is expected to increase. Among survey respondents, 24% said they would buy more, 10% would buy less, and 55% said it would make no difference.¹¹⁷

¹¹² Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017.

<https://doi.org/10.18356/8c574aec-en>.

¹¹³ Ibid

¹¹⁴ Garold Lantz, Sandra G. Loeb, and Linh Thi My Le (2005), "Business Gift Giving in Vietnam Within and Between Organizations", in AP - Asia Pacific Advances in Consumer Research Volume 6, eds. Yong-Uon Ha and Youjae Yi, Duluth, MN : Association for Consumer Research, Pages: 286-290.

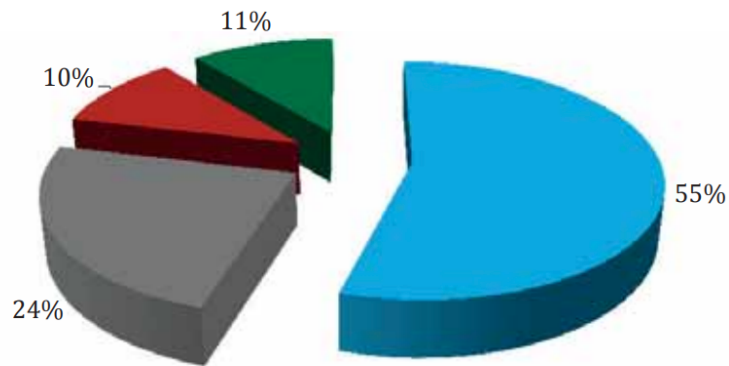
¹¹⁵ Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017.

<https://doi.org/10.18356/8c574aec-en>.

¹¹⁶ Ibid

¹¹⁷ Ibid

Responses to Legalizing Trade in Rhino Horn



■ Make no difference ■ Would buy more ■ Would buy less ■ Don't know

Source: International Trade Center Survey

Unfortunately, the responses were not disaggregated by intended use (i.e., TCM or non-TCM). However, the results indirectly point to increased demand for medical uses and decreased demand for non-medical uses under the legalization scenario. Since most consumers use rhino horn products for TCM, the net effect will be more heavily weighted based on their perspectives than non-TCM users (and potential users). TCM consumers are not motivated by the status aspects of contraband like non-TCM consumers. Current TCM users appear ambivalent about the law because they believe in the curative elements in rhino horn products. Less compromising individuals, who believe in the curative properties of rhino horn products but are dissuaded from use based on the legal status of the current market, are potential sources of demand growth. The study found that 38% of individuals who use animal-based traditional medicine, but do not use rhino horn, expect to buy it in the future. Moreover, 30% of individuals who have never bought animal-based traditional medicine said they were probably going to buy rhino horn in the future.¹¹⁸ A separate study conducted by TRAFFIC in Hanoi and Ho Chi Minh City supports this result; whereas only 5% admitted to buying or consuming rhino horn, 16% reported they might become consumers in the future.¹¹⁹ Consequently, the demand for rhino horn products is likely to increase under the legalization scenario. Although the magnitude of the increase in demand is uncertain, it could be very significant.

Law Enforcement

According to INTERPOL, “the amount of money lost from environmental crime is 10,000 times greater than the amount of money spent by international agencies on combating it — just USD 20-30 million.”¹²⁰ The illegal rhino horn trade, a subset of

¹¹⁸ Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017. <https://doi.org/10.18356/8c574aec-en>.

¹¹⁹ TRAFFIC

¹²⁰ UNEP-INTERPOL

The Rhino Horn Trade

environmental crime, shares this fundamental asymmetry. Parks have not been allocated adequate budgets to hold off poachers. Customs officials in countries like Mozambique, which shares a border with Kruger National Park, turn a blind eye on exports from their shores due to corruption, a lack of capacity, or both. Criminal prosecutors have thus far failed to unravel the transnational criminal organizations responsible for facilitating the illegal trade, instead concluding their investigations with convictions only of the individuals found in direct possession of contraband. Aggressive anti-money laundering techniques have been underutilized in expanding the scope of investigations to include others with whom the accused did business with, for example. It is clear that law enforcement responses to the illegal trade in rhino horn products need to be more comprehensive.

Interpreting Indicators: Seizure Data

Organized crime is a clandestine activity, so collecting price and quantity data to inform policy is challenging. However, seizure incidents provide a window into this opaque market, if only incompletely. A seizure is made when law enforcement authorities find a trafficker in possession of contraband. Like pieces in a puzzle, the more seizures that take place, the more accurate the picture of the market becomes. It is important to put seizure data into perspective, however, because it can easily be misinterpreted. To see how, note that seizure of contraband is reliant on two factors:

- 1) the presence of contraband in the jurisdiction of the seizing authority; and
- 2) the proactive effort to detect and interdict that contraband.

