COMMUNITY CONSERVATION RESEARCH IN AFRICA: Principles and Comparative Practice

Paper No. 5

The Nature of Benefits and the Benefits of Nature: Why Wildlife Conservation Has Not Economically Benefitted Communities in Africa

by

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THE NATURE OF BENEFITS AND THE BENEFITS OF NATURE: WHY WILDLIFE CONSERVATION HAS NOT ECONOMICALLY BENEFITED COMMUNITIES IN AFRICA[1]

Introduction

Community-oriented approaches to wildlife conservation usually have a strong economic rationale. They are typically based on the premise that if local people participate in wildlife management and economically benefit from this participation, then a "win-win" situation will arise whereby wildlife is conserved at the same time as community welfare improves. While most community conservation activities have the ultimate goal of maintaining wildlife populations, they simultaneously aim to improve the socio-economic status of human communities in wildlife areas[2].

This paper will describe how most attempts to conserve wildlife carried out in East and southern Africa over the last decade have been at least partially based on this economic rationale. In order to achieve the joint ends of conservation and human welfare improvement such projects and programmes have followed a common approach to generating economic benefits for the people who live in wildlife areas. In combination with other forms of local participation in wildlife management, benefits have tended to be provided by returning a proportion of the revenues earned by the state from wildlife back to them through indirect benefit-sharing arrangements and grass-roots development activities – mainly the provision of social infrastructure such as schools, water supplies and health facilities.

The economic rationale behind such benefit-based approaches to community conservation – that communities must benefit from wildlife if they are to be willing and able to conserve it – is sound. It constitutes a major advance from traditional exclusionist approaches to wildlife conservation which were largely based on denying community access and gain from wildlife, and has undoubtedly resulted in the more equitable distribution of wildlife benefits. This paper will however argue that such benefit-based models are based on an incomplete understanding of the economics of community conservation and of the nature of wildlife beneifts. Over the long term they may lead neither to community welfare improvement nor contribute to wildlife conservation.

Benefit distribution is a necessary, but in itself may not be a sufficient, condition for communities to engage in wildlife conservation. Whether or not communities have economic incentives to conserve wildlife, and whether or not they are economically better off in the presence of wildlife, goes far beyond ensuring that a proportion of wildlife revenues are returned to them as broad development or social infrastructure benefits. It also depends on the economic costs that wildlife incurs, on the form in which wildlife benefits are received, on the costs and benefits of other economic activities which compete with wildlife and on a range of external factors which all limit the extent to which communities are able to appropriate wildlife benefits as real livelihood gains. Community incentives to conserve wildlife, and the conditions they depend on, vary at different times for different people. Additional economic considerations need to be incorporated into community approaches to wildlife

[1] This paper draws on work funded by the Global Environmental Change Programme of the UK's Economic and Social Research Council (ESCR) entitled 'Community Conservation in Africa: Principles and Comparative Practice'.

This paper has benefited substantially from critical analysis and detailed comments provided by Mike Norton-Griffiths and Ed Barrow.

[2] Although less common, some community wildlife conservation initiatives reverse these goals, primarily aiming contribute to sustainable local development and only trying to conserve wildlife in order to achieve this end.

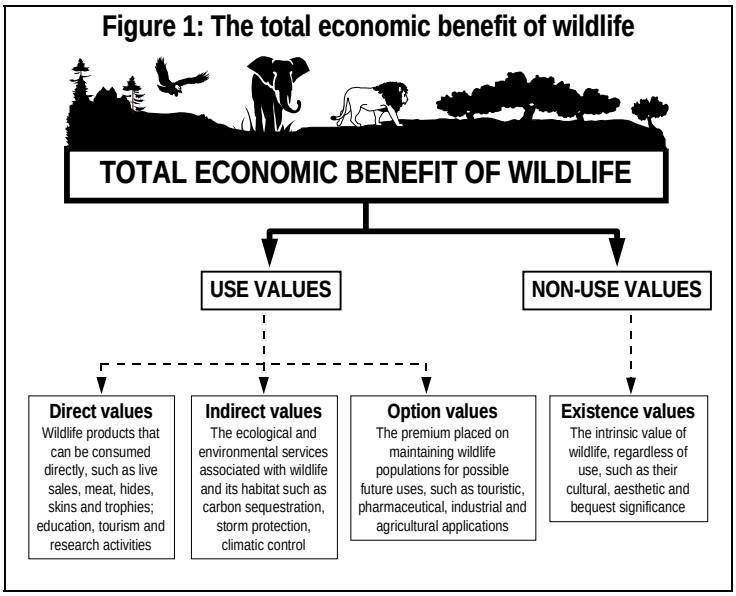
conservation, and form a part of whether such approaches can be judged to have been successful in development and conservation terms.

Wildlife benefits and community conservation

The total economic benefit of wildlife

A starting point in the economics of community conservation is to recognise that wildlife – defined in its widest form to include all kinds of wild plant and animal resources – yields economic goods and services. The high economic value of wildlife, and the need to maintain it for the benefit of present and future generations, provides a major justification for wildlife conservation. The fact that wildlife can generate revenues in turn forms a precondition for community-based conservation. As illustrated in Figure 1, there are multiple economic benefits associated with wildlife. The direct value of such products as meat, hides and trophies and of activities such as tourism, research and education have conventionally formed the focus of economic analysis. Wildlife is now widely recognised by economists to also support a range of ecological services and ecosystem functions, to allow for the option of carrying out economic activities in the future – some of which may not be known now, and to provide considerable intrinsic cultural, aesthetic and existence value to human populations. These benefits accrue at global, national and local levels. The total economic benefit of wildlife is the sum of all these values:

Figure 1: The total economic benefit of wildlife



$$TEB_w = V_d + V_i + V_o + V_e \quad (1)$$

where:
V_d = direct values
V_i = indirect values
V_o = option values
V_e = existence values

The national economic benefit of wildlife

Wildlife benefits accrue at many different levels of scale and to many different groups. Assessing the national economic value of wildlife forms an important step in the economics of community conservation. Unless it can be demonstrated that wildlife resources contribute to development and economic goals at a whole-country level, governments are unlikely to be willing to allocate scarce resources to their wildlife sectors or to engage in community-based forms of conservation. Much of the existing literature on the economics of wildlife conservation focuses on this national economic value of wildlife, which is demonstrably high, as illustrated for Kenya in Box 1. Wildlife can make an important contribution to national income and also help to meet national development goals, and plays an important economic role in East and Southern African countries where sources of

Box 1: The national economic value of wildlife tourism to Kenya

In national economic terms, direct income from wildlife tourism contributes about 5% of Kenya's GDP. It also accounts for just over a tenth of national wage employment and over a third of total annual foreign exchange earnings. Gross income from tourism was worth about US$ 420 million in 1989 of which approximately 50% or US$ 210 million could be attributed to wildlife. This produced a net return of 21% – or US$ 27 million – to the Kenyan economy.

