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Exploitation or Conservation? Can The Hunting tourism Industry in Africa Be Sustainable?

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African Elephants and Mount Kilimanjaro – Amboseli National Park, Kenya.

> "To measure and retain the rich biodiversity of Africa ... we need to break with traditional thinking to catalyze a new vision and join hands in new partnerships."—Nelson Mandela[1]

The term "hunting" is one that holds many negative connotations, with hunting opposition claiming that it is not only immoral but in direct contradiction to the values of a humane society.[2] Alternatively, Mahoney argues that hunting has played an influential role in our survival as a species and that the morals of modern-day society have disconnected us from the processes of the natural world.[3] Due to growing public concern and increased pressure from politicians, hunters are now beginning to recognize the need for change to ensure the longevity of hunting by making it more socially acceptable.[4]

Hunting bans across Africa have been relatively ineffective in protecting wildlife, as they reduce the value of wild animals and therefore reduce local interest in protecting the animals.[5] Since the establishment of the hunting ban in Kenya in 1977, the country has recorded a decline in number by 40 to 90 percent in most animal species.[6] Alternatively, hunting tourism has been extremely successful as it attaches an economic value to the wildlife and therefore encourages the cooperation of local people in conservation efforts for economic gain.

Since the publication of "Our Common Future" in 1987, sustainable development has been at the forefront of environmental policy, attempting to combine economic growth and social development with conservation initiatives.[7] At the International Council for Game and Wildlife Conservation (CIC) workshop in Barcelona it was accepted that hunting tourism was an effective conservation tool with social, economic, and environmental benefits.[8] However, the question remains, how can such a consumptive method of tourism prove to be sustainable? The mere concept of killing to conserve seems counterintuitive. By reviewing current hunting tourism practices in Sub-Saharan Africa, the sustainability of the hunting tourism industry is investigated in this article, providing recommendations to promote the sustainable use of wildlife resources.

Country	Area covered by game ranches (km2)	Percentage of country	Area covered by National Parks (km2)	Percentage of country

South Africa	160,000	13.1	56,500	4.6
Tanzania	250,000	26.4	134,881	14.1
Botswana	133,451	23.0	104,120	18.0
Namibia	94,052	11.4	107,125	13.0

African Hunting Tourism

Uncontrolled hunting by early settlers and explorers in Africa led to the extinction of quaggas (*Equus quagga*), blue buck (*Hippotragus leucophaeus*), and the cape lion (*Panthera leo melanochaitus*).[9] Recognizing the impact of hunting on game populations, hunters made major contributions to the establishment of protected areas for wildlife during the twentieth century, and during this time private landowners permitted the hunting of game on their land.[9] However, it wasn't until the 1970s that landowners realized the economic potential of providing hunting packages to foreigners.[10] Presently in Sub-Saharan Africa an area of 1,394,000 km^2 is utilized as game ranches for trophy hunting, compared to the 1,087,320 km^2 of protected areas established as national parks.[11] A further breakdown, detailing the difference in areas covered by national parks compared with game ranches, is displayed in the table here.

In South Africa the majority of game ranches fall on privately owned land due to changes in legislation that allocated to landowners ownership of wildlife and permitted its consumptive use to generate income.[12] Private landowners are required to possess a hunting outfitters permit, which attempts to regulate the industry by ensuring that only professionals can authorize and oversee hunting. All hunting fees are paid directly to the landowner, who does not have to pay a hunting fee to the government.[13] Although private landowners are under no legal obligation to monitor wildlife populations, hunting practices are reviewed by nine provincial administrations that have the power to suspend hunting if it is perceived to be done in an unsustainable manner.[13]

In Botswana, Namibia, and Tanzania, game ranches fall on state-owned land in the form of either controlled hunting areas (CHAs) or wildlife management areas (WMAs). WMAs strictly prohibit any form of land use other than hunting, whereas CHAs provide opportunities for non consumptive forms of tourism such as wildlife photography.[14] CHAs and WMAs are subdivided into blocks, which are leased by the government to hunting companies (known as outfitters) for a fee. Initially tourists pay a fee to the outfitter; however, additional fees are then charged by governments to tourists for conservation, firearm permits, and trophy export.[15]

Caption: Hunter in Botswana.