Thus, the quantity of seizures indicates both the presence of a problem and the initiative of the relevant authorities in addressing it. Therefore, countries that dedicate more resources to fighting trafficking could have higher seizure totals because of a higher interdiction rate, not necessarily a higher throughput. As a result, high levels of seizures are not necessarily an indicator of culpability, and are often precisely the opposite. Logically, traffickers prefer countries with limited interdiction capacity to avoid detection. Routes where relevant authorities can be corrupted are a risk mitigation scheme for these traffickers, and where most of the trade is likely to occur.

Seizure data vary considerably in quality due to capacity differences and a lack of international standardization. Ideally, seizures will include information on the method of transport, the nationality of the trafficker, where the contraband originated, where it transited through and where it was destined. If this information is present, each seizure incident is more than a point in time and space: it is a window into the entire trafficking chain, including areas where the contraband had gone undetected. With this in mind, although seizure data cannot be taken at interpreted mechanically and are often incomplete, they represent some of the best evidence available into these criminal markets. (See below for some of the most accurate seizure data available).

African rhino horns entering illegal trade, by source (2016-2017)

Description of source or recovery of horns	Number of horns	% of total*
Source of African rhino horns intended for illegal markets		
Horns on all recorded poached rhinos ¹⁵	4,531	95.2%
Horns stolen from natural mortalities (estimate) ¹⁶	85	1.8%
Thefts from government stockpiles ¹⁷	12	0.2%
Other thefts in Africa (private stocks, museums etc.) ¹⁸	40	0.9%
Horns illegally sold from private stocks (estimate) ¹⁹	57	1.2%
White rhino horns obtained from legal trophy hunts (estimate) ²⁰	32	0.7%
Source Total	4,757	100.0%
Recovery of illegally obtained African rhino horns by enforcement agencies		
Recoveries of illegally obtained horns <i>in situ</i> (estimate) ²¹	408	8.6%
Confiscations/seizures in Africa ²²	425	8.9%
Confiscations/seizures outside of Africa ²³	260	5.5%**
Recovery Total	1,093	23.0%
***Total African rhino horns entering illegal trade	3,664	77.0%

*Percentage of total horns intended for illegal markets.

**Percentage of horns seized outside of Africa, out of total horns intended for illegal markets that leave Africa, is 6.6%.

***Estimated number of horns intended for illegal markets minus estimated number seized.

Source: IUCN SSC AfRSG – TRAFFIC joint report

Demand Reduction Options

Moreover, researchers found that the threat of imprisonment is the most effective way to reduce demand for rhino horn products. TRAFFIC’s thorough ‘Demand in Vietnam’ survey research found that “the prospect of tougher enforcement measures had a much greater impact on future purchase decisions concerning rhino horn, with only a hard core of 15%–20% not inclined to reduce consumption even in the face of a six-month prison sentence.”¹²¹ Reducing demand in this hardcore group of users will be challenging, as they may have a deep and abiding belief in rhino-horn consumption to treat serious illness, and there are some who will continue to perceive it as prestigious. On the other hand, it is worth noting that the enforcement of such measures would necessitate a major change in approach, and this would be challenging given that many users are highly placed government officials and/or members of the business elite. The researchers point to precedent from neighboring China, where the government banned the serving of shark fin soup at official functions and banquets in 2012:

“Reporting in 2014, an antitrade campaigning organization reported an 82% decline in reported sales and a significant decrease in the price (47% retail and 57% wholesale) of shark fins. Furthermore, 85% of Chinese consumers surveyed online said they gave up shark fin soup within the past three years.”¹²²

Media campaigns have been effective in Western countries in the past (the fur coat trade in the 1970s, for instance), but their potential scope to make a significant impact is less encouraging, with only 40% of people who would definitely buy rhino horn in the future saying that media campaigns would motivate them to consume less. It should also be noted that conventional campaign themes such as efficacy of treatment, animal death and suffering, and species extinction appeared to have little traction with consumers, as these

¹²¹ Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017. <https://doi.org/10.18356/8c574aec-en>.

¹²² Ibid

issues were rarely mentioned as a reason why consumers had reduced or stopped consumption of rhino horn and other TCM products.¹²³ Survey respondents saw little connection between saving endangered species and purchasing wildlife products.¹²⁴ Thus, a Western-style marketing campaign designed to reduce demand would be unlikely to stigmatize consumption.

Policy Options

As this study has shown, the rhino horn trade is affected by a complex series of forces. These forces interact with one another, either combining to gain strength or offsetting each other with contradictory dynamics. It is the task of the policymaker to decipher these forces and take action to support positive developments while minimizing the harm caused by foreseeable adverse outcomes. Importantly, the set of available policy options do not lie on a single trade/no-trade axis, but incorporate multiple dimensions for action. Moreover, several agencies, nations, and international organizations will need to collaborate to facilitate implementation of the proposals. Therefore, the fact that certain proposals are supported by the scientific literature does not guarantee their success in practice: determined leadership will be necessary to rally support for changes. South Africa, which has three-quarters of Africa's rhinos within its jurisdiction, is the natural choice to lead change within international fora. Consequently, feasibility studies conducted by the South African government provide a reasonable scope for the domain of acceptable policy options.