Gross revenues from tourism 1989	US$ 419 m
Tourism revenues attributed to wildlife sector (50%)	US$ 210 m
Foreign exchange retention (82.4%)	US$ 173m
Operating surplus (30% of retained forex)	US$ 52 m
Gross capital charges (12.5%)	US$ 58
Foreign exchange premium (20%)	US$ 35 m
Net returns to wildlife tourism sector	US**$ 27 m**

(Adapted from Emerton 1997a, Norton-Griffiths and Southey 1995)

income, employment, public sector earnings and foreign exchange are all limited. Although there is little quantified information about the indirect and non-use values associated with wildlife – which, as we will discuss later, may have constrained both wildlife revenue generation and attempts at community conservation – the fact that the direct products and services associated with wildlife can provide national income, employment and subsistence opportunities is well documented, as summarised in Figure 2.

Figure 2: Examples of the national economic value of wildlife[3]

Country	Economic contribution	Value (US$ mill)	Source
Botswana	Government earnings	3	(Modise 1990)
Kenya	Net annual economic gain	27	(Norton-Griffiths and Southey 1995)
	Contribution to GDP	5%	(Emerton 1997a)
	Contribution to formal sector employment	10%	
	Contribution to foreign exchange earnings	>1/3	
Namibia	Net value added to the national economy	68	(Ashley and Barnes 1996)
South Africa	National Park revenues	40	(Wells 1996a)
Tanzania	Wildlife utilisation	130	(Leader-Williams 1996)
Zimbabwe	Direct wildlife uses and products	139	(Muir *et al* 1996)

In order to justify wildlife conservation it is important to be able to demonstrate that wildlife generates these benefits. For governments of wildlife-rich countries to decide to allocate resources to conservation, wildlife must fulfil the conditions that:

$$\mathbf{TEB_w = Y_n+C_n+G_n+X_n+L_n+e_n} \quad \textbf{(2)}$$

where:
- Y_n = national income
- C_n = national consumption goods
- G_n = government revenues
- X_n = foreign exchange earnings
- L_n = national employment opportunities
- e_n = other national economic goals

These contributions of wildlife to national economies provide a powerful – and much needed – argument for allocating scarce financial, human and natural resources to conservation. Most economic approaches to wildlife conservation focus on demonstrating this economic value and on finding ways in which it can be captured as national economic benefits.

Wildlife benefits as an economic rationale for community conservation

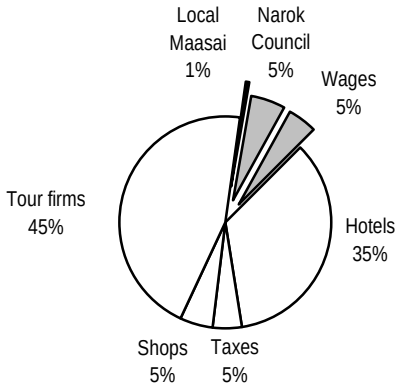
The economics of community conservation depends on the fact that wildlife can generate national benefits. If there is no domestic economic gain associated with wildlife then there will be insufficient arguments – as well as insufficient local incentives – either for conserving it or for communities becoming involved in conservation activities. It is however necessary to move beyond merely stipulating that wildlife contributes to national economic goals. The main concern in economic approaches to community conservation is not the total economic value of wildlife but rather the extent to which wildlife benefits actually reach the local residents of wildlife areas.

[3] Throughout this paper, local currencies have been converted to current US$.

This concern with distribution arises from the fact that although wildlife contributes substantially to the national economies of many East and Southern African countries, a high national economic value is not alone enough to ensure that it will be conserved. Wildlife economic benefits are unequally distributed, with community benefits typically accounting for only a small proportion of the total value of wildlife, as illustrated for the case of the Maasai Mara in Box 2. Most commercial wildlife tourism and utilisation opportunities accrue to national or international companies such as safari firms, tour operators, drug companies or overseas consumers (Wells 1996a, Leader-Williams 1996), and many wildlife option and existence values will be received by the global community or future generations. For example, commercial earnings from wildlife tourism in Botswana were worth more than eight times as much as government revenues in 1990 (Modise 1990), only a quarter of Namibia's wildlife income accrues to private farmers and less than 3% to communal landholders (Barnes and de Jager 1996). Local communities received less than 1% of all tourist revenues from the Maasai Mara National Reserve in Kenya in 1988 (Douglas-Hamilton and Associates 1988), 1% of revenues from Amboseli National Park in 1990 (Norton-Griffiths 1995) and only just over half of the revenues earned by government from hunting in communal areas of Zimbabwe in 1988 (Muir *et al* 1996).

Box 2: Distribution of tourism revenues to communities in Kenya

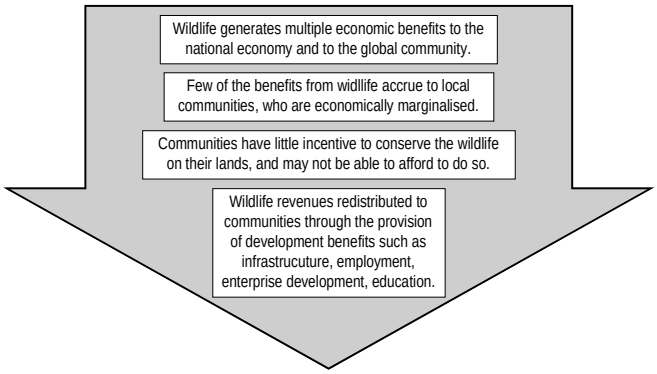
In 1988 the 122 500 visitors to the Maasai Mara National Reserve accounted for over a tenth of all tourist bednights in Kenya. In addition to spending money on accommodation and Reserve fees, tourists also directly supported a range of other enterprises, including balloon safaris, sales of handicrafts and various travel and transport-related purchases. Total tourist expenditure for the area was over US$ 26 million. However, although almost twice as many tourists visiting the Maasai Mara stayed – and most wildlife was found – on communal lands rather than in the Reserve, less than 1% of cash income accrued to local Maasai and under a tenth remained in the District as Council revenues or wages to local employees.