Regardless of whether land is privately owned or state owned, hunting is only permitted in the presence of a hunting guide, who ensures that animals are killed in a humane way.[16] Further regulation of hunting is enforced by quotas, which determine a viable number of animals that can be killed to ensure that hunting is sustainable. Quotas are set in accordance with population estimates, and it is generally considered that 2 to 7 percent offtake is sustainable as this allows for alternative forms of mortality on wild animal populations, such as disease, starvation, and predation.[17] Alternatively, on private game ranches enclosed by a fence around the perimeter the quota is dictated by the carrying capacity of the habitat.[18] Hunting regulations also dictate that in species with marked sexual dimorphism, only surplus males can be harvested, to reduce the impact of hunting on reproduction. In other species, where such differences are not as apparent, both sexes can be taken, providing the females are not nursing or accompanied by dependent young.[17]

In terms of the hunting tourism industry, sustainable development can be achieved if it is environmentally sensitive, economically viable, and socially appropriate.[19] It is in relation to these factors that the industry is next discussed in greater detail.

Environmental Impacts

To fulfill the environmental requirements of sustainability, hunting tourism must be of value to conservation through the preservation of habitats and the protection of wildlife. Although protected areas afford this, they are not large enough to contain or maintain wide-ranging, viable animal populations.[20] Alternatively, game reserves encompass a far greater area (highlighted in the earlier table), which could provide a greater network of protected areas for game species, facilitating an increase in population size and genetic variation between populations.

The economic success of hunting tourism hinges on the quality of the game species harvested, which in turn relies on the quality of the habitat to provide their environmental needs. Therefore, it is in the best interests of hunting operators to maintain pristine habitats for game species. Agricultural expansion is a major cause for concern among conservationists, as it leads to habitat fragmentation and ecological degradation.[21] Game reserves play a pivotal role in protecting wildlife habitats, as they attach economic significance to land areas that would normally

be utilized for agriculture.[22] There is much evidence to suggest that hunting is less destructive than other nonconsumptive forms of ecotourism, such as photographic tourism.[23] Hunters have less impact on the environment than photographic tourists as they require fewer local amenities and infrastructure, therefore reducing habitat degradation.[24] The income generated from the hunting industry far exceeds that generated from other forms of ecotourism and is derived from fewer tourists, reducing their ecological impact while providing increased revenue for conservation initiatives.[25] In fenced reserves the controlled hunting of overpopulated herds is an important aspect of habitat management, as this keeps animal populations below carrying capacity, preventing ecological degradation.[15] However, fenced reserves have received much criticism as they block migratory routes.[26]

Caption: An African Buffalo Bull. Photographed at Mabula Game Reserve, South Africa.

Although hunting opposition members argue that hunting by tourists will result in the widespread extinction of greater numbers of animal species, this is not necessarily the case.[15] Bontebok (*Damaliscus pygargus dorcas*), black wildebeest (*Connochaetes gnou*) and cape mountain zebra (*Equus zebra zebra*) have all been successfully reintroduced in South Africa as a result of financial assistance provided by hunting tourism.[27] Similar success has been achieved with the southern white rhinoceros (*Ceratotherium simum simum*), and from 1968 to 1994 populations increased from 1,800 to over 6,370 on privately owned game ranches.[28]

However, concerns have been raised about the evolutionary consequences of hunting, as the most sought-after trophy animals are usually those with the best physical characteristics.[29] By removing animals with superior genes from a population the genetic integrity of that population is compromised, casting doubt over the long-term sustainability of hunting tourism.

Misconduct by game ranch owners threatens the hunting tourism industry's viability as an effective tool of conservation. Some game ranch owners cross-breed closely related species to create unique trophy animals that would prove more desirable to hunters; examples of such hybrids include the red wildebeest and the white springbok.[30] Such genetic manipulation that alters coloration can compromise an animal's ability to evade predation. To diversify the range of species available to hunters, outfitters have introduced exotic species to game ranches, which can

facilitate habitat degradation and loss of biodiversity.[30] Other forms of misconduct include hunting practices from which the trophy animal has little or no chance of escape, such as canned or put-and-take hunting.[11]

