



*LUCID's Land Use Change Analysis as an Approach for Investigating Biodiversity Loss and Land Degradation Project*

**Interactions between People and Wildlife  
in Southeast Kajiado District, Kenya**

LUCID Working Paper Series Number: 18

By

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September 2003

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# **Interactions between People and Wildlife in Southeast Kajiado District, Kenya**

The Land Use Change, Impacts and Dynamics Project  
Working Paper Number: 18

By

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## **ABSTRACT**

Wildlife populations in Kenya have been declining for the past 25 years. Wildlife managers increasingly recognize that the survival of remaining wildlife populations depends upon the willingness and ability of people living in and adjacent to areas inhabited by wildlife to support their presence. Since the early 1970s Kenya has implemented policies to increase economic incentives for communities to tolerate adjacent wildlife populations, but their success has been limited as human livelihood systems have continued to experience losses due to predation and crop damage by wildlife. This longitudinal study of competition and conflict between people and wildlife compares the results of questionnaire surveys of farmers and herders followed by feedback workshops conducted in 1977 and 1996 in an area between Amboseli and Tsavo National Parks in Kenya. It shows that reports of conflict have increased since 1977 such that in 1996, despite intensive efforts at community involvement in wildlife management, seventy-five percent of herders and ninety percent of farmers reported problems with wildlife in the previous five years. These included loss of access to resources inside national parks, predation, crop damage, and personal injury. The high degree of friction between people and wildlife reflects ongoing competition over access to scarce land and water resources between herding, farming and wildlife, that has been conspicuous for over 30 years and is intensifying. To be better accepted, wildlife management policy will need to address both the sustainability of peoples' livelihood systems and that of wildlife populations.

### **A. INTRODUCTION**

Wildlife managers increasingly recognize that the survival of remaining wildlife populations in Africa depends upon the willingness and ability of people living in and adjacent to areas inhabited by wildlife to support their presence. Considerable efforts have been made to identify the characteristics and causes of wildlife-society conflict, and to develop strategies for reducing it. Governments and NGOs in countries including Kenya, Zimbabwe, and South Africa have experimented with a variety of approaches to reduce tension between wildlife activities and adjacent communities (Anderson & Grove 1987; Lewis & Carter 1993; Adams & Hulme 2001; Archabald & Naughton-Treves, 2001; Western 2003).

One area that has seen intense efforts since the early 1970s to address issues of community-wildlife interaction is that in southeastern Kajiado District, Kenya between Amboseli and Tsavo National Parks (Figure 1). Here, wildlife resides in protected areas, but more than half the wildlife subsists in lands outside protected areas in pastoral and agro-pastoral lands. In these areas, efforts have focused on ways for people to not only tolerate but also manage and profit from wildlife, particularly with regard to interactions between wildlife and livestock production systems (Lindsay 1987; BurnSilver et al. 2003). These include assessment of ways of returning income from wildlife-based tourism to communities (Western & Thresher 1973;), community participation in developing local policy towards wildlife management (Western 1976, 1982, 1994; Lusigi 1981; Berger 1991; Emerton 1999; Thompson & Homewood 2002).

This paper examines the characteristics of competition and conflict arising from interactions between people and wildlife in the pastoral and agro-pastoral lands lying between Amboseli and Tsavo National Parks. It is among relatively few studies that have examined such interactions over time (O'Connell-Rodwell et al. 2000; Infield & Namara 2001). It compares findings of a survey of people-wildlife interaction conducted in 1977 with those of a comparable survey in 1996. Specifically, the objectives of the study were to:

- Describe changes over time in the interactions between people of different cultural groups and different species of wildlife

- Analyze the root causes of these changes in a framework that recognizes interactions between societal and biophysical processes through time, across space and among scales. This approach leads us to ask questions that may be relevant to future discussions of policy designed to benefit both wildlife and people in the Amboseli system.