In 2016, the South African Department of Forestry, Fisheries & the Environment commissioned a 'Committee of Inquiry' to "deliberate on matters relating to rhino poaching and its effects."¹²⁵ One of the Committee's primary responsibilities was to investigate the feasibility of South Africa tabling a proposal for a trade in rhino horn at the 17th Conference of Parties (CoP17) of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).¹²⁶ (As a historical footnote, South Africa was expected to table a legalization option at CoP17, then pulled out at the last minute, and Eswatini hastily put together a proposal based on the main points of the South African proposal). The Committee of Inquiry was composed of 22 members, each representing stakeholder groups with a bona fide connection to the rhino horn trade. What follows is a summary of the report's policy options, which is representative of the range of acceptable action, supplemented by my analysis.

"The Committee identified six critical areas that require immediate action. These interventions are needed to address wildlife crime and enhance the government's ability to conserve rhino in their natural habitat, and increase the opportunities to realize benefits associated with successful conservation. The Committee was strongly of the view that these interventions are essential for an effective response

¹²³ Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine. United Nations, 2017. <https://doi.org/10.18356/8c574aec-en>.

¹²⁴ Ibid

¹²⁵ "Committee of Inquiry | Department of Environmental Affairs." https://www.dffe.gov.za/rhinopoaching_committeeofinquiry.

¹²⁶ Ibid

to rhino poaching irrespective of whether (or not) South Africa seeks to trade in rhino horn. The six critical areas are Security, Community Empowerment, Biological Management, Responsive Legislative Provisions and Effective Implementation, Demand Management / Reduction, and Sustainable Funding for Conservation.”¹²⁷

Security

The Committee of Inquiry agreed that there is a need to significantly enhance the country’s law enforcement capacity to counter transnational organized crime (including wildlife trafficking), irrespective of whether trade will be legalized or not. The Committee recommended the following security initiatives:

- “Integrated national law enforcement strategy, adopted, funded and included in the strategic plans of all relevant departments;
- Significantly enhanced law enforcement capacity to counter transnational organized crime, including wildlife trafficking;
- Review of existing Memoranda of Understanding (MoUs) with other countries to ensure they provide for enhanced law enforcement cooperation and joint investigations by the relevant authorities.”¹²⁸

Undoubtedly, law enforcement has been a significant challenge. However, one must be clear-eyed about the prospects for additional funding. South Africa is a developing country with a plethora of pressing needs. The violent unrest sparked by the imprisonment of former president Jacob Zuma, exacerbated by anger over poverty and inequality within South African society, makes the prospect of redirecting scarce law enforcement budgets to protecting rhinos less likely. Fortunately or not, within a hierarchy of needs protecting people is a higher priority than protecting rhinos. Until the South African government can demonstrate that it can protect its own people, it is unrealistic to expect additional funds for protecting rhino. Therefore, although more funds are needed, practical policymakers should focus on doing better with the resources they currently have.

Community Empowerment

The Committee of Inquiry agreed there was an urgent need to improve both socioeconomic conditions of rural communities neighboring protected areas. The following minimum requirements must be met in order to effectively address community empowerment:

- “Functional municipalities around key protected areas to provide water, waste, sanitation, energy, roads, transport, education and health services through joint engagement by communities and conservation agencies with all relevant government departments;
- A Champion to be appointed to oversee Community Empowerment, in a permanent position with multi-departmental influence and funding, to develop and implement a Community Empowerment plan addressing these requirements which acknowledges past errors associated with protected area policies;

¹²⁷ Ibid

¹²⁸ Ibid

- Effective two-way channels of engagement to operate between communities and protected area management structures, including the private sector and government agencies, with community involvement at management and Board level;
- Increased access to education and capacity building opportunities in these communities, specifically through a targeted Mentorship Programme to provide qualifications and develop advanced skills in conservation and protected area management for community members and entry into protected area management opportunities;
- Opportunities for alternative economic development are supported in these communities in parallel with capacity building in financial management and business development skills;
- Sound financial management policies and practices are established within communities and municipalities to enable equitable fund distribution methods are implemented to disperse income from protected areas;
- Effective governance structures are developed within communities so they are empowered to hold structures accountable and prevent corruption and elite capture of benefits, including proven mechanism(s) for resolving conflicts between Traditional Authorities (TAs) and Community Property Associations (CPAs);
- A National review is undertaken within the Community Empowerment Plan to ensure better alignment and implementation of community empowerment policies and projects between National, Provincial, Municipal, local and community levels;
- Communities have ownership of conservation initiatives with decision-making powers and authority to equitably access benefits as part of sustainable livelihood initiatives.”¹²⁹

As established in the Vicuña Convention case study, conservation in collaboration with neighboring communities is highly effective. South Africa has a troubling history of interaction with its own local communities, however, and it will take time to gain their trust. The steps above are an excellent start.