The hunting industry is often considered self-regulating, as modest offtake is required to ensure trophy quality remains high over subsequent years.[11] Nevertheless, this kind of exploitation carries the risk of reducing population size to a point where hunting is no longer profitable and in extreme cases leaves the species vulnerable to extinction.[9] To avoid overexploitation, quotas are established to ensure hunting remains sustainable. However, due to a lack of resources, population estimates that determine quotas are often infrequent and the result of educated guesswork, relying on anecdotal evidence from professional hunters and wildlife officers.[31]

Quotas have also been criticized for their failure to acknowledge how animal breeding systems may affect the ability of a species to respond to hunting pressure. Caro et al. analyzed the affect of paternal care and infanticide on the sustainability of current hunting quotas and found both decrease the sustainable offtake.[17] The detrimental effect of hunting on species that practice infanticide has been well documented in lions (*Panthera leo*), which are particularly susceptible to male offtake as the removal of pride-holding males increases juvenile mortality.[32]

Due to the legal repercussions of the killing of game as a preventative measure for crop damage and livestock predation, it is difficult to ascertain how many animals are killed in these circumstances. In turn, this makes it equally as difficult to consider this when establishing quotas. In a review of the Selous game reserve, Caro et al. found that although most species were being hunted at sustainable levels, quotas for eland (*Taurotragus oryx*), hartebeest (*Alcelaphus buselaphus*), lion, reedbuck (*Redunca arundinum*), sable antelope (*Hippotragus niger*), warthog (*Phacochoerus africanus*), and waterbuck (*Kobus ellipsiprymnus*) were set at unsustainable levels.[17] However, the author admitted that although retaliatory killings and illegal offtake are prevalent, these weren't taken into account due to the aforementioned difficulties in estimating the number of animals killed. This suggests that the hunting pressures on game species perceived as problem animals may be greater than originally considered; therefore, quotas for such species should be reviewed to prevent conservation initiatives being impeded.

Corruption also plays a role in destabilizing hunting quotas, as corrupt officials are thought to provide wealthy hunters special permits which authorize quota exempt offtake.[38] Furthermore, in Tanzania, quotas established by the Wildlife Department have been increased by government officials without adequate scientific justification.[39]

Until more scientific measures are put in place to produce more accurate population estimates, the true toll that illegal offtake is taking may never be known and what is considered to be sustainable offtake may be nothing more than unsustainable exploitation.

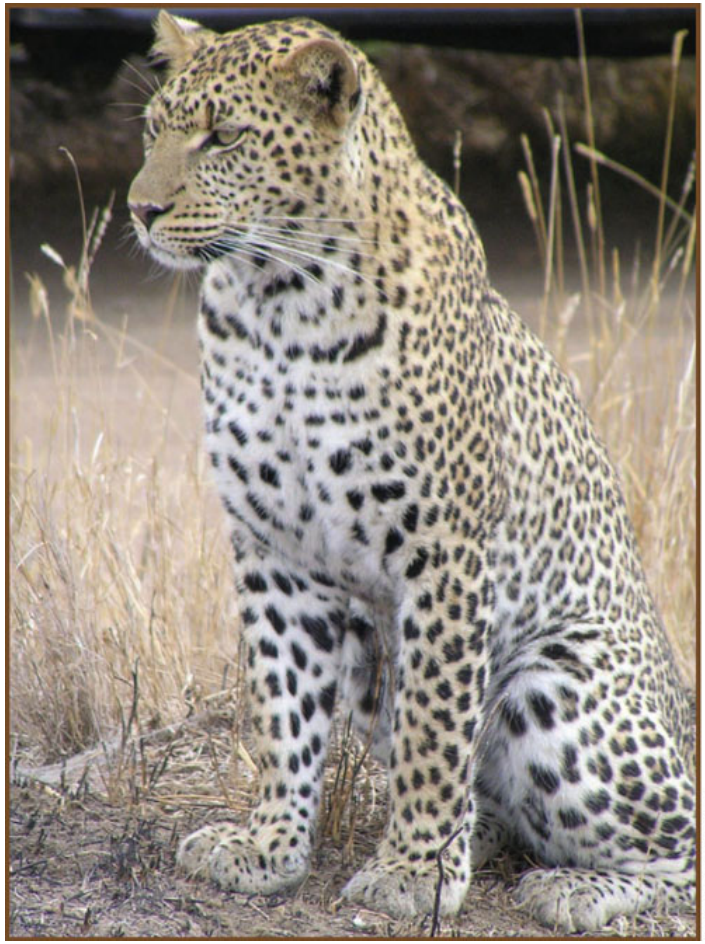
Tourism

The estimated annual revenue generated from hunting in Sub-Saharan African countries is US$201million from 18,500 hunters, which dwarfs that generated across Eurasia, which is an estimated US$33 million to 39 million from approximately 60,000 hunters.[11] The accompanying table details the annual income of the four countries studied.