## **B. BACKGROUND ON WILDLIFE AND TOURISM IN SOUTHEAST KENYA**

Here we briefly describe wildlife and tourism in Kenya, to form a backdrop and motivation for our study. Southern Kenya and northern Tanzania support the greatest concentration of large mammal species across Africa (Reid et al. 1998) and possibly on earth (Sinclair 1995). Of great concern to wildlife conservationists and to those involved in tourism is a decline in wildlife populations in Kenya. This loss has not been evenly spread across the country; most has occurred in areas immediately adjacent to the highlands and in the driest areas of northern Kenya. They have decreased by 2.5% per year in 16 of the 18 rangeland districts in Kenya between 1978 and 1994, with no change in Kajiado and an increase in Laikipia. (Said et al. 2003). Losses in Narok and Kajiado Districts of southern Kenya have been less significant, although the Mara ecosystem of Narok suffered an average 70% loss of resident wildlife between 1976 and 1996 (Ottichilo et al. 2000; Serneels & Lambin 2001). The Amboseli system, where this study was based, has not experienced a dramatic loss in numbers but has seen significant changes in the spatial distribution of wildlife (Western 1994).

Kenya's wildlife is of global, national, and local importance. Global interest in maintaining Kenya's wildlife resources is illustrated by the Convention on Biodiversity and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Nationally, tourism is second only to agriculture as a source of foreign exchange, earning approximately \$300 million in 2001 (Agence France-Presse 2003). The revenues from wildlife-based tourism accrue at the national level, and much of the discussion regarding community-based wildlife management has focused on returning a sufficient portion to communities that bear the direct costs from disease, predation, crop damage, and personal safety (Norton-Griffiths & Southey, 1995; Norton-Griffiths, 1996). For example, in the Mara Reserve of Narok and Transmara Districts, about 20% of the revenues from the reserve are returned to the local county councils and communities (Thompson 2002).

Until recently most wildlife conservation effort and economic activity were concentrated inside parks. Adjacent communities were little involved despite bearing the heavy cost of wildlife depredation, on crops and livestock. Today, the demands on land around these tourism and wildlife enclaves, the recent precipitous loss in Kenya's wildlife populations outside reserves, and the call for socio-economic development by adjacent communities, have forced a re-examination of policies and legislation. Local people are seeking a more active role in wildlife management and a direct share in the proceeds from tourism. Conservation authorities are realizing that the viability of wildlife within protected areas is dependent on the health of the wildlife populations in the adjacent, much more extensive, rangelands.

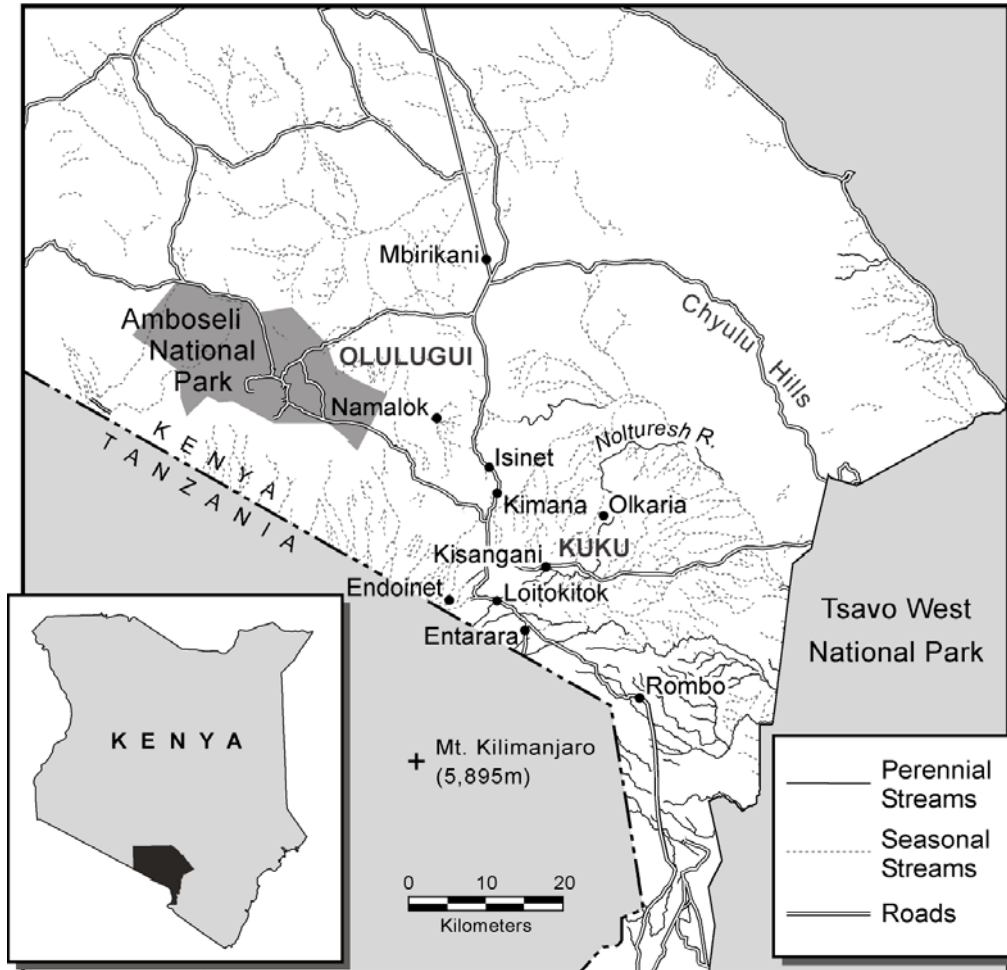
In this context, continued competition and conflict is a challenge to all stakeholders in the wildlife sector. Thus, understanding the patterns and dynamics of interactions between people and wildlife is important to the formulation of policy for wildlife management, tourism, and the development of local livelihood systems.