Biological Management

The minimum requirements below are aimed at ensuring that there is a low extinction probability for rhino in South Africa; that rhino populations continue to persist in their natural habitat in situations where their vital rates are not manipulated; and that South Africa therefore has the potential to act as a source of rhino for reintroduction into other range states. In order to facilitate these goals, the Committee recommended the following:

- “Approved biodiversity management plans for black and white rhino published in government gazette for implementation;
- Range States action plan aimed at facilitating cooperation and collaboration to conserve rhino within its natural range (collective plan);
- Bilateral engagements with key range States relating to rhino management;
- Resources to implement management plan/s;
- Implementation of management plans;

¹²⁹ Ibid

- Ongoing monitoring and evaluation of the implementation of management plans.”¹³⁰

Rhino conservation is the number one priority. As such, biological management plans that are up-to-date, accurate, and faithfully implemented are crucial. One additional area for improvement is the annual estimates of rhino populations within SANParks. These estimates are not precise enough, given the seriousness of the conservation challenge. While private reserves have every rhino accounted for, SANParks uses a sampling method to extrapolate to its estimated rhino population. This is an understandable shortcut given the less intensive management of rhino within SANParks, but the precision of the estimates needs to be enhanced. Some contend that SANParks leadership has a history of overestimating its numbers.¹³¹ A more conservative methodology would serve to inspire greater trust in the fidelity of its reports.

Responsive Legislative Provisions and Effective Implementation

Although the existing legislative provisions have been used successfully in that they have resulted in the successful conviction of offenders, there is a need for the government to proactively identify gaps and implement amendments to address these gaps. The effective implementation of provisions, compliance monitoring and enforcement must also be strengthened to ensure the use of the legislative tools is optimized. The Committee therefore advanced the following requirements:

- “Existing legislation used optimally to address all aspects of illegal trade (e.g. poaching, organized crime, trafficking, illegal possession of weapons, money laundering);
- Legislation (environmental legislation and others) reviewed and revised to address gaps / emerging issues — this should include appropriate offenses, bail aspects, penalties, enabling provisions and matters relating to foreign nationals involved in poaching and illegal trade (including gaps associated with possible trade models, if trade is an option);
- Incentives for rhino conservation / ownership explored and developed;
- Legislative mandates relating to intensive breeding of rhino clarified and legislative measures developed and implemented to effectively regulate all aspects relating to the activity (applicable to other species as well);
- International engagements with range, transit and consumer States regarding legislative provisions to address illegal wildlife trade;
- Integrated regulatory framework, including a permit system that facilitates monitoring of legal activities involving rhino and rhino horn or other products;
- Rhino horn stockpiles managed and audited as required in terms of legislative provisions;
- Review of international law and relevant multilateral agreements to determine whether there are any mechanisms that can be used to support actions against illegal rhino trade from South Africa.”¹³²

¹³⁰ Ibid

¹³¹ Ibid

¹³² “Committee of Inquiry | Department of Environmental Affairs.”
https://www.dffe.gov.za/rhinopoaching_committeeofinquiry.

This catch-all action is a not-so-subtle repudiation of the South African government's capacity to deliver on its commitments. The provisions outlined above hint at areas of concern in the past, and seek to address those challenges. Improved implementation is a no-brainer, if it can be accomplished. Assigning responsible agencies could have been helpful in avoiding the bureaucratic shuffling of duties that could result without clarity.

Demand Management / Reduction

The Committee of Inquiry uses the phrase 'demand management' for options where trade is permitted, and 'demand reduction' for options where trade is not permitted. This dichotomy reflects the two prevailing views on demand: demand is either entrenched, in which case poaching will continue to provide the supply; or demand is malleable, in which case reducing demand is the key to reducing poaching. The Committee punted the decision on whether demand management or demand reduction — and, by extension, trade — is the appropriate course of action, claiming, "more information is required on consumer's needs, attitudes and behavior and on the prices currently paid for rhino horn in the illegal market." The following requirements relate to the need to increase information on demand management and the system to be put in place to enable government to observe changes in trends relating to demand:

- "Continued interactions with consumers and information-gathering mechanisms within known consumer and range states to better understand consumer patterns, attitudes and behavior;
- Monitoring system to be developed and implemented to gather information relating to prices paid to poachers and the quantity of horn traded."¹³³

To its credit, in the intervening years between the Committee of Inquiry's report (2016) and the present (2022), the South African government and its partners have funded consumer demand studies, such as those referenced in the pages above. In terms of demand management, the research suggests that latent demand for rhino horn products to be used in Traditional Chinese medicine exists, kept at bay by its illegality. The magnitude of the increase in demand is indeterminate based on the known facts, but could turn out to be quite large. On the other hand, research into consumer motivations points to the relative failure of media campaigns emphasizing the ineffectiveness of treatment, harm to animals, etc. Increased penalties for possession were found to be the most effective in reducing demand for rhino horn products. Yet questions remain. The political and business elite that are among the core group of rhino horn users are unlikely to succumb to stricter legislation and enforcement without a fight. There are also questions of sovereignty to contend with. Outside of sanctions, which Western governments are unlikely to consent to on conservation grounds, there is little scope for coercive action. Diplomats will need to find creative ways to inspire policy changes within destination countries, if they are even willing to expend the political capital to broach the subject. Thus, both demand management and demand reduction face uphill battles.