Country	Annual Revenue (US$million)	Animals shot per year	Most hunted species (with percentage of revenue generated where possible)
South Africa	100	53,885	Lions (8.2%), kudu (13.2%), gemsbok (8.7%)
Tanzania	27.6	7,034	Buffalo, lions, leopards (42% collectively)

Namibia	28.5	22,462	Gemsbok*, kudu*, warthog*
Botswana	20	2,500	Elephants (42%), impala*, steenbok*
Adapted from Lindsey et al.[11]			
***Percentage of total hunting revenue unavailable.**			

The table demonstrates that countries such as Tanzania and Botswana, which primarily derive their income from big game species such as elephants (*Loxodonta africana*), lions, leopards (*Panthera pardus*), and buffalo (*Syncerus caffer*), are able to generate higher revenue through less species killed. This is due to the inflated fees charged to hunt big game species and results in higher revenue for less offtake. A perfect example of this can be observed by comparing statistics between Botswana and Namibia, countries that have similar populations and wildlife resources.[40] During the 2000 hunting season Botswana generated US$12.6million for 2,500 trophy animals; to compete with that figure Namibia, with a high-value game species offtake of 3 percent, would have to kill 13,310 trophy animals.[41] Such conclusions have clear implications on the management of the tourist hunting industry, by reaching equilibrium between high value big game species and low value plains game species (e.g., *kudu Tragelaphus imberbis* and *gemsbok Oryx gazella*) outfitters can potentially reduce the hunting pressure on plains game species. Although prices for hunting different species of game vary between companies, a comprehensive guide of current game prices in South Africa is available in the appendix.



Caption: Panthera pardus, Serengeti, Tanzania.

Statistics from the table here only display the direct income generated from the killing of trophy animals and not multiplier effects such as taxidermy costs, accommodation, airfares, and in country travel which in 2004, generated an additional US$38.71 million to the South African economy.[42] Furthermore, approximately US$2.15 million worth of venison is produced which can either be sold or given away to local communities as a valuable source of protein.[10]

Table: Table 1: Hunting Fees (Trophy & Daily Rate) in South Africa 2005

Species	Highest Price	Lowest Price	Average Individual Price [1]	Median Individual Price [2]	2004 Live Sale Average [3]	2004/2005 Males Live Sale Average [4]
African Wild Cat	$750	$150	$405	$400	$159	n/a

Baboon	$330	$0	$108	$100	n/a	n/a
Blesbuck	$1,563	$123	$369	$350	$118	$151
Blesbuck, White	$1,790	$246	$693	$668	$178	n/a
Bontebok	$3,500	$800	$1,466	$1,400	$1,475	$1,308
Buffalo, Cape	$18,750	$6,000	$11,064	$10,650	$23,608	$7,264
Bushbuck Limpopo & Cape	$1,290	$280	$726	$700	$385	$569
Bushpig	$950	$100	$398	$375	$428	n/a
Caracal (Lynx)	$1,500	–$30	$545	$500	n/a	n/a
Civet	$1,000	$50	$412	$350	n/a	n/a
Crocodile	$6,000	$2,500	$3,720	$3,500	n/a	n/a
Duiker, Blue	$1,500	$420	$881	$875	$587	n/a
Duiker, Grey	$575	$70	$261	$250	$347	n/a
Duiker, Red	$2,500	$600	$989	$950	$634	n/a
Eland, Cape	$3,500	$950	$1,824	$1,800	$696	$1,144
Eland, Livingstone	$3,750	$1,800	$2,525	$2,375	$1,616	$1,636
Fallow Deer	$1,000	$185	$570	$550	n/a	$169
Gemsbok	$1,875	$588	$1,032	$1,000	$558	$613
Genet	$750	$50	$212	$150	n/a	n/a
Giraffe	$4,500	$1,650	$2,807	$2,750	$2,210	$1,750

