

[Wildlife in the Landscape – A summary of issues in Kenya in the 1990s

Based on excerpts from MSc thesis]

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Ecological Monitoring for Management of Community Conservation in Kenya

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A report submitted in partial fulfilment of the requirements for the MSc and/or the
DIC.

September 1993

EXCERPTS & REFERENCES

INTRODUCTION

Context

The first efforts made to conserve large mammal communities in Africa were the declaration of wildlife laws prohibiting traditional forms of wildlife utilisation, and the subsequent creation of protected areas (here referred to as "parks"¹).

Most parks are too small to function as autonomous ecosystems; rather they are components of ecosystems which extend into surrounding landscapes. These landscapes support ecological processes like wildlife dispersal and migration and provide sources of new colonists following local extinctions. The effects within the parks of episodes of over-population, resource stress, habitat transformation and extinction are modulated by the degree of wildlife access to surrounding lands.

In Kenya and most other African countries, human settlement and land use change are fragmenting natural landscapes and making parks increasingly insular. With the loss of "ecological communication" of parks with the surrounding landscape, wildlife managers are confronted with the need for intensified intervention in parks' ecology in order to maintain their conservation effectiveness. Intensive management of wildlife populations in parks has been practised for many years in southern African countries and is becoming more necessary in Kenya (see Appendix 2).

Wildlife laws, which usually made wildlife State property and prohibited its traditional utilisation, greatly reduced its value to rural people. The costs of wildlife are rising as human population growth increases the frequency of conflicts with wildlife. People living around parks have not had a fair share in the new benefits of

conservation. Thus, while they influence the wildlife carrying capacity of a landscape, rural communities have no vested interest in conservation, and commonly pursue land uses which are incompatible with the presence of wildlife.

Attempts to solve these problems have been made in various African countries over the last twenty years. The common feature of these has been increased participation by local people in the management of conservation schemes.

Overall, few initiatives have been successful in establishing effective management by local communities of their wildlife resources, perhaps the only exceptions being Zambia and Zimbabwe. Now a similar approach is being initiated in Kenya through the Kenya Wildlife Service (KWS) Community Wildlife Programme. The philosophy is centred on restoring wildlife's value to African landowners, enabling them to exploit wildlife sustainably and encouraging land uses incorporating conservation where these generate higher incomes than current practices.

In particular, this will apply in the semi-arid rangelands which traditionally have been used for pastoralism and are now being converted to unsustainable agriculture by settlers from over-populated high potential areas. Arid and semi-arid lands cover about 70% of Kenya's surface and support abundant populations of large mammals.

Where appropriate, KWS's Community Wildlife Programme will enable rural people to utilise and benefit from the wildlife on their lands. The aim is an end to undervaluation of the wildlife resource and a corresponding extension of conservation into the general landscape. As well as improving the quality of life of rural people in these areas, an increase in the landscape's wildlife carrying capacity might also reduce the intensity of management needed within the parks.

The success of the Community Wildlife Programme will depend on local landowners' participation in the management of wildlife utilisation and on equitable distribution within communities of the benefits produced. Most rural communities currently lack the capital, skills and technology to manage wildlife and therefore will need assistance.

An important aspect of any management system should be ecological monitoring: to ensure that wildlife utilisation is appropriate and to understand its effects on the ecosystems under exploitation.

REVIEW

The discussion concentrates on savanna regions (Pratt, Greenway and Gwynne, 1966; Vesey-Fitzgerald, 1976; Cole, 1986) of Africa. The emphasis is on Kenya, but examples are drawn also from Tanzania, Zambia, Zimbabwe, Botswana and South Africa. These countries have designated over 9% of their combined land surface as parks (17% in Botswana and 12% in Tanzania), which compares with 3% for Africa as a whole².

Ecological limitations of the "sanctuary approach"

Ecological representativeness of parks

Half of the parks in Africa were designated while the continent was under colonial occupation, and the remainder established after independence (Adams and McShane, 1992, p 230). Most are less than fifty years old (Myers, 1972), though some have earlier origins (Grove, 1987; Dasmann, 1964).

Effective conservation of biodiversity requires a parks system including representative examples of the important ecotypes in a region, with emphasis on examples of high species diversity and endemism (International Union for the Conservation of Nature and Natural Resources, IUCN, 1990). Most sites for parks

were selected on other criteria: they were designated in lands viewed as useless for agricultural or other development (Sheldrick, 1973; Martyn, 1991).