(Adapted from Douglas-Hamilton and Associates 1988)

This skewed distribution of wildlife benefits away from local communities is not only inequitable, it can actually discourage wildlife conservation. Commercial companies and the global community are not usually responsible for on-the-ground wildlife conservation. Even governments may have a limited role in wildlife conservation given their limited financial, manpower and institutional capacities and the physical distribution of wildlife populations. The majority of wildlife in East and Southern Africa is found on private and communal lands – for example in Kenya it is estimated that between 65% and 80% of wildlife is outside National Parks and Reserves (Ouko and Marekia 1996), and less than 10% of Namibia's wildlife is found inside formally protected areas (Yaron *et al* 1996). The survival of wildlife ultimately depends on the action of these landholders.

Figure 3: Benefit-based economic model of community wildlife conservation



Because wildlife is seen to generate local benefits and community welfare increases, landholders have an economic incentive to conserve wildlife.

As illustrated in Figure 3, benefit-based approaches to community conservation are based on the economic rationale that although wildlife has a high economic value, local communities – who are often already economically marginalised – receive little of this value, and therefore have little incentive to conserve wildlife because they do not economically gain from doing so. Benefit-based approaches require that wildlife conservation simultaneously generates national benefits (which will justify wildlife conservation overall), government revenues (which will provide funds to distribute to communities) and community benefits:

$$\mathbf{TEB_w = B_n + Y_g + B_c} \quad \textbf{(3)}$$

where: B_n = national economic benefits
Y_g = government revenues
B_c = community benefits

This requires a redistribution of wildlife benefits, which are currently balanced in favour of the people who live outside wildlife areas and often outside wildlife-rich countries. If wildlife has little or no value to local communities, there is no reason why they should conserve it. It is not in their economic interests to do so. At best they may be wildlife-neutral, at worst they may actively destroy wildlife. Even if – as is often the case – wildlife holds intrinsic benefits or local existence values, these alone may not be sufficient incentives for communities to conserve it: the absence of direct benefits may mean that they are unable to afford do so. The incidence of poverty and unemployment is high, and sources of income and subsistence are limited, throughout sub-Saharan Africa. The people living in wildlife areas are often the most economically marginalised and livelihood insecure sectors of the population. If wildlife cannot contribute sustainably to local livelihoods then it stands little chance of survival. Destroying wildlife will make far more economic sense than conserving it, and may sometimes be an economic necessity.

The implementation of benefit-based approaches to community wildlife conservation

The majority of wildlife conservation activities implemented over recent years in East and southern Africa have been at least nominally community-based, aiming to overcome inequities in wildlife benefit distribution. Most rely on indirect methods for distributing wildlife benefits to landholders, sometimes in combination with other community incentives such as permitting limited wildlife resource utilisation or employing local people as wildlife workers. They primarily operate in protected areas and their buffers, where income is collected by the state or some other authority through such mechanisms as entry charges, sales of wildlife products, or fees and levies raised on hunting, tourism and other wildlife-based activities. A percentage of these revenues are then channelled through some kind of fund, usually administered by local authorities or the national wildlife agency, which is earmarked for local community development activities such as infrastructure improvement and maintenance, educational bursaries or micro-enterprise development, and sometimes partially distributed as cash dividends to local landholders.

Box 3: Community benefit sharing in Kenya

Kenya Wildlife Service's revenue sharing policy uses a Wildlife Development Fund as a mechanism to distribute some of the revenues earned from protected areas to local communities. Initially this was based on a quarter of gate fees, subsequently revised. Between 1991 and 1995 over US$ 1.25 million was allocated to community-related activities in protected area buffers zones, including water, education, health, livestock and enterprise development as well as the provision of famine relief. Such revenue-sharing mechanisms currently operate in thirty three Districts of the country.

(Adapted from Barrow et al 1996)

This type of arrangement is typified by Kenya Wildlife Service's approach to benefit sharing, illustrated in Box 3. Other examples of benefit sharing and its impacts on community welfare and wildlife conservation are discussed in detail elsewhere, and include arrangements made under the Kenya Wildlife Service (Barrow *et al* 1996), South African Parks Boards (Wells 1996a, Davies 1993), Tanzania National Parks (Dembe and Bergin 1996, Leader-Williams 1993) and Uganda

Wildlife Authority (Barrow 1996) as well as under LIRDP and ADMADE in Zambia (Kapungwe 1996) and CAMPFIRE in Zimbabwe (Muir *et al* 1996).

Limits to benefit-based economic models of community wildlife conservation

Because most approaches to community wildlife conservation are based on sharing income as broad development benefits, their success has mainly been evaluated in terms of the total value of revenues and range of development projects initiated among the residents of wildlife areas. That benefit-based approaches have allocated substantial sums of money to community development activities, and have managed to involve local people in wildlife conservation at the same time as contributing to local development is well-documented (see for example Barrow et al's 1996 discussion of community conservation policy and practice in East Africa, Siachoono's 1995 discussion of the impacts of ADMADE in Zambia, Thresher's 1992 discussion of the impacts of revenue-sharing around Amboseli National Park in Kenya, Davies' 1993 discussion of the impacts of community involvement in conservation around Pilansberg National Park in South Africa – also illustrated in Box 4). For reasons which will be discussed below, it is however not self-evident that sharing wildlife revenues as development benefits will alone lead to a net economic gain for communities living in wildlife areas or encourage them to conserve wildlife. The provision of benefits to communities is undoubtedly necessary, but may not in itself be a sufficient economic condition for wildlife conservation – there are a number of other economic impacts of wildlife conservation which may counterbalance, or even negate, the gains from revenue-sharing arrangements. Benefit-based approaches only partially address the economic issues involved in community wildlife conservation.

Box 4: Community benefit sharing in South Africa

Pilansberg National Park in Bophuthatswana was one of the first efforts in South Africa to integrate community development with wildlife conservation. In an attempt to compensate local people for the loss of residence, grazing land and access to wild resources caused by the fencing of a large area as a National Park and to encourage them to support wildlife conservation, a range of benefit sharing arrangements were set in place by the park authorities through the formation of a Community Development Organisation. Activities undertaken included the development of local enterprises such as vegetable growing and clothing manufacture, the establishment of a community game reserve, employment, use of local contractors and infrastructure development. Surveys carried out before and after these arrangements were effected show a shift from an initially hostile reaction to the Park to a situation of strong support where almost 90% of local community members approved of the use of public funds to maintain the Park, nearly a third had visited it and half expressed willingness to occasionally work in the park on a voluntary basis.