Grysbuck, Cape	$1,500	$300	$806	$750	$225	n/a
Grysbuck, Sharpe's	$1,800	$500	$971	$950	n/a	n/a
Hartebeest, Cape	$1,790	$500	$927	$900	$533	$562
Hippopotamus	$6,500	$2,500	$5,343	$5,810	$5,015	n/a
Honeybadger	$550	$50	$368	$400	n/a	n/a
Hyena, Brown	$2,750	$250	$950	$748	n/a	n/a
Hyena, Spotted	$2,500	$95	$827	$700	$79	n/a
Impala	$675	$146	$327	$325	$101	$173
Jackal, Blackbacked	$350	–$20	$91	$80	n/a	n/a
Klipspringer	$1,500	$300	$819	$750	$608	n/a
Kudu, Southern & Cape	$3,475	$538	$1,285	$1,200	$322	$889
Lechwe, Kafue	$4,500	$1,900	$3,433	$3,900	n/a	n/a
Lechwe, Red	$4,500	$1,400	$2,684	$2,500	$2,222	$1,635
Leopard	$12,500	$2,500	$5,289	$5,000	n/a	n/a
Lion	$29,500	$15,000	$23,646	$25,000	n/a	n/a
Monkey, Blue	$350	$20	$74	$50	n/a	n/a
Nyala	$3,500	$1,000	$2,243	$2,250	$1,031	$1,430
Oribi	$3,500	$500	$1,192	$1,000	$793	n/a
Ostrich	$1,500	$50	$555	$550	$189	n/a

Porcupine	$250	$0	$123	$100	n/a	n/a
Reedbuck, Common	$1,590	$330	$818	$800	$701	n/a
Reedbuck, Mountain	$1,590	$115	$585	$550	$202	n/a
Rhebuck, Vaal	$1,990	$500	$974	$950	$687	n/a
Rhino	$46,154	$25,000	$35,193	$36,500	$17,881	$11,526
Roan	$11,350	$9,000	$9,963	$9,750	$23,712	$4,152
Sable	$12,000	$4,000	$7,674	$8,000	$9,772	$3,442
Scimitar Horned Oryx	$9,000	$2,500	$5,300	$5,000	$2,273	n/a
Serval	$1,750	$200	$607	$488	n/a	n/a
Springbuck, Black	$1,200	$185	$589	$600	$145	$231
Springbuck, Cape & Kalahari	$675	$92	$336	$350	$83	$145
Springbuck, White	$1,500	$400	$834	$800	$447	$651
Springhare	$150	$25	$62	$50	n/a	n/a
Steenbuck	$750	$90	$283	$278	$207	n/a
Suni, Livingstone's	$3,500	$650	$1,324	$1,200	n/a	n/a

The hunting tourism industry not only injects large amounts of revenue into the economy but provides increased job opportunities. The hunting industry has been directly responsible for the creation of up to 6,000 jobs in South Africa, 4,328 in Tanzania, 2,125 in Namibia, and 1,000 in Botswana.[11] In the Eastern Cape Province of South Africa game reserves have increased employment 3.5 times, increased the average wage 5.7 times, and provided training that would not normally be available.[10] Furthermore, in Sankoyo village, Botswana, a survey revealed that since the establishment of the hunting industry in 1996, 77.4 percent of residents had been employed by the hunting industry, 58.3 percent of which had never previously been employed.[43] This demonstrates how the hunting industry is providing increased opportunities for local communities to improve their quality of life.

Although the hunting tourism industry undoubtedly promotes economic growth, it does not necessarily provide the same economic benefits to local communities. On state-owned land, profits are allocated to centralised government bank accounts and are eventually filtered back to district councils to distribute throughout local communities accordingly.[15] Unfortunately, revenue is

often siphoned away by corrupt officials, meaning that district councils and local communities don't receive the potential benefits such finances would afford them.[44] Furthermore, centralized bank accounts increase transaction costs, which in turn decrease the revenue available for local communities.[15] The proposed solution to such problems involves collecting and banking revenue at a local level. However, corruption not only occurs at a governmental level but also at a local level, and it is not uncommon for district officials to reap all the economic benefits of hunting tourism.[43]

Caption: Jeep safari in the Serengeti National Park. Tourist with digital compact camera observing an African lion pride taking a nap under a tree.