## **C. THE STUDY AREA**

The study area lies between two of Kenya's most important national parks, Amboseli and Tsavo West (Figure 1). In 2000 they accounted for about 14 % of visits to Kenyan parks and reserves outside Nairobi, down from 20% in 1997 (Kenya National Commission for UNESCO 2001). Wildlife and our hominid ancestors have been part of nearby landscapes

like this for millions of years (Leakey & Hay 1979). In the last few millennia, some people in East Africa adopted pastoralism (Pilgram et al. 1990), and this was the principal land-use practice in the lowlands of this ecosystem in the late 1800's (Thompson 1962).

**Figure 1.** Map of Southeast Kajiado District



The more recent historical context for this contemporary pattern of competition has been discussed by a number of authors (Campbell 1981, 1993; Campbell & Olson 1991; Rutten 1992; Galaty 1994; Western 1994; Krugmann 1996; Southgate & Hulme 2000). Over the past 75 years, the original pastoral land managers, the Maasai herders, have relinquished to wildlife and farming their control over resources fundamental to their herding economy. Farming on the slopes of Mt. Kilimanjaro began in the 1930's and immigration of farmers from other areas of Kenya, particularly since independence, has resulted in cultivation of large tracts suitable for rain fed agriculture and for irrigation (Campbell et al. 2000). After World War II, some of the rangeland was set aside for conservation purposes in what is now Amboseli and Tsavo National Parks.

Since the mid-1970s two major land use changes have occurred in our study area. First, cultivation has expanded at the expense of forest on Mt. Kilimanjaro, and riparian vegetation along rivers and around swamps in the lowlands. This is associated both with an increase in the number of people from farming groups, a consequence of natural increase in the population and of immigration from overcrowded areas elsewhere in Kenya (Table 1), and also with herders who have diversified into cultivation (Campbell et al 2000). Second, as part of its wildlife management strategy the Government of Kenya is encouraging the



establishment of tourist facilities on group ranches adjacent to the parks. For example, in 1996 the Kimana Group Ranch established an independent Wildlife Sanctuary (Kellert et al. 2000). Today these land uses compete for access to resources, particularly grazing and water, and many more people are now located where their economic activities, and personal security, are vulnerable to threats from wildlife.

**Table 1.** The total human population of Kajiado District, 1969-1999.

CENSUS YEAR	KAJIADO DISTRICT			KENYA
	POPULATION	INTER-CENSUS GROWTH (%)	AVG. ANNUAL GROWTH (%)	AVG. ANNUAL GROWTH (%)
1969	85,093*			
1979	149,005*	75.1	5.76	3.8
1989	258,659*	73.6	5.67	3.4
1999	405,000**	56.6	4.58	2.9

\* Kenya, Central Bureau of Statistics, Population Census 1969,1979,1989

\*\*Ministry of Finance and Planning, February 2000. Provisional Results of the 1999 Population and Housing Census.