(Adapted from Davies 1993)

Most importantly, purely benefit-based approaches to community wildlife conservation neglect the local economic forces motivating wildlife loss. Disbursing broad development benefits – such as infrastructure construction and maintenance, the provision of educational opportunities, employment generation and enterprise development – can and does improve community welfare, and lead to short term improvements in public attitudes to wildlife. However the assumption that this will change community behaviour over the long-term, and lead to a downturn in activities which impact negatively on wildlife, is seriously flawed because it fails to address the reasons why people engage in economic activities which destroy wildlife. Three important factors, addressed below, must be incorporated into economic approaches to community wildlife conservation because they help to explain the underlying forces motivating wildlife loss at the local level. These include the nature of livelihood systems in wildlife areas and the form in which wildlife benefits are received by communities, the costs that wildlife incurs on local livelihoods and the broader policy factors which influence local land use and economic activities.

The nature of livelihood systems in wildlife areas and the form in which wildlife benefits are received by communities

The physical and socio-economic conditions in wildlife areas generally mean that sources of employment, income and subsistence are scarce and livelihoods are insecure for the majority of the population. People engage in a range of economic activities in the search for secure livelihoods, and these activities in turn impact on wildlife – for example through resource over-exploitation, poaching

and the clearance of habitat for agriculture. Benefit-based approaches to wildlife conservation uncritically accept that broad development benefits are not only what communities need and want, but will somehow put people in a position where they do not need to destroy wildlife to achieve livelihood security. Yet the form in which benefits are shared under these arrangements – usually in the form of the provision of social infrastructure – rarely provides subsistence, income or secure livelihoods to the majority of community members in wildlife areas and thus may not generate incentives for community conservation, illustrated for the case of Zambia in Box 5. These forms of benefit-sharing arrangements rarely meet people's day-to-day needs for income, consumption goods and employment which cause them to engage in activities which damage wildlife:

$$\mathbf{B_c \neq Y_h + C_h + L_h + e_h} \quad \textbf{(4)}$$

where:
- B_c = community benefit-sharing provisions
- Y_h = household income
- C_h = household consumption
- L_h = household employment
- e_h = other household livelihood benefits

As well as the form in which wildlife benefits are shared with communities, the level of benefits generated may not be enough to compensate people for economic activities which interfere with wildlife. People may be unable to cope with the loss of income and subsistence generated by wildlife-damaging activities. The small amount of wildlife revenues allocated to communities is frequently not of a sufficient value – especially when shared between many community members – to allow people to be in an economic position to forego wildlife-damaging activities. People may also be unable to afford the high transaction or compliance costs of participating in community conservation, most importantly the time involved in attending meetings and carrying out conservation-related activities. Contrary to popular belief – that levels of underemployment are high and that time and labour are not binding constraints in rural subsistence economies – the opportunity cost of people's time in wildlife areas is high. In poorer regions, at times of stress or for more marginal social and economic groups, where people pursue multiple and continuous strategies in order to generate sufficient food and income, community members may be unable to afford the time to participate in community conservation activities unless they can directly compensate for productive activities foregone. Transaction costs accruing over the time allocated by community members to participating in community conservation activities thus fundamentally include:

Box 5: Community benefit sharing in Zambia

Two forms of benefit sharing operate in seven of the protected areas in Central, Copperbelt and Luapula Provinces of Zambia. ADMADE retains hunting rights and concession fees and half of animal licence fees from hunting in Game Management Areas through a Wildlife Conservation Revolving Fund, 35% of which is allocated to local community development activities. LIRDP sets aside 40% of revenues from culling, hunting, park entry and leases for community development activities. Together these funds helped to finance community development projects worth nearly US$ 0.25 million in 1996. Communities benefited from these developments, but it is not clear that they provided sufficient incentives for wildlife damaging activities to decrease. Although a major motivating force for wildlife loss in these areas is clearance of habitat for agriculture, unsustainable wild resource use and pressing local needs for cash income, there is only one case of community cash income generation and livelihood development through wildlife in all three provinces – the community-managed Nsobe self catering camp in Bangweulu Swamps, Luapula Province.

(Adapted from Kapungwe 1996, Emerton 1997c)

$$C_{ct} = Y_f + F_f + A_f + D_f + e_f \quad (5)$$

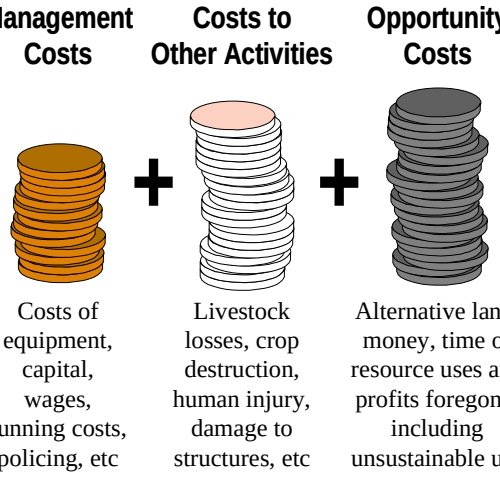
where:
- C_{ct} = the transaction cost of participating in community conservation activities
- Y_f = income-generating activities foregone
- F_f = food-generating activities foregone
- A_f = agricultural activities foregone
- D_f = domestic activities foregone
- e_f = other productive activities foregone

It is thus unlikely that sharing wildlife benefits as community development projects will lead to an overall decrease in wildlife-damaging activities, or increase in welfare, unless they meet livelihood needs and generate real income and subsistence products. These needs will vary within and between communities, and a single set of development benefits provided at the level of whole communities is unlikely to significantly improve individual or household economic welfare.