Social Impacts of Hunting Tourism

It is a common thought that Western societies have enforced their conservation practices on African nations without regard for how they perceive wildlife.[45] Population growth requires an increasing amount of land to be allocated to agricultural and industrial expansion; therefore, it is of little surprise that local African communities oppose the conservation of wildlife and habitats.[15] This conflict dictates that wildlife must provide an economic incentive to local communities if conservation efforts are to be successful. Although outfitters provide local communities with improved infrastructure, artificial water sources, and much-needed health care to remote regions, relatively few economic incentives are derived from hunting tourism, leading to negative attitudes toward the industry.[46]

Community-based natural resource management (CBNRM) plays a pivotal role in promoting sustainability by utilizing funds generated from hunting tourism to align conservation interests with rural development.[40] The CBNRM concept involves devolving wildlife resources to local communities and permitting their consumptive use as a form of income generation to improve rural livelihoods. Through participation, it is thought that local communities will begin to value wildlife and contribute toward conservation in a way that African governments, with limited finances and resources, cannot.[43]

Most CBNRM schemes follow the blueprint established by the perceived success of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) program, originally established in Zimbabwe during the late 1980s. Between 1989 and 2006 the project generated US$30 million, of which approximately 52 percent was distributed to local communities to promote rural development projects.[47] No location has benefited more substantially than the Masoka ward, which has used its revenue to improve the livelihoods of its rural residents by

building a four-block primary school, a two-ward clinic, a grinding mill, and two hand-pumped boreholes, to name but a few.[48] In addition, environmental benefits have been witnessed since CAMPFIRE's inception; elephant numbers have increased, buffalo numbers are either stable or witnessing a slight decrease, and habitat loss has diminished, and in certain regions, even reversed.[47]

Caption: Elephant from Kruger Park, South Africa.

Similar success in CBNRM has been observed in Namibia. Barnes and MacGregor reported that, in the year 2000, US$355,900 was generated across five conservancies; such financial returns exceeded capital investments and contributed positively to the national economy while exerting no negative impact on wildlife populations.[49]

Unfortunately, such examples represent the exception as opposed to the rule and it is widely accepted that CBNRM, in its present form, is failing to deliver its ecological and social objectives. Murphree highlighted how benefit and empowerment are critical to the success of CBNRM—it is in relation to these that the contrast in success between CAMPFIRE and Namibia's conservancies and a mountain of failures are next discussed.[4]

CBNRM is most successful when the benefits of game management exceed its costs; such associated costs can be in the form of opportunity costs, damage to crops or livestock, and living with an increased risk of mortality.[50] Local communities that endure the costs associated with living in the vicinity of wildlife are often compensated in CBNRM schemes with financial benefits, increased employment opportunities, improved infrastructure, or the availability of bush meat at competitive prices.[48] These benefits are vital as essentially they are used to create and maintain the interest of the community in conserving wildlife. If such benefits fail to materialize and the costs outweigh the benefits rural residents can lose interest in such schemes and favor unsustainable practices, such as poaching or intensive agriculture, which provide a direct benefit to their livelihoods.[50]

The success of CAMPFIRE and Namibia's conservancies can initially be attributed to the regions in which they are situated. These semi-arid lands are characterised by shallow, infertile soil and erratic rainfall, which act to limit the success of agricultural practice; furthermore, the prevalence of tsetse flies in Zimbabwe restricts livestock production.[51] These restrictions imposed

by the region make the consumptive utilization of wildlife resources a competitive form of land use, offering more benefits to local communities than agriculture.[52] Common sense dictates that the most profitable form of land use will dominate the region; therefore, it is of little surprise that CBNRM has been embraced so successfully in these areas.