The implications of these ongoing changes for the survival of wildlife are serious. While the Maasai, through grazing and burning, have been altering the landscape for hundreds or perhaps thousands of years, the degree to which the habitat occupied by wildlife is controlled by human activity has increased as parks have been created, and as agricultural land use in this ecosystem has expanded in area from approximately 7,500 hectares in 1973 to approximately 30,000 hectares in 2000 (Campbell et al. 2003). This has restricted the access of wildlife to water along streams and around swamps in the dispersal and migration areas that lie between Tsavo and Amboseli National Parks (Worden unpub data). In consequence there is competition and conflict in the area over water and land resources critical to each of the three principal land uses, farming, herding and wildlife. This amplifies the tensions between people and wildlife.

#### **D. METHODS**

This study examines peoples' concerns about wildlife conflict over a 20-year period during which a variety of initiatives to address community-wildlife conflict were undertaken. Issues of competition and conflict over resources among and between the three dominant land uses - herding, farming and wildlife-based tourism - were investigated in 1977 and 1996 employing similar research methods. Information was derived from a variety of sources including archives, scientific and policy documents, household surveys, community workshops, and discussions with key informants.

The study used stratified random sampling of households along four ecological transects that descended from the Tanzania border in the south into the semi-arid rangelands to the north - from Endonet to Namelok, Loitokitok through Kimana and Isinet to Mbirikani, from Entarara to Kuku, and in Rombo (Figure 1). The sampling along transects was stratified by major land use to include rain fed agriculture, irrigated lands, and pastoral areas. Household surveys were conducted in 1977 and 1996 using the same sampling methodology and similar questionnaire. In 1977, 167 herders and 225 farmers were interviewed, while in 1996 we interviewed 227 herders and 332 farmers (Campbell 1999). In both 1977 and 1996 the results of the surveys were discussed at community workshops (Campbell 1987; 1999) and

with key informants. This provided opportunities to assess interpretations directly with the people of the study area. Their insights were invaluable and clarified a number of issues that might otherwise have been misinterpreted or underestimated.

#### **E. RESULTS: INTERACTIONS AMONG WILDLIFE/TOURISM, HERDING AND FARMING 1977-1996**

The interaction between wildlife and other land users is analyzed in the context of changing demographic, cultural, economic, policy and institutional conditions. The results of the 1977 and 1996 surveys demonstrate that conflict between wildlife, farming, and herding has changed in its nature and distribution as human livelihood systems have developed in response to a variety of local and external processes (Campbell et al. 2000). The majority of respondents in 1996 reported the situation becoming more serious. Relatively few were optimistic that the situation would improve over the next five years.

In 1977 conflicts with wildlife reported by herders concerned interaction with livestock - predation, access to grazing and water (Table 2). They said that they reduced these problems by moving away from the wildlife, and if need be by hunting. In 1977, our survey showed that very few Maasai were farming. By 1996, one-third of the households who described themselves as herders were also farming and thus were farmer-herders. In Table 2 we include all households who described themselves as herders in either year despite this change in their agricultural practices. The proportion of respondents reporting conflict with wildlife increased from 32% in 1977 to 75% in 1996. For those who were predominantly herders in 1996, the conflict issues with wildlife were the same as for herders in 1977. In 1996 there were also new conflict issues reported by the farmer-herders that were not mentioned in 1977, including eating and trampling of crops and bothering people, which were also frequently reported.

**Table 2.** Issues over which herder-wildlife conflict was reported 1977 and 1996, by percent of those reporting conflict. All respondents were Maasai.