¹³³ Ibid

Sustainable Funding for Conservation

The available evidence suggests that continued and even escalating investment in rhino protection is not sustainable. The costs of sustaining a high protection level for rhino, variously estimated at between R700 million (USD 48 million) and R2 billion (USD 136 million) per annum, will impact on other conservation actions and possibly even other social investments.¹³⁴ Even if demand reduction actions in consumer states start to be effective, it is difficult to predict when pressure from poaching will be reduced. As a result, the alternatives for financing rhino protection in the short to medium term become critically important and several alternative solutions have been considered, such as the following:

- “A concerted campaign with the international and national donor community to raise the necessary capital to contribute to the costs of protection;
- A levy or voluntary contribution by tourism to support investment in rhino protection;
- Environmental offset funding;
- Trade in rhino horn (and possibly other rhino products), which can be managed in such a way that income is generated to contribute to funding protection in public, private and communal reserves.”¹³⁵

Let us examine each proposal in turn. First, a donor campaign may or may not be able to contribute the necessary funds for protection, but this is not a sustainable solution. Governments change, priorities shift, and implied obligations go unfunded. A strategy predicated on donor funding — from governments, philanthropies, or both — cannot be relied upon for the long term. Second, voluntary contributions by tourism seems unlikely to be able to meet the substantial costs required, even in the short term; to assume otherwise would be naive. Third, the environmental offset funding option is unclear. The IUCN defines offsets as “intended to compensate for the residual, unavoidable harm... caused by development projects.” The ‘unavoidable’ harm in this case, poaching, does not contribute to any development objectives. In other words, it is an unadulterated wrong, with no corresponding positive traits. Furthermore, it is not clear who the parties paying and receiving funding would be, or what mechanism would be used. Thus, environmental offset funding is not practicable. Finally, income from trade in rhino horn products, funneled back into conservation, seems to be the only option to meet the funding deficit. The Private Rhino Owners Association may balk at having their hands tied with respect to how they can spend the profits generated from their sales, but without profit-sharing arrangements developed as a compromise with other stakeholders they are unlikely to generate consensus around their pro-trade position. Ultimately, if trade is not legalized, conservation efforts will continue to go underfunded. Policymakers may elect to take that course given their assessment of other critical facts, but they should be aware of the funding challenges.

¹³⁴ Ibid

¹³⁵ Ibid

Trade Legalization (or not) Options

“The Committee proceeded on the premise that addressing the governance challenges (above) forms the cornerstone of all available options for addressing the poaching crisis and was the primary recommendation from the Committee... The Committee also considered a number of possible trade mechanisms. These represent the trade models that were identified as options if a trade proposal was going to be considered.”¹³⁶

Option 1: No Trade; End Hunting; Destroy Stockpiles; Support Demand Reduction

Option 1 is the most aggressive rejection of trade legalization, exceeding current restrictions. The no-trade clause precludes even translocation of rhino to other range states, a proven method for increasing genetic diversity. On conservation grounds alone, therefore, this is a step too far. On first glance, ending hunting appears to be a good idea for rhino — after all, how could intentionally reducing the numbers of a species credibly threatened with extinction be prudent? — but upon further inspection, limited hunting is contributing to conservation. Leading rhino experts Dr. Mike Knight and Dr. Richard Emslie clarify that “only specific, surplus males are targeted, with each case considered on its merits... Simply leaving excess males in populations eventually results in increased fighting and mortalities and slower population growth rates.”¹³⁷ Moreover, the proceeds from each hunt play a significant role in protection funding, likely resulting in more rhino saved from poachers than hunted in the first place. Consequently, ending hunting is not recommended. With regard to stockpiles of rhino horn, there are three possible options: maintain, destroy, or sell. Options 1 and 2 opt to destroy stockpiles; Option 3 opts to maintain stockpiles; and Option 4 opts to sell stockpiles. Destroying stockpiles eliminates the possibility of any future trade. Those fervently opposed to trade are thus supporters, as stockpile destruction essentially locks in their position for all time. Destroying rhino horn stockpiles is meant to ‘send a message’ that there is no acceptable use. Stockpiles also cost money to maintain, and proponents claim that that money could be used on greater protection measures, for instance. Opponents to stockpile destruction contend that some consumers value rhino horn for its scarcity, either as a store of value or as a status symbol, so destroying stockpiles could result in increased demand, prices, and poaching. The precautionary principle emphasizes caution when extensive scientific knowledge on the matter is lacking. Since the consumer reaction is unclear based on published research, stockpile destruction would not be prudent. Furthermore, legal challenges from private rhino owners would be expected in relation to the Constitution of South Africa (1996) Bill of Rights, Section 24 (Environment) and Section 25 (Property).¹³⁸ For the reasons detailed above, Option 1 is not advisable.