CAMPFIRE was initially implemented in areas with low human population density (10 persons/km^2).[53] Similarly, during the formative years of CBNRM in Namibia, there was a human population of only 1.7 million.[49] Wildlife revenue is negatively exponentially related to human population density, as the increased competition results in increased instances of human–wildlife conflict, incurring additional costs and jeopardizing the potential of benefit to be derived from the scheme.[54] Additionally, benefits are usually linked to offtake; therefore, a larger population requires a greater offtake for the scheme to be beneficial, and such demand can lead to quotas being set at unsustainable levels that would endanger the long-term viability of the program. In areas where the potential of wildlife to generate revenue is maximized, communities may need to diversify to promote the long-term sustainability of their programs. Although utilization of wildlife resources was the primary source of income generation during the early years of CBNRM in Namibia, it was soon realized that overreliance on wildlife resources would prove to be unsustainable. Subsequently, communities began to generate additional revenue from thatch-grass harvesting, pole-/fuelwood harvesting, cultural services, and crafts.[49]

The impact of national-level corruption, which restricts the flow of revenue from centralized bank accounts to local communities, has already been discussed. However, corruption is equally prevalent at the local level, and just as damaging. In the Administrative Management Design for Game Management Areas (ADMADE) program, in Zambia, authority over wildlife resources was devolved to traditional village chiefs, who abused their power through nepotism and the use of hunting revenues to improve their own livelihoods.[55] Only 2 percent of the revenue reached rural communities, which proved an insufficient amount to fund rural development projects.[56] This loss of benefit led to an increased demand for poaching, which provided meat for household consumption and a much-needed source of revenue for rural residents. This eventually resulted in the collapse of the system, as prosecuted poachers immediately returned to illegal hunting upon release from prison, and Wildlife Scouts, whose original purpose was to protect game animals against such activities, succumbed to corruption, accepting bribes in exchange for ignorance.[55]

Caption: Gamekeeper with a Kafue Lechwe buck, Zambia.

This example from the ADMADE program demonstrates how corruption and poaching are synonymous. Corruption removes the benefit of CBNRM to rural livelihoods resulting in an increased demand for poaching and the unsustainable harvest of wildlife. In the CAMPFIRE program, communities receive 50 percent of all hunting revenue, which is distributed back to local communities in a transparent, peer-reviewed manner.[47] This has led to a decrease in poaching, as rural residents perceive wildlife to be valuable to their livelihoods.

Empowerment is crucial to the success of CBNRM; however, properly empowered CBNRM regimes are rare. Empowerment can take two forms, through the devolution of wildlife resources to local communities and through the provision of training.

The devolution of wildlife resources instills a sense of responsibility in local communities, which ultimately leads to effective management. Unfortunately, most countries participating in CBNRM do not have the policy or laws in place to legitimize devolution. In the ADMADE program, Gibson and Marks found that the lack of legislation supporting devolution led to the participating communities having no more rights than they did before its inception.[55] Even in CAMPFIRE, a perceived success story, devolution has been limited and communities are only given the authority to manage the finances provided to them by hunting.[57]

Only the state can bestow this form of empowerment on CBNRM regimes, and the state is reluctant to do so as this inevitably leads to a loss of power.[48] This leaves communities with no greater influence over their livelihoods than they had under the fences and fines approach, creating a breeding ground for dissatisfaction, which results in poor management or withdrawal, both of which jeopardize the sustainability of CBNRM.

The alternative form of empowerment is the provision of training, which provides rural residents with the skills necessary to negotiate change and deal with uncertainty. In Botswana, language barriers and limited marketing skills prevent local communities marketing their hunting tourism businesses in foreign countries; this restriction effectively forces them into partnerships with outfitters.[58] Although initial agreements suggested the transfer of skills from outfitters to local communities, this has rarely been practiced; therefore, what was originally intended to be a partnership has now become a management contract where local communities are passive participants in an industry they were meant to inherit.[58] Furthermore, this allows outfitters to reap the majority of the economic benefits of the industry. In 2000, outfitters bought elephants from communities at a price of US$8,000 and sold the hunting rights to tourists for US$80,000, generating a profit of US$72,000, which the local communities did not benefit from.[43]

This demonstrates how the absence of training forces communities into partnerships whereby minimal financial benefit is derived. Far from being an isolated incident, this scenario is common amongst most CBNRM schemes.[48]

Alternatively, CAMPFIRE and Namibia's conservancies have demonstrated how beneficial training can be to local communities. Through prolonged support from donor aid, both schemes were able to provide training in areas of management such as quota-setting methodologies.[47] Such training has allowed both schemes to adopt adaptive management techniques in terms of quota setting, giving consideration to environmental factors, animal abundance, illegal offtake, and trophy quality, and readjusting quotas accordingly to ensure harvests remain sustainable.[59]