	1977	1996
ISSUE	Number reporting conflict = 53 (32% of sample)	Number reporting conflict = 97 (75% of sample)
Predation	72	53
Access to grazing	43	14
Access to water	17	3
Eat crops	0	72
Bother people	0	58
Trample crops	0	49
Spread of disease	0	9

df=6.  $\chi^2$  of 129 is significant at the .001 level comparing across years

The proportion of farmers reporting conflict with wildlife increased between 1977 and 1996 (Table 3). In both periods eating and trampling of crops were the most frequently reported problems. The principal difference between the two surveys is that the latter included farmers who began farming in the lowlands between the two surveys. These lowlands systems included sheep and goats alongside crop cultivation. Thus one of the principal differences between the two time periods is addition of conflicts related to livestock in 1996. Interestingly, the Maasai, once they became farmers, faced the same conflicts as non-Maasai farmers. Much of the increase in conflict with wildlife in the lowlands can be attributed to the fact that cultivation extended to riparian areas where wildlife congregated.

**Table 3.** Issues over which farmer-wildlife conflict were reported by Maasai and non-Maasai farmers in 1977 and 1996, by percent of those reporting conflict.

ISSUE	TOTAL		MAASAI		NON-MAASAI	
	1977	1996	1977	1996	1977	1996
	No. reporting conflict = 137 (61% of sample)	Number reporting conflict = 223 (75 % of sample)	Number reportin g conflict = 53 (60% of sample)	Number reportin g conflict = 112 (80% of sample)	Number reportin g conflict = 84 (62% of sample)	Number reportin g conflict = 100 (70% of sample)
Eat Crops	97	94	92	96	100	94
Trample Crops	50	74	45	69	52	82
Bother People	20	59	17	54	23	64
Predation	5	35	7	45	0	26
Spread Of Disease	6	31	13	36	1	28
Access To Grazing	0	13	0	20	0	6
Access To Water	0	13	0	12	0	15

Total 1977-96 df = 6.  $X^2$  of 82 is significant at the .001 level

Maasai 1977-96 df = 6.  $X^2$  of 31 is significant at the .001 level

Non-Maasai 1977-96 df = 6.  $X^2$  of 56 is significant at the .001 level

**Table 4.** Wildlife species involved in herder-wildlife conflict 1977 and 1996 by percent of those reporting conflict.

SPECIES	1977	1996
	n = 53 (32% of sample)	n = 97 (75% of sample)
Buffalo	70	37
Lion	62	36
Elephant	43	62
Antelope*	28	62
Leopard	26	35
Wildebeest	9	19
Zebra	9	24
Hyena	0	60
Monkey	0	38
Baboon	0	33
Porcupine	0	4
Wild dog	0	3
Giraffe	0	3

\*antelope include smaller antelope such as Grants and Thompson's gazelles, and impala.  
df = 12.  $X^2$  of 96 is significant at the .001 level

The frequency with which different wildlife species were reported to be in conflict with herders changed from 1977 to 1996 (Table 4). Fewer species conflicted with herders in 1977 compared with 1996. In 1977 the major issues reported were livestock predation by lion and leopard, and competition over access to grazing and water with buffalo, elephant, antelope and other ungulates. In 1996 herders also reported wildlife damaging crops as well as interfering with livestock. This was particularly the case around swamps where there was a

high incidence of conflict with hyena, antelope, buffalo, leopard, elephant and monkey. At the feedback workshops local people confirmed an increased concern with hyena, explaining that there were more of them and that they had changed their behavior, more frequently approaching settlements and attacking livestock, both around the swamps and in the open rangeland.

Conflicts reported by farmers (Table 5) also differed from species to species. Farmers reported conflicts with more species in 1996 than previously. The frequency of complaints about antelope was very high and was similar for both 1977 and 1996. In 1977 the most frequently mentioned wildlife was buffalo, but by 1996 these complaints were fewer and concentrated mainly at the swamps. Predatory activity by lion was similar at both times. Reported conflicts with each species were similar between Maasai and non-Maasai farmers except for the higher incidence of conflict with hyena reported by Maasai than by non-Maasai. Farmers reported increases in conflicts in 1996 with monkey and elephant. There were also more frequent reports of damage by zebra, leopard, baboon, porcupine, wild dog and particularly hyena. The giraffe appeared to be less of a problem for farmers but the 1977 results may have overestimated the role of giraffe, because at the time of the survey in 1977 a herd was concentrated around the Loitokitok airstrip, generating complaints from nearby farmers.