This is an apt definition of the savannas (Cole, 1986) and so the parks in east and southern Africa provide good representation of this ecotype, but ecotypes in higher potential areas, such as forests and wetlands, are under-represented (KWS, 1990).

Inadequate size of parks

Since the 1950s, scientists have conducted ecological research in the parks (Dasmann, 1964; Sinclair, 1979, pp vii-ix). Recently, theoretical approaches such as island biogeographic theory (MacArthur and Wilson, 1967; Diamond, 1975) and conservation biology (Soulé, 1987) have been applied. The scientific attention has highlighted inadequate size as the main ecological limit on parks' ability to conserve large mammals. Myers (1972) argued that savanna parks "could hardly ever be big enough".

Savanna mammals are highly mobile. They require large areas of land and their distributions are changed by seasonal movements in response to factors including availability of water, food and minerals (Walker, 1989; McNaughton, 1990). Regular or unpredictable long-range migrations may occur (Maddock, 1979; Spinage, 1992).

East (1981) proposed that only parks of more than 10,000 km² could support large mammal communities in self-sustaining ecosystems, noting that even these large areas would be insufficient to support mobile species with low population densities, such as the wild dog, *Lycaon pictus*, or the cheetah, *Acinonyx jubatus*.

Species which undertake long-range migration are especially difficult to contain in parks. Each year migrating wildebeest, *Connochaetes taurinus*, move in

increasing numbers into the lands outside the contiguous Serengeti (Tanzania) and Maasai Mara (Kenya) parks (ole Parkipuny, 1991). These parks cover about 17,000 km² , but still are too small to contain the migrating populations.

Elephants *Loxodonta africana* often move out of the parks. In Kenya, traditional elephant migration routes include those from the Aberdares park to Mount Kenya and Samburu (Ogle, Munyugi pers comms), from Tsavo West park into Tanzania and from Amboseli to Tsavo West (Changai, pers comm). No park could encompass these huge areas.

Some ecosystems may be quite small. Western (1975) showed that about 80% of the large mammals in Kenya's Amboseli ecosystem move seasonally within an area of 5,000 km². However, the area of the Amboseli park is only 392 km².

The inadequate size of parks becomes a severe ecological limitation when they are barricaded from surrounding lands. In this situation, they can support only a fraction of the mammal populations which can survive when access is unimpeded to the general landscape (Western, 1989).

As noted above, in Amboseli large herbivores disperse in the rainy season over 5,000km² of pastoral ranchland but in the dry season concentrate in the smaller Amboseli lake basin. Western (1975) estimated that the large herbivore population would decline by 40-50% if permanently confined to the dry season refuge in the central 600km² of the basin. Thus, if the herbivores were limited to the even smaller Amboseli park a population decline of more than 50% might be expected.

The need for management in parks

Large mammalian herbivores modify the carrying capacity of the savannas by transforming their physical and biotic structure (McNaughton and Georgiadis,

1986; Owen-Smith, 1988). For instance, Parker suggests that at one time there probably was a landscape-scale cycle of elephant-mediated conversion of woodland to grassland, with the conversion in each locality being reversible when elephants moved to other compartments of the ecosystem (???) in Parker, Ivory Crisis).

Amongst ungulates, various "grazing successions" occur, in which utilisation of a particular vegetation type modifies stand structure and composition, providing conditions favourable to a succeeding herbivore species (Vesey Fitzgerald, 1976; Jarman ???).

Processes of herbivore-mediated habitat transformation probably occur at all scales, from the microscopic to the landscape-level. They change the wildlife carrying capacity of habitats, and influence other ecological characteristics such as species diversity. Western (1989a) noted that diversity of plant and animal communities is greatest where elephant densities are intermediate between the very high and low levels typically found inside and outside parks respectively.

The extent and form of the habitat change must depend partly on the vegetation and herbivore communities involved. The course of the changes would be influenced by ecological processes such as competition and predation; and by climatic and physical factors, of which in savanna ecosystems the two most important are rainfall and fire. Walker (1989) gives an example of how the [emergence and survival of even-aged stands of] mature woodland in a park in Botswana is probably [determined not purely by elephant density but by a combination of factors including a long term episode of low densities of mammalian herbivores in general, possibly related to drought, and as such is probably a quite unstable/transitory equilibrium state].