Perhaps the greatest factor restricting the success of CBNRM lies in the hands of the conservationists, who misrepresent such schemes as a panacea for rural poverty. By analyzing examples of CBNRM in Zimbabwe and Namibia it is apparent that such schemes only work in a site-specific context. In reality, not all regions contain adequate wildlife populations to support CBNRM projects. In Zimbabwe, it has been noted that 11 of the 23 districts involved in CAMPFIRE do not have sufficient wildlife resources to generate an adequate amount of financial benefit.[60] Identifying the limitations of certain regions can prevent rural residents from losing interest in CBNRM schemes and returning to unsustainable forms of land use. In these areas the consumptive use of wildlife resources should be used as a supplementary form of income to ecotourism or ecoagriculture, if it is to remain sustainable.[61]

Conclusions

Inaccurate quotas that permit the harvest of unsustainable numbers of wildlife are a major threat to the hunting tourism industry; therefore, there is a need for the development of more scientific methods of population estimate. Thermal infrared video imaging has been proposed as one method of attaining more accurate population estimates, and, although expensive, could be funded through hunting revenue.[62] Furthermore, frequent reviews of hunting quotas and the ability to adapt these in accordance with environmental factors can prevent quotas being set at unsustainable levels for prolonged periods of time. Alternatively, by establishing protected areas adjacent to game reserves, these would act as population reservoirs, where wildlife populations could recover free of hunting pressure.[31]

Several steps could be taken to prevent unsustainable hunting practices such as agriculture and poaching destabilizing quotas and jeopardizing conservation initiatives. Accomplishing these steps would require the cooperation of local communities and reform of current CBNRM policy to ensure the steps are tailored to suit the resources of the region. Furthermore, new legislation that would allow local communities to control their wildlife resources could be implemented and enforced at local and national levels to ensure that local communities have the decision-making skills to improve their own livelihoods. Policies that advocate training programs to ensure the transfer of skills from outfitters to local communities could also be developed and enforced so that communities could reap the maximum financial benefits from hunting tourism. There is also a need for a new model for the redistribution of funds back to local communities. Baker suggests a system where revenue generated for local communities is directly linked to offtake.[63] This would ensure that communities are vigilant against any activities contributing to the unsustainable harvest of wildlife populations.

Misconduct among outfitters and private landowners also requires attention, as it raises questions about the viability of hunting as an effective conservation tool. In South Africa hunting can be suspended if any of the provincial administrations determine that hunting practices are unsustainable or undesirable. Lindsey et al. suggest a similar model whereby membership in a national hunting association is required to hunt.[11] Hunting associations would be granted the authority to suspend hunting licences if hunting regulations were not adhered to, and mandatory annual fees would provide the associations with the revenue to monitor outfitter compliance.

Restrictions imposed by CITES (Convention on International Trade of Endangered Species) limit the import of trophy animals to the home nations of tourist hunters.[63] This in turn limits the revenue African countries can generate from exportation and taxidermy fees. Although CITES does not strictly prohibit the export of trophy animals, new arrangements could allow African nations to derive a maximum profit from the export of a sustainable quota of trophy animals.

There are without a doubt economic and environmental benefits of hunting tourism, but these benefits go hand in hand with the threats of unsustainable quotas, poaching, corruption, and misconduct. CBNRM schemes have attempted to utilize the large revenues generated by hunting tourism to merge conservation and rural development. In theory, this is a far more effective conservation tool than the fences and fines approach; however, in practice; the win–win approach of CBNRM is proving to be more problematic.

Critics of sustainable development claim that the concept is contradictory, as economic growth and rural expansion will ultimately impede conservation aims, with the demands of an ever-increasing population causing irreversible damage to the environment. This certainly seems to be the case in relation to the hunting tourism industry. Only in rare, site-specific contexts have natural resources been managed in a manner that promotes social development while upholding conservation values. In the context of Africa, social development and biodiversity conservation are two opposing forces; for one to prevail, the other must suffer.

Ultimately, the greatest challenge for CBNRM will be its ability to remain sustainable in the long term. By 2050 it is thought that Africa's population will have doubled, and with a growing population comes increased demands.[64] Considering this, it is necessary to find other ways to sustain the population than through dependency on wildlife resources.

Appendix 1

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