¹³⁶ Ibid

¹³⁷ “Black rhino hunt: Why killing one bull is worth it for conservation.” Dr Mike Knight and Dr Richard Emslie

¹³⁸ “Constitution of the Republic of South Africa, 1996 - Chapter 2: Bill of Rights | South African Government.” <https://www.gov.za/documents/constitution/chapter-2-bill-rights#24>.

Option 2: Limited Trade in Hunting Trophies and Live Rhino to Acceptable Destinations (Status Quo); No Commercial Trade; Destroy Stockpiles; Support Demand Reduction

Option 2 provides a clear message that trade in rhino horn is illegal while other forms of sustainable utilization could continue in terms of the existing legislative provisions. As explained in Option 1, stockpile destruction is not recommended. This option is heavily dependent on the success of demand reduction efforts, as demand at current levels is unsustainable. The difficulties with reducing demand are numerous, not the least of which is the fact that demand occurs in countries outside the jurisdiction of South Africa. Changing culture — even objectionable behavior — is unlikely to be successful if the advocacy comes from foreigners. Better to get one's own house in order before telling others what to do. Primarily due to the proposed stockpile destruction, this option is not recommended.

Option 3: Limited Trade in Hunting Trophies and Live Rhino to Acceptable Destinations (Status Quo); No Commercial Trade; Maintain Stockpiles; Reconsider Trade When Conditions are Met

Option 3 maintains the status quo, confirming that commercial international trade in rhino horn is illegal, while leaving the door open to the future. It would be helpful for the 'conditions' that must be met to be clarified so that stakeholders can plan accordingly. By recommitting to current trade policy, this option emphasizes the importance of getting the "six critical areas" (Security, Community Empowerment, Biological Management, Responsive Legislative Provisions and Effective Implementation, Demand Management/Reduction, and Sustainable Conservation Financing) above correct before proceeding. A legal trade would require substantial effort to implement, potentially distracting officials from meeting their targets within other areas of concern. If South Africa can manage to meet the goals set up for the critical areas above — a big if — the trade issue fades in importance. Nonetheless, finding a sustainable financing mechanism will continue to be a problem. A tax on tourist activities, channeled toward rhino protection, is the best solution, if support can be generated. Hence, this option earns qualified support.

Option 4: Promote Regulated, Legal Trade Once Conditions Are Met

Option 4 supports a regulated, legal international trade in rhino horn once certain minimum requirements are met. Unfortunately, as with Option 3, the Committee of Inquiry failed to specify which conditions it will be reviewing. Presumably those conditions have yet to be met for Option 3, and have been met for Option 4. This option provides additional incentives for all rhino owners and potential rhino owners (e.g., local communities) to continue their conservation work. In theory the costs incurred from protecting rhino could be offset by revenue from horn sales. A legal supply chain would provide transparency concerning prices and quantities of horn on the market, but this data is admittedly less useful once the decision to promote legal trade has already been made. This option would have to contend with determined resistance from animal rights groups and organizations working to reduce demand for rhino horn. It is unclear how successful their initiatives will

be, but if South Africa's reputation as a partner in conservation is tarnished — rightly or wrongly — its ecotourism industry could suffer. Research into the demand response of American and European ecotourists should be undertaken to elucidate the validity of this risk. There is also the question of trading partners. Consumer states ostensibly have prohibitions in place that would need to be removed, as well as approving legislation and creating facilitating organizations within their own countries. Possible trade models will require buy-in from, and effective implementation by, range and consumer states. The final decision to legalize trade is not South Africa's alone: international trade legalization must be approved by two-thirds majority of CITES Parties.¹³⁹ This threshold is unlikely to be met any time soon. Furthermore, trade legalization may result in the concentration of rhino populations into fewer hands, with possible conservation implications. Finally, studies into consumer states fail to conclusively predict the demand response to trade legislation; there is too much uncertainty surrounding the "stigma effect," in particular. As a result, despite strong arguments in favor of rhino horn trade legalization, the precautionary principle warns policymakers against adopting this course of action.

References

- IUCN. "A Unified Voice for African Rhinos: Continent-Wide Conservation Plan Launched," September 28, 2016.
<https://www.iucn.org/news/secretariat/201609/unified-voice-african-rhinos-continent-wide-conservation-plan-launched>.
- "African Wildlife Economy Institute." Accessed September 13, 2021.
<https://www1.sun.ac.za/awei/>.
- Ayling, Julie. "What Sustains Wildlife Crime? Rhino Horn Trading and the Resilience of Criminal Networks." *Journal of International Wildlife Law & Policy* 16, no. 1 (January 1, 2013): 57–80. <https://doi.org/10.1080/13880292.2013.764776>.
- "Background on the Issuance of CITES Permits in Respect of the Export of Rhinoceros Horn | CITES." Accessed September 14, 2021.
https://cites.org/eng/news/Background_issuance_CITES_permits_export_of_rhinoceros_horn_15032017.
- Biggs, Duan, Franck Courchamp, Rowan Martin, and Hugh P. Possingham. "Legal Trade of Africa's Rhino Horns." *Science* 339, no. 6123 (March 1, 2013): 1038–39.
<https://doi.org/10.1126/science.1229998>.
- Cheung, Hubert, Lorraine Mazerolle, Hugh P. Possingham, and Duan Biggs. "China's Legalization of Domestic Rhino Horn Trade: Traditional Chinese Medicine Practitioner Perspectives and the Likelihood of Prescription." *Frontiers in Ecology and Evolution* 9 (2021): 27. <https://doi.org/10.3389/fevo.2021.607660>.