The effectiveness of a park in conserving examples of high species diversity will depend upon its resilience in accommodating such ecological disturbances. These are occurring at accelerating rates due to human development of landscapes

around parks. Elephant populations "compressed" from landscapes into parks cause habitat damage by over-browsing (Laws, 1981). In large parks the changes may be partially or wholly reversible and have little or no long term effect on carrying capacities. For instance the 11,000 km² Tsavo East Park still exhibits the effects of the drought and elephant compression which destroyed woodlands in the 1970s, but retains important wildlife populations (Nyeki, 1992).

However, in smaller, isolated parks habitat damage and loss of carrying capacity may be irreversible in the time frames used by wildlife managers. Rare species are vulnerable to catastrophe, the park is less accessible to colonists and the probability is increased of local extinctions (Gilpin, 1987). In such circumstances human intervention is felt necessary to preserve "desirable" characteristics of the system such as species diversity or the existence of a certain habitat type.

Intensive management of wildlife populations in parks is established practice in southern Africa. It has been applied only in exceptional cases in Kenya though Caughley (1981) pointed out that high levels of poaching in east Africa constituted informal management of sorts. In Kruger park in South Africa, where the management policy is "minimum interference", elephant, buffalo *Syncerus caffer*, and hippopotamus *Hippopotamus amphibius*, populations are maintained by cropping programmes (Trollope, 1990).

In Kenya, ecological problems such as elephant compression and habitat destruction (Shimba Hills), and overpopulation of species such as waterbuck (Lake Nakuru), zebra *Equus burchelli* (Maralal) and warthog *Phacochoerus aethiopicus* (Lake Nakuru) are problems facing managers of these areas. Other management needs are listed in Appendix Two.

Social limitations of the "sanctuary approach"

The social factors limiting the effectiveness of the sanctuary approach to wildlife conservation are population growth, land use practices, inequity in the distribution of benefits from wildlife and little popular interest in conservation.

Human population growth

Human occupation lowers the wildlife carrying capacity of an area (Eltringham, 1990). Parker and Graham (1989) showed inverse relationships between human and elephant densities in Kenya and Zimbabwe.

In Kenya the human population was 4.8 million in 1948, when the country's first parks had just been created. The current population is in excess of 24 million³. As well as placing a great strain on the nation's infrastructure and services, this high population growth rate has forced extension of settlement, expansion of food production and the adoption of unsustainable land uses in semi-arid lands. This has fragmented natural landscapes and made parks more insular.

As Kenya's economic growth has been outstripped by its population growth, each person is depending on a proportionally smaller resource base. Competition for resources has intensified. The majority of rural Kenyans are struggling to maintain a subsistence standard of living. Such a socio-economic climate does not engender long-term planning for sustainable use of natural resources, which may entail lifestyle changes and short-term costs which represent a high risk to peasant farmers.

Land uses conflicting with wildlife

Cultivation

In Kenya less than 20% of land is classed as naturally arable (Miller, 1986) and the country has an arable land per capita ratio of 0.3 hectares per capita, compared with an African average of 1.6 ha per capita. The distribution of this land is skewed, with 50% of land occupied by 5% of farms and 30% of the smallest farms occupying 2% of farmland ⁴.

Population growth has created pressure for increased food production and for private ownership of arable land. In productive agricultural lands human population densities are high, crops are grown wherever possible and the wildlife carrying capacity is low. Settlements and agriculture line the boundaries of the few parks in these regions, most of which are small and completely or partially fenced. In Kenya, Lake Nakuru (188 km²) Shimba Hills (192 km²) and Kakamega (45 km²) are examples.

The main human-wildlife conflicts in agricultural areas arise through crop damage. This occurs all over Africa (Newmark et al, 1992; Balakrishnan and Ndhlovu, 1992; Parry and Campbell, 1992). In Kenya, many species of large mammal cause crop damage, including elephant, buffalo, zebra, warthog, porcupine *Hystrix galeata* and various antelope and primate species.

These animals [may] originate from resident wildlife populations in local protected areas such as parks, forests or private game reserves. They are attracted to cultivation by the abundance of palatable food there. Dispersing or migrating animals like elephants, zebras, buffalo and large antelope species may pass through cultivation as they attempt to follow migration routes through the area (Kaaria, Ogle, Munyugi, pers comms).

[deletion] Resident wildlife causes year round problems, whilst migratory wildlife causes more seasonal problems. Resident and transient animals may be in an area at one time (Ogle, pers comm). In high potential areas like Shimba Hills there is always something in the fields to attract wildlife (Mwathe, pers comm) and so the damage occurs on a year-round basis.