Community wildlife costs

Benefit-based approaches assume that converting a proportion of wildlife revenues into community development benefits will mean that wildlife becomes a positive economic asset for landholders. Yet wildlife benefits can never be seen as absolute. They can only be used as an incentive for community wildlife conservation if they are seen in relation to the costs that wildlife incurs. As illustrated in Figure 4, as well as the direct costs which have formed the focus of conventional economic analysis – the physical inputs required to conserve wildlife – the presence of wildlife gives rise to costs by interfering with other components of community livelihood systems. The total economic cost of wildlife (TEC_w) is the sum of all these values:

Figure 4: The total economic cost of wildlife



$$TEC_w = C_d + C_a + C_o \quad (6)$$

where:
- C_d = direct costs
- C_a = costs to other economic activities
- C_o = opportunity costs

Direct costs include the staff, equipment, infrastructure and maintenance associated with wildlife management. These costs can be substantial – for example total costs to Kenya Wildlife Service were over US$ 14.5 million in 1992, of which over half was spent directly on wildlife management and conservation and annual expenditure on rhino and elephant conservation alone were US$ 0.4 million and US$ 1.9 million respectively (Mwamadzingo 1992). The cost of managing Uganda's protected area network was over US$ 12.7 million in 1993 (Howard 1995), and direct expenditure on South Africa's National Parks was US$ 71 million in 1994 (Wells 1996a). Wildlife benefits must at least cover direct costs for conservation to be economically viable.

Wildlife areas in East and Southern Africa are primarily agricultural zones, supporting livestock and sometimes arable production. Wildlife competes with crops and livestock for land, water and other resources. Wild animals also cause direct damage to agricultural enterprises – through the transmission of disease to livestock, kills of domestic stock and crop destruction. The total cost of wildlife to agricultural production (C_a) can be disaggregated into:

$$C_a = ac_h + ac_v + ac_l + ac_t + ac_s \quad (9)$$

where:
- ac_h = harvest losses
- ac_v = veterinary costs
- ac_l = value of livestock kills
- ac_t = time spent in crop and livestock protection
- ac_s = damage to other farm structures

Figure 5: Examples of the overall economic cost of wildlife damage to agriculture

Country	Scale of wildlife cost	Value (US$)	Source
Malawi	National cost	17.3 million	(Deodatus 1996)
Namibia	East Caprivi villages	757/village	(Ashley and Barnes 1996)
Uganda	National cost	20 million	(Howard 1995)

As well as having a high overall economic cost, as illustrated in Figure 5, wildlife damage to agriculture also has major impacts on the production base of landholders. It can serve to make already insecure livelihoods even more marginal in economic terms. The livestock and crop losses caused by wildlife impact heavily on individual ranchers, pastoralists and arable agriculturalists, as illustrated in Figure 6.

Figure 6: Examples of the local economic cost of wildlife damage to agriculture

Country	Type of wildlife cost	Value (US$)	Source
Kenya	Laikipia disease transmission to livestock	37/km^2	(Grootenhuis 1996)
	Maasai Mara agricultural production costs	35-45%	(Norton-Griffiths 1996)
	Maasai Mara livestock disease, kills and injury	104/km^2	(Mwangi 1995)
	Maasai Mara crop damage	200-400/household	(Omondi 1994)
	Shimba Hills elephant crop damage	100/household	(PDS 1997)
Zambia	Mumbwa Game Management Area crop damage	122/household	(Siachoono 1995)

The land, labour, funds and other resources allocated to wildlife conservation have alternative uses elsewhere – for example protected areas could be given over to agriculture or used for other economic activities (as illustrated for the case of Kenya in Box 6), conservation typically precludes certain levels and types of wild resource utilisation, funds used to develop wildlife enterprise could be invested elsewhere in the economy. The opportunity costs of wildlife are the income and profits foregone from these activities which are precluded or diminished by allocating resources to wildlife conservation. They accrue mainly to governments – for the case of protected areas, and to local communities – both for the case of protected areas and for wildlife on private and communal lands. In East and Southern Africa, where wildlife areas predominantly lie in subsistence agricultural zones, agricultural production and local resource utilisation foregone are the most important components of the opportunity cost of wildlife conservation.

Box 6: The opportunity costs of wildlife conservation to Kenya

The net agricultural opportunity cost of alternative land uses and earnings foregone to the Kenyan economy from maintaining nearly 61 000 km^2 of land under protected areas is US$ 203 million, some 2.8% of GDP and equivalent to support to 4.2 million Kenyans. The combined net returns from wildlife and forestry of US$ 42 million is inadequate to offset these costs, at the national or household level. Because the chief value of Kenya's conservation activities is indirect and external, it is inappropriate that the costs should be wholly borne by the Kenyan government and domestic economy.

Protected areas	60 600 km^2
Potential human population	4.2 million
Potential livestock population	5.8 million
Potential cultivated area	0.8 million ha
Potential gross revenues	**US$ 565 million**
Potential net returns	**US$ 203 million**
Net returns from protected areas	**US$ 42 million**

(Adapted from Norton-Griffiths and Southey 1995)

Thus, for the majority of wildlife areas, the total opportunity costs of wildlife (C_o) can be disaggregated into:

$$C_o = oc_c + oc_l + oc_r \quad (10)$$

where: oc_c = crop income foregone
oc_l = livestock income foregone
oc_r = wild resource utilisation foregone

Destruction of wildlife and its habitat through agricultural conversion is widely cited as the single largest threat to wildlife in Africa (for example Boshe 1996, Child 1996, Wells 1996b). This is because the agricultural opportunity cost of wildlife areas is high, in cash and livelihood terms and at national and local levels, as illustrated in Figure 7.

Figure 7: Examples of the agricultural opportunity cost of wildlife

Country	Type of opportunity cost	Value (US$)	Source
Kenya	National opportunity cost of biodiversity conservation	203 million	(Norton-Griffiths and Southey 1995)
	Local opportunity cost of Maasai Mara wildlife conservation	27 million	(Norton-Griffiths 1995)
	Local opportunity cost of Mount Kenya forest and wildlife conservation	75 million 5 700/household	(Emerton 1997b)
South Africa	Local opportunity cost of Kruger	6 million	(Engelbrecht and van der
	National park wildlife conservation	5 000/household	Walt 1995)
Uganda	National opportunity cost of forest and wildlife conservation	110 million	(Howard 1995)

Wildlife conservation typically precludes a certain level of wild resource use, and protected areas often permit no extractive activities whatsoever. This can impose significant opportunity costs on adjacent communities and take away vital sources of subsistence and income including basic needs such as food, water, shelter, medicines, fuel and pasture as well as emergency fallback goods and services. As illustrated in Figure 8 the value of local wild resource use is high throughout East and Southern Africa, and loss of part or all of this utilisation imposes high costs on communities in cash and livelihood terms.