¹³⁹ "Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES." <https://cites.org/eng/disc/text.php>.

- . “Medicinal Use and Legalized Trade of Rhinoceros Horn From the Perspective of Traditional Chinese Medicine Practitioners in Hong Kong.” *Tropical Conservation Science* 11 (January 1, 2018): 1940082918787428.
<https://doi.org/10.1177/1940082918787428>.
- Clements, Hayley S., Mike Knight, Pelham Jones, and Dave Balfour. “Private Rhino Conservation: Diverse Strategies Adopted in Response to the Poaching Crisis.” *Conservation Letters* 13, no. 6 (2020): e12741.
<https://doi.org/10.1111/conl.12741>.
- Cole, Daniel H., and Michael D. McGinnis. *Elinor Ostrom and the Bloomington School of Political Economy: A Framework for Policy Analysis*. Lexington Books, 2017.
- “Committee of Inquiry | Department of Environmental Affairs.”
https://www.dffe.gov.za/rhinopoaching_committeeofinquiry.
- “Constitution of the Republic of South Africa, 1996 - Chapter 2: Bill of Rights | South African Government.”
<https://www.gov.za/documents/constitution/chapter-2-bill-rights#24>.
- “Convention on International Trade in Endangered Species of Wild Fauna and Flora | CITES.” <https://cites.org/eng/disc/text.php>.
- Damania, Richard, and Erwin Bulte. “The Economics of Wildlife Farming and Endangered Species Conservation.” *Ecological Economics* 62 (May 1, 2007): 461–72. <https://doi.org/10.1016/j.ecolecon.2006.07.007>.
- Demand in Viet Nam for Rhinoceros Horn Used in Traditional Medicine*. United Nations, 2017. <https://doi.org/10.18356/8c574aec-en>.
- Eikelboom, Jasper A. J., Rascha J. M. Nuijten, Yingying X. G. Wang, Bradley Schroder, Ignas M. A. Heitkönig, Wolf M. Mooij, Frank van Langevelde, and Herbert H. T. Prins. “Will Legal International Rhino Horn Trade Save Wild Rhino Populations?” *Global Ecology and Conservation* 23 (September 1, 2020): e01145.
<https://doi.org/10.1016/j.gecco.2020.e01145>.
- Emslie, Richard H, Tom Milliken, and Bibhab Talukdar. “African and Asian Rhinoceroses – Status, Conservation and Trade,” n.d., 18.
- Emslie, Richard, Tom Milliken, Bibhab Talukdar, Susie Ellis, Keryn Adcock, and Michael Knight. *African and Asian Rhinoceroses – Status, Conservation and Trade. A Report from the IUCN Species Survival Commission (IUCN SSC) African and Asian Rhino Specialist Groups and TRAFFIC to the CITES Secretariat Pursuant to Resolution Conf. 9.14 (Rev. CoP15)*, 2016.
- “Environmental Affairs Concerned about False Impression Created about the Domestic Trade in Rhino Horn | Department of Environmental Affairs.” Accessed September 14, 2021.
https://www.environment.gov.za/mediarelease/rhinohorn_domestictrade_game_rancher.
- “Flag of Peru | Britannica.” <https://www.britannica.com/topic/flag-of-Peru>.