Kirimi (1991) and Ngure (pers comm) described direct and indirect costs of wildlife damage in agricultural communities. Direct effects are loss of crops and injury or death to people trying to protect their property ^{5,6}. Indirect social costs include sleepless nights for families guarding crops, and missed education for children unable to walk safely to school due to wildlife in the area.

[FOOTNOTES 5 & 6

⁵ Elephants killed the following numbers of people in Laikipia District:

five in 1990;

nine in 1991;

nineteen in 1992;

seven in the year to 1/7/93.

Source: Laikipia Elephant Project, KWS.

In Taita Hills, elephants killed three people in the period March-May 1991. Source: (Ngure, pers comm).

⁶ In three of the areas visited during this study, human fatalities caused by wildlife had been reported in the month preceding the visit.]

Given the shortage of arable land in Kenya and the government policy of achieving food self-sufficiency, it is difficult to justify a place for large parks or large wild mammals in high potential areas and it seems appropriate that efforts intensify to exclude harmful large mammals from these landscapes.

Pastoralism

Most (70%) of Kenya is arid or semi-arid, supporting 20% of the human population. Pastoralism has been the dominant land-use for 2-3,000 years in these zones (Western, 1989; Homewood and Rodgers, 1987). Traditional pastoralism is a low-intensity land use which does not exclude wildlife. Large wildlife populations persist in the semi-arid lands of Kenya (Mbuvi and Croze, 1986). Western (1989) estimates that in these rangelands, 75% of large mammals occur outside the parks.

When parks were created it was mostly the land of pastoralists (mainly the Maasai pastoralists in the southern half of the country) which was alienated. Other large areas of Maasailand were converted to commercial ranches and plantations during colonial times.

At formation, savanna parks were surrounded by intact landscapes, and the lack of congruence between ecosystem and park boundaries was not a limit to their ability to support wildlife (Wilcove and May, 1986). The savanna parks of Tanzania and Kenya still support the most spectacular large mammal communities on earth.

Demographic and social changes in the pastoral lands are making contemporary pastoralism to less compatible with wildlife. Population growth and high population densities in the arable areas are forcing agriculturalists to settle in the marginal savannas, where areas of rain-fed and irrigated agriculture are developing. Odingo (1988) pointed out that cultivation of these lands carries a high risk of causing serious environmental damage.

These changes have been accelerated by entry of pastoralists into the cash economy. Much of Maasailand is now partitioned into group ranches and registration of individual title within ranches (KWS, 1990; ole Parkipuny, 1991) has created a real estate market (Sindiga, 1984). Maasai landowners are leasing or selling land to agriculturalists, or offering plots as loan collateral. Plots range from

smallholdings to large wheat farms in areas like Maasai Mara, where wheat farming is undertaken as highly profitable speculation on rented land, and Maralal (pers obs).

Similar changes have occurred in pastoral areas in the central Rift Valley. In northern pastoral regions such as Samburu these changes are less advanced (Munyugi, pers comm) but nevertheless are underway and can be expected to pose equally serious threats to wildlife.

Sub-division of the semi-arid lands by land investment companies which sell small plots is a particularly serious problem. In Laikipia, various subdivision schemes have produced small plots (some less than two acres) in lands which are useless for agriculture (Aggarwal, pers comm). Purchasers are mainly from the high-potential areas. Agriculture attempted on these semi-arid lands is likely to be unsustainable (Kaaria, pers comm), but for many purchasers a greater motivation is the first chance to own land and a home . Other buyers use the plots to speculate on the real estate market (Ogle, pers comm).

Widespread fencing of plots is one aspect of the loss of landscape integrity which threatens wildlife (KWS, 1990). However perhaps a more serious threat is a loss of management integrity as land ownership is transferred from traditional communal system of management to a much less cohesive system. Within the pastoralist community, the establishment of new institutions such as group ranch committees has taken traditional authority away from the family and the homestead and created confusion over who is in charge of grazing control and natural resource management (Little and Brokensha, 1987).

The area has decreased which is available for pastoralism, while pastoralist populations have increased (Talbot, 1986). Some pastoralists have demarcated areas of communal land as their private ranches. This has compromised the effectiveness of communal management, leading to over-utilisation of pasture and

increasing illegal incursions of livestock into parks (Boshe, 1989; KWS, 1992a, Kuruta, pers comm).

The reduced flexibility of pastoralists increases the intensity of conflict with wildlife. Prins (1992) points out that co-existence of pastoralism with wildlife cannot persist when human population densities increase. Conflict of wildlife with livestock is claimed to arise through transmission of diseases (Boshe 1989; Eltringham, 1990) and competition for grazing (Eltringham, 1990) and water (Enghoff, 1990). Wildlife can also pose a danger to people involved in tending livestock.