Figure 8: Examples of local resource utilisation values

Country	Type of wildlife value	Value (US$)	Source
Kenya	Aberdares forest local use	165/household	(Emerton and Mogaka 1996)
	Arabuko Sokoke forest local use	135/household	(Mogaka 1991)
	Kakamega forest local use	160/household	(Emerton 1992)
	Mau forest local use	350-450/household	(Lubanga 1991)
	Mount Kenya forest local use	300/household	(Emerton 1997b)
	Oldonyo Orok forest local use	100/household	(Emerton 1996)
South Africa	Natal Parks local resource use	0.5 million	(Wells 1996a)
Zimbabwe	Local bushmeat consumption	1 million	(Bojö 1996)

As is the case with benefits, wildlife costs tend to accrue unequally. Whereas communities often receive few direct wildlife benefits, they typically bear the full burden of the damage wildlife causes to other economic activities and the opportunity costs of alternative land uses foregone or diminished by the presence of wildlife. Communities in wildlife areas are often already economically marginalised and least able to bear these costs – even if they are willing to conserve wildlife, the costs to them of doing so may be insurmountable.

Consideration of wildlife costs thus forms a central part of the economics of community conservation. It also strengthens the argument for building community-benefit sharing arrangements into wildlife conservation. Benefit-sharing will however have only marginal impact on either community welfare or wildlife conservation unless it directly offsets wildlife costs. It is not enough to merely allocate a fixed proportion of wildlife revenues to community development activities – the

level and type of benefits provided must be closely tied to the magnitude of wildlife costs accruing to communities. Not only must benefits be provided to a sufficient level to balance the value of wildlife costs, but they must also be generated in a form which directly compensates for the economic activities precluded or diminished by the presence of wildlife. For local communities to be willing and economically able to conserve wildlife therefore does not just require that conservation generates broad benefits, but also must fulfil the additional conditions that wildlife benefits exceed wildlife costs:

$$\mathbf{TEB_{wc} > C_{cd}+C_{ca}+C_{co}} \quad \textbf{(7)}$$

where:
TEB_{wc} = total economic benefit of wildlife for communities
C_{cd} = wildlife direct costs to communities
C_{ca} = wildlife costs to other community economic activities
C_{co} = wildlife opportunity costs to communities

and that such benefits accrue to communities in the form of real financial or livelihood benefits which offset the financial and livelihood costs caused by wildlife:

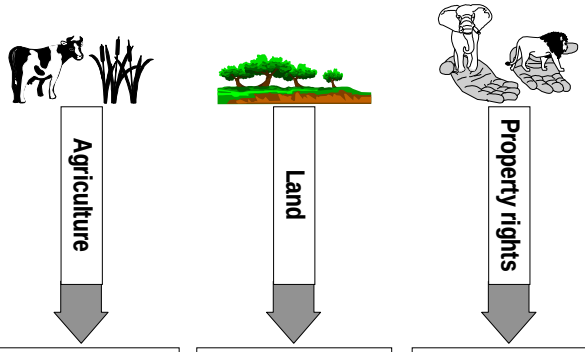
$$\mathbf{TEFB_{wc} \geq TEFC_{wc}} \quad \textbf{(8)}$$

where:
$TEFB_{wc}$ = the financial or livelihood form in which wildlife benefits accrue to communities
$TEFC_{wc}$ = the financial or livelihood form in which wildlife costs accrue to communities

Policy influences on community wildlife benefits and costs

Even where wildlife can generate high returns which accrue to local communities it still may not be considered a desirable use of land, resources or funds. Benefit-based approaches, while aiming to provide community conservation incentives by imbuing wildlife with economic value, ignore the fact that there simultaneously exist a range of economic disincentives to community wildlife conservation. Especially, a range of market, policy and institutional distortions in East and Southern African countries have discriminated against wildlife as illustrated in Figure 9, by increasing the opportunity cost of alternative land uses (Pearce 1996) and denying rights to own, manage or utilise wildlife to groups other than the state (Child 1996, Emerton 1997a, Muir *et al* 1996, Yaron *et al* 1996). These distortions have a net effect of decreasing the absolute and relative economic profitability of wildlife for landholders, as illustrated for the case of Namibia in Box 7. Giving communities in wildlife areas sufficient economic incentives for conservation is not just a matter of providing them with wildlife benefits, but also of recognising the perverse incentives which encourage them to engage in activities which deplete or destroy wildlife. Identifying and overcoming these policy distortions forms an important part of the economics of community conservation.

Figure 9: Major economic policy disincentives to community wildlife conservation



The dominant mode of production among communities in wildlife areas is livestock or arable agriculture. Macroeconomic and sectoral policies in sub-Saharan Africa have long been biased towards agriculture, imposing a range of price distortions which mean that wildlife is rarely able to compete fairly with agriculture because it is less profitable in financial terms. A range of subsidies and taxes have been set in place aimed at stimulating domestic crop and livestock production, with the aim of promoting national food security and foreign-exchange earning agricultural exports. Although the agricultural sector has been undergoing liberalisation in most parts of East and Southern Africa over the last decade, it is still protected in comparison to wildlife. Wildlife inputs are still more expensive in market terms, and their outputs cheaper, because they lack many of the subsidies provided to agriculture and are subject to many of the taxes from which the agricultural sector is exempt.

Box 7: The impact of market and policy distortions on wildlife profitability in Namibia

Although the level of agricultural sector protection has decreased in Namibia over recent years, there still exist a range of taxes, subsidies and foreign exchange manipulations which influence the profitability of wildlife-based land uses by driving a wedge between the financial profits landholders face and true social and economic values. These policy and market imperfections have a net negative effect for landholders by decreasing profits and increasing costs. The results of financial and economic analysis show that even where financial returns are low or negative for landholders, wildlife is socially and economically profitable. This demonstrates that policy and market distortions discriminate against wildlife-based land uses, and that wildlife deserves public policy support.