- Gao, Yufang, Kelly J. Stoner, Andy T. L. Lee, and Susan G. Clark. "Rhino Horn Trade in China: An Analysis of the Art and Antiques Market." *Biological Conservation* 201 (September 1, 2016): 343–47. <https://doi.org/10.1016/j.biocon.2016.08.001>.
- Gordon, Iain. *The Vicuña: The Theory and Practice of Community Based Wildlife Management*. Springer Science & Business Media, 2008.
- Haas, Timothy C., and Sam M. Ferreira. "Optimal Patrol Routes: Interdicting and Pursuing Rhino Poachers." *Police Practice and Research* 19, no. 1 (January 2, 2018): 61–82. <https://doi.org/10.1080/15614263.2017.1295243>.
- Hsu, Jeremy. "The Hard Truth about the Rhino Horn Aphrodisiac Market." *Scientific American*. Accessed November 14, 2021. <https://www.scientificamerican.com/article/the-hard-truth-about-the-rhino-horn-aphrodisiac-market/>.
- "India Burns Rhino Horn Stockpile to Send Anti-Poaching Message | IFAW." Accessed November 14, 2021. <https://www.ifaw.org/press-releases/india-rhino-horn-burn>.
- The Business of Fashion. "Inside the Business of Vicuña, the Wool Worth More Than Gold." <https://www.businessoffashion.com/articles/sustainability/inside-the-business-of-vicuna-the-wool-worth-more-than-gold/>.
- "Legal Trade of Africa's Rhino Horns." Accessed September 14, 2021. <https://doi.org/10.1126/science.1229998>.
- Lindsey, P., and William Taylor. *A Study on the Dehorning of African Rhinoceroses as a Tool to Reduce the Risk of Poaching.*, 2011. https://www.researchgate.net/publication/257302939_A_Study_on_the_dehorning_of_African_rhinoceroses_as_a_tool_to_reduce_the_risk_of_poaching.
- Mainka, Susan A., and Judy A. Mills. "Wildlife and Traditional Chinese Medicine: Supply and Demand for Wildlife Species." *Journal of Zoo and Wildlife Medicine* 26, no. 2 (1995): 193–200.
- USAID BiodiversityLinks. "Measuring Efforts to Combat Wildlife Crime: A Toolkit for Improving Action and Accountability." Accessed September 14, 2021. <https://biodiversitylinks.org/learning-evidence/combating-wildlife-trafficking/documents/measuring-efforts-to-combat-wildlife-crime-a-toolkit-for-improving-action-and-accountability/view>.
- Milliken, T. *Illegal Trade in Ivory and Rhino Horn: An Assessment to Improve Law Enforcement under the Wildlife Traps Project*. Cambridge: USAID, 2014.
- Milliken, Tom, and Jo Shaw. *The South Africa-Viet Nam Rhino Horn Trade Nexus: A Deadly Combination of Institutional Lapses, Corrupt Wildlife Industry Professionals, and Asian Crime Syndicates*. Johannesburg, South Africa: TRAFFIC, 2012.

- Patton, Felix. "Conservation Impact Bonds: Innovative Source of Funds for Biodiversity Conservation," n.d., 4.
- Rademeyer, Julian. *Killing for Profit: Exposing the Illegal Rhino Horn Trade*. Penguin Random House South Africa, 2012.
- UNODC. "World Wildlife Crime Report: Trafficking in Protected Species."
- USAID BiodiversityLinks. "Reducing Wildlife Trafficking in Aviation." Accessed September 14, 2021.
https://biodiversitylinks.org/projects/current-global-projects/routes/resources/routes_gap-assessment-best-practices.pdf/view.
- "Resolution Conf. 9.15 (Rev. CoP15)," n.d., 12.
- Rosen, Gail Emilia, and Katherine F. Smith. "Summarizing the Evidence on the International Trade in Illegal Wildlife." *EcoHealth* 7, no. 1 (August 2010): 24–32.
<https://doi.org/10.1007/s10393-010-0317-y>.
- Taylor, Andrew, Dave Balfour, Diane Kirsty Brebner, Rynette Coetzee, Harriet Davies-Mostert, Peter A. Lindsey, Jo Shaw, and Michael 't Sas-Rolfes. "Sustainable Rhino Horn Production at the Pointy End of the Rhino Horn Trade Debate." *Biological Conservation* 216 (December 1, 2017): 60–68.
<https://doi.org/10.1016/j.biocon.2017.10.004>.
- Taylor, William, Brebner, Coetzee, Harriet Davies-Mostert, P. Lindsey, Shaw, and Michael t Sas-Rolfes. *The Viability of Legalising Trade in Rhino Horn in South Africa*, 2014.
- "TRAFFIC | Rhino Horn Trade." Accessed September 14, 2021.
<https://www.traffic.org/what-we-do/perspectives/trade-in-rhino-horn/>.
- MasterClass. "Understanding Vicuña Wool: The World's Most Expensive Wool - 2022."
<https://www.masterclass.com/articles/vicuna-wool-guide>.
- USAID BiodiversityLinks. "USAID Biodiversity Policy." Accessed September 14, 2021.
<https://biodiversitylinks.org/library/resources/usaid-biodiversity-policy/view>.
- "Vicuna | Habitat, Diet, Lifespan, & Facts | Britannica."
<https://www.britannica.com/animal/vicuna>.
- Wainwright, Carla, and Walter Wehrmeyer. "Success in Integrating Conservation and Development? A Study from Zambia." *World Development* 26, no. 6 (June 1, 1998): 933–44. [https://doi.org/10.1016/S0305-750X\(98\)00027-8](https://doi.org/10.1016/S0305-750X(98)00027-8).
- Warchol, Greg L. "The Transnational Illegal Wildlife Trade." *Criminal Justice Studies* 17, no. 1 (March 1, 2004): 57–73.
<https://doi.org/10.1080/08884310420001679334>.
- Wells, Michael P, and Thomas O. McShane. "Integrating Protected Area Management with Local Needs and Aspirations." *Ambio* 33, no. 8 (2004): 513–19.