Mbuvi and Croze (1986) have disputed the significance of wildlife in transmitting disease, suggesting the problem is exaggerated. Rossiter (1984) points out that effective livestock vaccination is more important than excluding wildlife in the case of diseases like rinderpest.

While ecological separation of wild herbivores facilitates partitioning of savanna production so that interspecific competition is minimised (Jarman and Sinclair, 1979), it cannot completely remove it. For example, at high population densities, wildebeest compete with buffalo (Sinclair, 1979). This suggests that high densities of wild herbivores compete with cattle, a view that is held by the Maasai (ole Parkipuny, 1991), the Samburu (Munyugi, Letolua, pers comms) and commercial ranchers (pers obs). Child (1990) maintains that at moderate stocking levels there is little competition between wildlife and livestock.

Commercial ranchers suffer damage by large animals to fences, water pipes and crushes (Omari, Kala, pers comms). Pastoralist herders and workers on ranches occasionally are injured or killed by wild animals (ole Nashuu, Omari, pers comms). Though they take comparatively little stock in comparison to other causes of mortality (Mills, 1992), predators may be viewed by pastoralists and commercial ranchers as pests to be exterminated (Bulger, pers comm; Childes, 1988; Mills, 1991). Predators occasionally may be a danger to humans (Changai, pers comm).

Rangeland development lowers wildlife carrying capacity. In Tanzania, migration routes around Tarangire park have been increasingly obstructed by fences and agriculture since 1975 (Borner, 1985). Settled cultivation around Maasai Mara (ole Parkipuny, 1991) and Amboseli (Lindsay, 1987) are examples of similar situations in Kenya.

Wildlife migrating over long distances is especially exposed to these factors. In Botswana, conflict with stock farming and obstruction of migration by veterinary cordon fences have endangered the once super-abundant Kalahari wildebeest and reduced numbers of many other species. In Kenya, fencing in the Rift Valley in the 1920s prevented wildlife migrations (Spinage, 1992). Extensive fencing in other regions could be expected to have similar effects.

Land use changes in the pastoral lands are adding wildlife conflicts more usually associated with agricultural areas to those already present. Rain-fed agriculture in the savannas is risky even without loss of crops to wildlife (Mbuvi and Croze, 1986) and so immigrant cultivators are especially sensitive to crop-raiding, and may abandon badly-affected smallholdings (pers obs). Where cultivation is rain-fed the crop damage is seasonal but in irrigated areas it occurs on a year-round basis (Kaaria).

As most of the country's wildlife resides in the semi-arid lands, exclusion of wildlife to protect areas of agriculture here is harder to justify than in the high potential areas. Multiple land-use systems incorporating wildlife utilisation, livestock and limited cultivation may be the most sustainable and profitable options in these areas (Child, 1990; Cottar, pers comm). However, until such systems have proved their worth, there will be little incentive for land owners to adopt them, or for those involved in national planning and development to consider them seriously.

Intensification of human-wildlife conflicts will then continue to reduce the wildlife carrying capacities of these important savanna lands.

Inequity in the distribution of benefits from wildlife

Park formation was usually preceded by game laws (Grove, 1987), which made it illegal for indigenous people to hunt wildlife (Lusigi, 1981). Hunting was permitted by licences priced out of the reach of Africans (Grove, 1987), who became resigned to jail sentences if caught poaching (Sheldrick, 1986). Subsistence hunting continues in many African parks and provides an important source of protein, especially for the poorest rural people (Parry and Campbell, 1992; Balakrishnan and Ndhlovu, 1992).

Resources like important grazing lands (Lindsay, 1987), foods, fuel and construction materials (Infield, 1988) were alienated by the parks (Armstrong, 1991). Generally no compensation for the loss of these resources was provided.

On designation as parks the purpose of areas was transformed from provision of subsistence resources for local inhabitants to provision of aesthetic benefits for foreign visitors (Fourie, 1991). The leisure benefits provided by parks have remained beyond the reach and interests of rural people, according to Lusigi (1981).

Scientific investment has largely bypassed local people. In Serengeti, researchers brought in funds worth \$50km⁻² in 1989/90, whilst the management authority budget was \$20km⁻². Most of the research carried out was "irrelevant to conservation" (Leader-Williams, 1991).