	Sheep/game ranch	Cattle/game ranch	Game lodge
Financial NPV/ha	US$ -4.3	US$ -10.1	US$ -13.5
Economic NPV/ha	US$ +5.1	US$ +1.4	US$ +18.1
Effect on costs/ha	**US$ +4.0**	**US$ +4.6**	**US$ +6.2**
Effect on cash income/ha	**US$ -2.2**	**US$ -2.7**	**US$ -2.7**

(Adapted from Barnes and de Jager 1995)

Heavy subsidies to the livestock sector, as well as export-led veterinary regulations which encroach on wildlife habitat and migration routes, have in Botswana (McNeely 1993), Namibia (Yaron *et al* 1996) and Zimbabwe (Muir *et al* 1996) encouraged the incursion of ranching into wildlife areas and diminished the relative profitability of wildlife-based land uses. In Kenya differential land-use taxes have made wildlife less profitable compared to crops and livestock (Vorhies 1996), reinforced by other subsidies to the agricultural sector such as duty and tax exemptions on imported agricultural equipment, low interest credit facilities, agricultural price fixing and protection against imported agricultural commodities (Emerton 1997a).

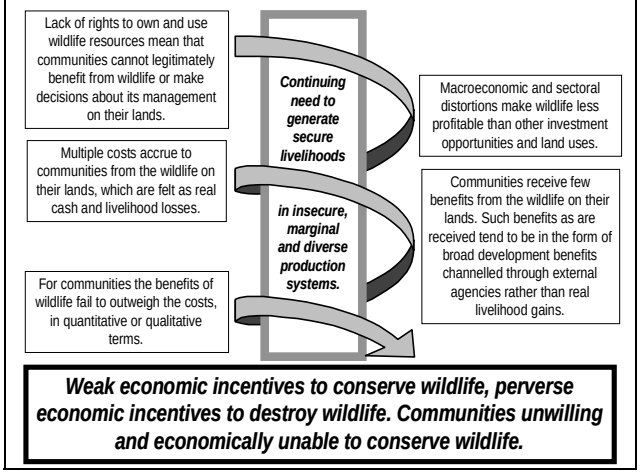
Forms of land tenure also tend to be biased towards settled agriculture, and have thus discouraged wildlife conservation. Throughout East and Southern Africa there has been a shift in land tenure systems towards consolidation and individualisation. Many wildlife areas which were formerly large, communally owned lands are now being sub-divided into small, individually owned farms or settlement schemes. The extensive tracts of land required to support wild animal populations are being physically demarcated and split into agricultural units which threaten wildlife, for example around the Nairobi National Park dispersal area (Gichohi 1996), the Maasai Mara National Reserve (Norton-Griffiths 1996), and the Amboseli-Tsavo region in Kenya (Southgate and Hulme 1996). Many land units are now smaller than the minimum viable area for wildlife populations (Barnes 1990, Howard 1995, Mwau 1996).

Policy factors which limit private property rights in wildlife and natural resources can also severely constrain the extent to which communities can benefit from the wildlife on their lands (Ashley and Barnes 1996, Child 1996, Emerton 1997). The traditionally heavy regulation of the wildlife sector in most East and Southern African countries, and the impact of lack of community rights to own, manage or utilise wildlife are discussed in detail elsewhere, and provide strong economic disincentives to community wildlife conservation. Even where wildlife can in theory generate high financial returns and compete with alternative land uses, local communities are often not permitted to legally capture these benefits.

Going beyond a benefit-based approach to the economics of community wildlife conservation

Several attempts have been made to go beyond a benefit-based approach to community conservation and to incorporate these additional economic considerations. An important element of these approaches has been their efforts to capture wildlife benefits as real cash values or livelihood support for local communities, in order to directly offset the tangible costs incurred by wildlife and enhance the ability of wildlife-based activities to compete with other land uses and livelihood elements. Most of these approaches also recognise the need to involve community members directly in conservation and grant some form of rights to manage and use the wildlife lying on their lands.

Figure 10: Multi-causal economic model of community wildlife conservation



Rather than the one dimensional benefit-based approach described above in Figure 3, these approaches to community conservation are based on the multi-causal economic model summarised in Figure 10 which recognises the need to overcome the many economic forces leading to wildlife loss at the community level and to see conservation within the context of providing secure livelihoods to the communities living in wildlife areas. These approaches accept, but go beyond, the single condition that wildlife conservation must generate national economic benefits, government revenues and community benefits:

$$\mathbf{TEB_w = (Y_n+C_n+G_n+X_n+L_n+e_n)+Y_g+B_c} \quad \textbf{(11)}$$

They also require that a number of additional conditions are fulfilled, that:

- Community economic benefits from conservation are as a whole greater than the total costs incurred to communities by wildlife:

  $$\mathbf{[B_c-C_{dc}-(ac_h+ac_v+ac_l+ac_t+ac_s)-(oc_c+oc_l+oc_r)] > 0} \quad \textbf{(12)}$$

- The net benefits accruing to participants from complying with a community approach to wildlife conservation exceed the transaction costs of their foregoing other productive opportunities in order to allocate time to wildlife-related activities:

  $$\mathbf{B_c-(C_{cd}+C_{ca}+C_{co}) > C_{ct}} \quad \textbf{(13)}$$

- Community wildlife benefits accrue as real financial and livelihood benefits to households:

  $$\mathbf{B_c = Y_h+C_h+L_h+e_h} \quad \textbf{(14)}$$

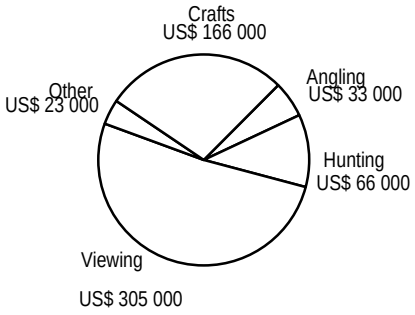
- No community member whose economic activities impact on wildlife is made tangibly worse off as a result of conservation:

  $$\textbf{for each } \mathbf{\textit{i}(\textit{i}=1, ..., \textit{i}=n)}, \ \mathbf{TEFB^i_{wc} \geq TEFC^i_{wc}} \quad \textbf{(15)}$$

Maximising wildlife values and using them as a direct means of livelihood support forms an important part of such approaches to community conservation. However great the demonstrated total economic benefit of wildlife is, these approaches require that a sufficient portion of this benefit is captured as financial benefits – such as income, consumption goods and employment – which are received by all landholders in wildlife areas to a level which exceeds the costs borne as a result of wildlife. Increasing the economic gain from wildlife for communities has also been achieved by moving away from traditional benefit-sharing arrangements, as illustrated for the case of Namibia in Box 8. Although most benefit-sharing activities are currently carried out by wildlife agencies or local government authorities, there is no particular reason why they should always be indirect or externally-implemented. The transaction costs of these arrangements tend to be high, the public sector is often already over-burdened and under-resourced, and benefits do not always reach all sectors of communities. Enhancing the ability of communities to directly generate income or livelihood benefits from wildlife themselves may be a more cost-effective and economically efficient way to implement benefit-sharing arrangements.