Most parks in Africa lose money (Bell, 1987). In a typical example in Zambia's Luangwa Valley, conservation authorities could afford less than 10% of the expenditure needed to protect the black rhinoceros *Diceros bicornis* from poaching (Leader-Williams, 1990). Sub-optimal anti-poaching effort allowed subsistence hunting to continue, while lack of alternative benefits encouraged local

people to take up employment opportunities with commercial poachers (Lungu, 1990).

Some parks generate profits, however, and Kenya is the continent's foremost earner from wildlife tourism (Child, 1990). Tourism creates employment opportunities and stimulates local economies. Local people benefit from tourism in Kenya (Mbuvi and Croze, 1986), Tanzania and Rwanda (Pennington, 1983; Weber, 1987 in Newmark et al) and southern Africa (Child, 1990).

However local rural economies typically receive only a fraction of the value of their wildlife resource (Child, 1990). A key factor in this is the vast difference between African and European perceptions of the value of wildlife. For most rural Africans it is incomprehensible that someone from Europe will spend the equivalent of two or three year's local income to look at wildlife for one or two weeks, while the European feels this is good value for money. Tour operators are aware of both value systems and can exploit the difference to generate high profits. Most tourism operators are based overseas and repatriate much of their income, contributing to the leakage of foreign exchange common in most closed African economies (Child, 1990).

Over-reliance on tourism can create problems when forecast numbers of visitors fail to materialise (Lindsay, 1987, Jacobs, pers comm); and cultural(ole Kaisiario and ole Rokonga, undated) and ecological (Myers, 1972; KWS, 1993) problems if the industry is not sensitively regulated .

There have been schemes in Kenya intended to re-direct park revenues from tourism into local communities, but generally these have failed. Maladministration of income distribution schemes has denied benefits to local people in Amboseli (Lindsay, 1987) and Maasai Mara (pers obs), which are two of the most profitable parks in Kenya. Where benefits are provided these often are inappropriate, having been carried out without consultation with local people (Munai, pers comm).

It seems reasonable that local people should judge parks by the material, cultural and other benefits generated from the wildlife they contain. In general, people living around parks have not received benefits commensurate with their investment in surrendering subsistence resources and tolerating wildlife on their land.

Popular support for conservation

Rural Kenyans feel that, as State property, wildlife provides them with no benefits (Ngure, pers comm). In rural Kenyan society, land and wildlife are viewed as commodities rather than a resource base for recreation, according to Lusigi (1981). A survey in Botswana suggested similar attitudes there (Parry and Campbell, 1992). In Zimbabwe, Gutto (1989, quoted in Hill, 1991) said "conservation is a religion through which a wealthy elite worship nature". Foreigners and urban elites have been the main supporters and beneficiaries of the parks (Beinart, 1987).

But Bell (1987) cites the popularity in Zambia of education programmes involving local people in park visits as evidence for popular aesthetic enjoyment of wildlife, and according to Mbuvi and Croze (1986):

"Wildlife is part of the natural scheme of life...there is a deep moral and spiritual attachment contemporary African lore and moral perceptions are richly structured with parallels from the animal world"

A review of attitudinal surveys (Newmark et al, 1993) suggested that the majority of people near parks in Tanzania (Newmark et al, 1992; Newmark and Leonard, 1991; Pennington, 1983) and Rwanda (Harcourt et al 1986; Weber, 1987) are opposed to their abolishment. One of the studies (Newmark et al, 1991) showed that support for parks was least among groups who had suffered eviction from the parks or wildlife damage.

In Swaziland, interviews with rural people indicated general support for conservation, provided that parks are small, remote, on non-arable land and subordinated to economic development. Most respondents felt that Swaziland's most important park should be converted to estate agriculture (Hackel, 1990).

A cautious interpretation of these results is that African people are ambivalent towards wildlife, providing they are suffering no wildlife costs.

Conclusion

The sanctuary approach has many shortcomings, but the parks should not be viewed as failures. They have played a vital role in protecting biological communities which might otherwise have disappeared. In Kenya, the small Shimba Hills park contains the country's only population of sable antelope *Hippotragus niger*, and the even smaller Kakamega forest park contains Africa's easternmost remnant of the rain forest which once extended from the Congo basin (Williams, 1981).

The value of the parks cannot be measured in economic terms - the majority will never be profitable and will depend on subsidy (Bell, 1987). Their effectiveness will be diminished if human land uses in surrounding lands cannot be made more compatible with conservation, which will depend on reversing the historical devaluation of wildlife. By enabling people to benefit directly from animals on their land, the wildlife carrying capacities of landscapes can be increased.

In these situations economic judgements should be applied and wildlife management adopted where it is more profitable than existing land uses. Systems incorporating wildlife utilisation should have the advantage over current practices in the semi-arid lands of Kenya, but will not displace agriculture in the high potential areas.

The effect of broadening the base of wildlife beneficiaries should be to also broaden the base of support for conservation, and this is the aim of the KWS community wildlife programme.

Community Conservation in Kenya

Brief history of community conservation in Kenya

It is worthwhile to briefly consider some early efforts at community conservation in Kenya, as they provide lessons for future initiatives.

In 1958, the Galana Game Management Area was created near Tsavo East park to enable the local Waliangulu people to benefit from the sale through official channels of wildlife products (Parker, 1964; Dasmann, 1964). [*This scheme failed – refer Ian Parker, "What I tell you three time is true. Conservation, Ivory, History & Politics. Librario. 2004. ISBN 1-90440-38-X*]

In Maasailand, in the late 1950s a proposal was made that local people would be involved in management of wildlife areas (National Reserves) in Amboseli and Maasai Mara. Management was delegated to the local county councils which were to collect and distribute revenues (Talbot and Olindo, 1990). Both schemes can be judged failures in terms of provision of benefits to local people (apart from those involved in management).

The management of Amboseli failed to deliver promised benefits and was relieved of control in 1974 (Lindsay, 1987; Western, 1982). In Maasai Mara, the most profitable park in Kenya, Narok County Council, is still in control. It receives most of its income from the reserve and is one of the most financially stable councils in Kenya (ole Parkipuny, 1991), but people around the park have benefited little (pers obs)⁷.

In both areas, local people lost faith in the notion of benefits from wildlife conservation, and were less willing to make compromises for wildlife. Agriculture increased around both parks and poaching resumed (Lindsay, 1987). Other problems around Maasai Mara are uncontrolled grass-fires (Nayioma, pers comm)

and unsustainable wood fuel collection (Kipeno, pers comm; see Appendix Two also).

These examples illustrate the need to involve local people in planning and management of community conservation, and to ensure that promised benefits materialise and are distributed fairly in order to secure local commitment to conservation (see Figure 2, from Lewis, Mwenya and Kaweche, 1990). They also suggest how difficult it can be to achieve these aims.

FOOTNOTES

¹ The generic term "parks" is used to cover National Parks, Managed Nature Reserves and Wildlife Sanctuaries, Biosphere Reserves and World Heritage Sites, as defined by the International Union for the Conservation of Nature and Natural Resources IUCN.

² Source: International Union for the Conservation of Nature and Natural Resources (IUCN). The figures do not include privately-owned sites (of which there are many in South Africa and Zimbabwe), sites under 1,000 ha or those permitting consumptive use of wildlife (eg game ranches, game management areas etc).

³ Source: United Nations Population Division

⁴Source: Overseas Development Administration

⁵ Elephants killed the following numbers of people in Laikipia District: five in 1990; nine in 1991; nineteen in 1992; seven in the year to 1/7/93. Source: Laikipia Elephant Project, KWS. In Taita Hills, elephants killed three people in the period March-May 1991. Source: (Ngure, pers comm).

⁶ In three of the areas visited during this study, human fatalities caused by wildlife had been reported in the month preceding the visit.

⁷ A group of local people recently contested the legality of Narok County Council's acquisition of revenues from tourism on local community land. The people won the case and this may encourage similar actions from other

sections of the community. Source: Daily Nation, Saturday, August 6th, 1993.

⁸KWS, formed in 1989, is a para-statal body with executive responsibility for all Kenya's wildlife, whether on State, private or trust land. The country has a total of 57 National Parks, Reserves and Sanctuaries. KWS runs the National Parks but National Reserves and Sanctuaries may be administered wholly or partly by the local councils who own the land involved.

⁹Source: 1993 Economic Survey

¹⁰ Source: KWS News No. 6, May 1993

¹¹ Most hunting operations also would include cropping activity because hunting offtakes are insufficient to contain wildlife population growth. Hunting offtakes are less than 5% annually for plains game, compared with which impala populations may increase at 30% per year in favourable conditions (Sommerlatte, pers comm).

¹² A recent "elephant drive" in Narok cost one million Kenya shillings (about £ 10,000 Sterling), kept several KWS HQ personnel away from their desks for two days, and led to the cancellation of various meetings and workshops. It was a good public relations exercise but perhaps a waste of limited funds and professional time.