Box 8: Community wildlife income in Namibia

In four communal areas of Namibia communities gained benefits in excess of US$ 0.5 million in 1995 from wildlife through a series of arrangements including locally-controlled enterprise, employment and partnerships with government and the private sector. Income from wildlife is up to four times as high as the costs wildlife incurs at the household level. Potentially, community economic benefits from wildlife may become three times higher as community enterprises develop.



(Adapted from Ashley 1995)

Figure 11: Opportunities for direct community benefit generation from wildlife

Wildlife tourism

Private concessions
- Lodge employing local staff

Private investor
- Lodge pays bednight levy
- Safari operators pay entry levy

Partnership between investors and community
- Lodge established as joint venture
- Safari company includes community enterprise in package and pays for start-up investment or services

Locally-controlled enterprise
- Community campsite
- Community game reserve or conservancy
- Cultural centre
- Craft centre
- Local tourism guides
- Bed and breakfast in traditional home

Wild resource enterprise
- Commercial wildlife utilisation (e.g. ranching, cropping, farming)
- Processing and marketing of wild products (e.g. NWTP, live sales, hides, meat, trophies)

(Adapted from Wells 1996a, Ashley 1995)

Because many of wildlife values are unvalued or undervalued by the market, increasing the real benefit of wildlife for communities has also meant finding new markets, and diversifying or improving existing markets, for wildlife products and services. The direct products of wildlife – such

as tourism, hunting and cropping – currently form the major source of cash revenues and provide the major finance for community benefit sharing. The demand for these products is limited, and their revenues are not always enough to provide community benefits to a sufficient value, especially to balance the high cash costs of wildlife. As illustrated in Figure 11, direct community involvement in wildlife income generation can take many forms, ranging from pure community wildlife enterprise management to a range of partnerships and arrangements with commercial companies. That a variety of wildlife enterprise and sustainable wild resource utilisation arrangements can be profitable for landholders is well-documented (Ashley 1995, Barnes and de Jager 1996, Emerton 1997a, Muir *et* al 1995, Mwau 1996). Landholders in wildlife areas have often been excluded from wildlife markets for financial, human resources and institutional reasons. Enabling these kind of arrangements means providing local communities with the training, credit and market information to allow them to fairly compete or co-operate with other, more established, commercial and private-sector companies.

The privatisation of wildlife resources and enterprise has already occurred, albeit to a limited extent, in several East and Southern African countries. Although much of the direct participation in wildlife income-generation is still confined to large landholders and commercial farmers, the results of community forms of wildlife income generation are positive. Experiences of direct community participation in wildlife income generation demonstrate that these arrangements can be an effective way both of increasing community welfare and conserving wildlife. For example under the Chobe Enclave Project in Botswana communities have entered into a joint partnership with a local safari operator to manage their wildlife quota, earning cash returns of over US$ 100 000 in 1996 (Modise 1996). It has been estimated that in Namibia direct revenue-sharing and partnerships between local communities and tour operators can generate for a single village up to US$ 20 000 in wages, up to US$ 20 000 in other local income and between US$ 150-250 per household in sales of handicrafts and souvenirs (Ashley 1995). In Namibia (Yaron *et al* 1996) and Zimbabwe (Muir *et al* 1996), much of the recovery of wildlife populations over recent years has been attributed to the shift in wildlife management and utilisation from the state to the commercial sector and landholders in wildlife areas.

Conclusions: assessing the economic impacts of community wildlife conservation

One-dimensional, benefit-based approaches have formed the guiding principle for many of the community wildlife conservation activities implemented in East and Southern Africa over the last decade. Most of these activities aim to redistribute wildlife revenues to local communities as broad development benefits. This paper has argued that although the economic rationale to benefit-based approaches to community wildlife conservation is sound – if local communities do not benefit from wildlife they are unlikely to be willing or able to conserve it – it is incomplete. Generating broad development benefits does not ensure that the presence of wildlife generates a net local economic gain and is not the same as providing economic incentives for conservation.

Because of their narrow conceptualisation of wildlife benefits, it is difficult to assess whether such conservation initiatives have made actually communities in wildlife areas economically better off. There are few – if any – cases where economic analysis of the impacts of wildlife conservation has been carried out. It has merely been assumed that generating benefits for local communities is an indication that such activities have been successful in conservation and development terms. In order to assess the economic impacts of conservation initiatives it is necessary to go beyond assessing the magnitude of benefits distributed to communities in wildlife areas. We have argued in this paper that benefit-sharing forms a necessary, but rarely a sufficient, condition for local communities to economically gain from wildlife conservation. Judging the success of community conservation in terms of development benefits generated may neither indicate that community welfare has improved or that the local economic conditions which will lead to wildlife conservation have been set in place. Even when the people in wildlife areas are furnished with community development benefits, frequently they still lose out in economic terms from the presence of wildlife.

There are multiple economic conditions which are necessary for successful community wildlife conservation, of which benefit sharing is but one. A range of other economic factors need to be incorporated into benefit-based approaches to community wildlife conservation, and used to evaluate their success. At the least these factors include consideration of the costs associated with wildlife and their distribution, the level and form in which community benefits are received, the degree to which communities have economic choice and control over wildlife management, use and benefit generation and the wider policy factors which discriminate against wildlife as a profitable land use for communities. Which combination of conditions are sufficient to ensure that people are economically better off in the presence of wildlife and have economic incentives to conserve wildlife will vary between and within communities. Communities are heterogeneous in their composition, their aspirations and in the wider economic conditions they face.

Community approaches to wildlife conservation can be judged to be economically successful if they not only generate benefits but also ensure that these benefits are of a sufficient value, and accrue in an appropriate form, to offset the costs that wildlife incurs on communities and to make wildlife an economically viable land use compared to other wildlife-damaging livelihood alternatives. Providing communities with economic incentives to conserve wildlife means ensuring that they are better off in financial and livelihood terms with wildlife than they would be without it, at the same time as overcoming the root economic factors which cause them to engage in economic activities which threaten or deplete wildlife resources.

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