¹³It is more difficult to prevent disruption of social structure through hunting. "Lone" trophy males may in fact be prime breeding animals which have temporarily left the breeding herd to rest (Bothma, 198). There are few guidelines on how to avoid such problems.

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APPENDIX ONE

Main features of areas visited during the study

Narok District

A Maasai pastoralist area, containing Maasai Mara, the most profitable park in Kenya. Part of the greater Serengeti ecosystem, which is one of the last large-scale migration systems on earth. Large populations of migratory wildlife utilise Maasai Mara and the surrounding rangelands, which support the highest concentrations of wildlife in Kenya.

Kajiado District

A semi-arid Maasai pastoralist area. Kajiado encompasses a vital dispersal area for wildlife migrating from areas of high concentration in Amboseli and Nairobi parks. Animals from the Tsavo parks also disperse through the area. Like Narok, Kajiado provides "ecological connections" to Tanzania. Maintaining the wildlife carrying capacity of the Kajiado landscape is important to the future of its parks, which are among the biggest KWS revenue-earners. The ecological security of these parks is linked to the economic security of KWS.

Taita Taveta District

This area is dominated by agriculture. It includes an area between Tsavo East and West which experiences very high levels of human-wildlife conflict, due to elephant crop raiding in smallholdings and sisal plantations around the intensively-cultivated Taita Hills area.

Machakos District

Land uses here include a mixture of commercial livestock ranching and some game ranching on the plains to the south of Nairobi and smallholder farming elsewhere. The land is semi-arid. Some ranchers have use-rights and are actively managing wildlife. The area links Nairobi park with Kajiado District, and is therefore important for wildlife dispersal.

Laikipia District

To the north of Nairobi, where land use consists mainly of commercial ranching on large properties. Some of the ranchers have use rights. Important area for wildlife migrating from northern areas such as Samburu District to the lands around Mount Kenya and the Aberdares park. Migrations increasingly are obstructed by settlement and agriculture on subdivided land.

Samburu District

A sparsely-populated pastoralist area. There are large and varied wildlife populations and a number of parks. Samburu is more remote and economically less-developed than the other regions, but still is a popular destination for tourists visiting its parks or travelling to Lake Turkana in the north.

Note

Machakos, Kajiado and Taita Taveta Districts together form a large landscape unit adjacent to the huge Tsavo parks. In this unit wildlife management could be coordinated at an ecosystem level, thus nullifying one of the major limitations of the parks.

APPENDIX TWO

Management needs in some parks and reserves in Kenya

Examples are given below of some of the management concerns in parks mentioned in this thesis (KWS, 1992a). The examples are intended to illustrate some of the management which is required to compensate for the ecological and social limitations of the parks.

Aberdares (970 km²)

1. Population dynamics of certain species.
2. Illegal incursions into the park - tree cutting and poaching.
3. Leaching of minerals affecting animal distribution i.e. animals leave the park to visit salt licks (Kaaria, pers comm).

Amboseli (392 km²)

1. Impact of tourism.
2. Cattle encroachment.
3. Protection of wildlife dispersal areas.
4. Lack of predators e.g. there are no lions in the park.
5. Elephant compression.

Maasai Mara (1,672km²)

1. No clear management policy.
2. No fire management policy.
3. Tourist impact.
4. Poaching.
5. Pollution and waste disposal from lodges.
6. Illegal livestock grazing in park.

Lake Nakuru (188km²)

1. Lake threatened by siltation from soil erosion in catchment.
2. Pollution from industrial discharges.

3. Possible nutrient deficiencies in various species.
4. Periodic die-offs of waterbuck.
5. Overpopulation of warthog and giraffe.
6. Impact of perimeter fence on animals and plants.

Nairobi (117 km²)

1. Human encroachment and loss of wildlife dispersal areas.
2. Decline in species diversity of plains game.
3. Industrial pollution.
4. Impact of tourism.

Shimba Hills (192 km²)

1. Elephant compression.
2. Human-wildlife conflicts - need for more fencing.
3. Sable antelope population declining, movement out of park.

Tsavo East (11,747km²)

1. Effects not understood of elephants on vegetation.
2. Human-wildlife conflicts.
3. Cattle encroachment and poaching.

Tsavo West (9,065km²)

1. Cattle encroachment and illegal grazing.
2. Elephant damage to local crops and property.
3. Human encroachment.
4. Waste disposal.