**Table5.** Wildlife species involved in farmer-wildlife conflict 1977 and 1996,by percent of those reporting conflict.

WILDLIFE SPECIES	TOTAL		MAASAI		NON-MAASAI	
	1977	1996	1977	1996	1977	1996
	n = 137 (61%)	n = 223 (75%)	n = 53 (60%)	n = 112 (80%)	n = 84 (62%)	n = 100 (70%)
Buffalo	84	25	83	25	85	24
Antelope	74	77	64	79	80	74
Elephant	57	66	58	64	56	67
Monkey	32	39	23	42	38	38
Wildebeest	20	17	23	18	18	16
Giraffe	19	11	24	14	15	6
Lion	10	8	25	11	0	5
Hyena	6	27	15	42	0	14
Leopard	6	14	13	19	1	10
Zebra	4	33	6	37	2	31
Porcupine	1	27	1	30	1	24
Baboon	0	23	0	24	0	22
Wild Dog	0	13	0	14	0	10

Total 1977-96 df = 12.  $X^2$  of 210 is significant at the .001 level

Maasai 1977-96 df = 12.  $X^2$  of 98 is significant at the .001 level

Non-Maasai 1977-96 df = 12.  $X^2$  of 126 is significant at the .001 level

In 1996, the interactions with wildlife differed from area to area (Table 6). The greatest number of conflicts with any species of wildlife was found in the swamps. In the croplands on the mountain slopes, most complaints concerned smaller species of wildlife and scavengers, particularly antelope, porcupine and hyena. On lower slopes, antelope and elephant were the most frequently reported. In riparian locations and the swamp margins, blame for crop damage is placed on elephants, buffalo and antelope, together with porcupine, baboon and monkeys in Kimana and Kuku. Those respondents who keep livestock, herder-farmers and herders, were concerned with predators - lion, hyena and leopard.

**Table 6.** Wildlife species involved in conflict 1996 at different sites by number and percent of respondents reporting conflict.

	TOTAL		RANGELAND		SWAMP		LOWER MOUNTAIN		UPPER MOUNTAIN	
	n=392	%	n =136	%	n=118	%	n =104	%	n =34	%
Number of Respondents: herders &/or farmers										
Antelope	291	74	68	50	113	96	81	78	29	85
Elephant	261	67	62	46	117	99	70	67	12	35
Hyena	223	57	103	76	80	68	22	21	18	53
Monkey	176	45	44	32	79	67	39	38	14	41
Zebra	151	39	61	45	39	33	41	39	10	29
Buffalo	147	38	36	26	82	69	22	21	7	21
Porcupine	119	30	14	10	52	44	28	27	25	74
Lion	108	28	52	38	50	42	5	5	1	3
Leopard	105	27	24	18	59	50	14	13	8	24
Baboon	94	24	20	15	39	33	24	23	11	32
Wildebeest	70	18	12	9	38	32	16	15	4	12
Wild Dog	56	14	10	7	29	24	13	13	4	12
Giraffe	36	9	3	2	12	10	13	13	8	24

The actions taken by herders to reduce damage by wildlife changed between the two surveys, reflecting the fact that many herders are now also farmers (Table 7). In 1977 herders' responses were limited to hunting and reporting to game wardens, and many did nothing. In the 1996 survey herders reported scaring the animal and building fences much more frequently, and more contacted the game warden. Fewer herders report killing the animals involved. Herders were less likely to build fences in response to conflict than farmers in either year. There was a substantial decline in reporting to the game warden among farmers between 1977 and 1996 (Table 8). About the same proportion of farmers, around 60%, build fences and in 1996 more of them reported scaring or killing the animals.

**Table 7.** Action taken over herder-wildlife conflict 1977 and 1996 by percent of those reporting conflict.

	1977	1996
Report to game warden	43	52
Hunt the animal	34	15
Scare the animal	1	69
Build fences	0	28
Leave the area	0	1

df = 4.  $\chi^2$  of 53 is significant at the .001 level

**Table 8.** Action taken over farmer-wildlife conflict 1977 and 1996 by percent of those reporting conflict.

	TOTAL		MAASAI		NON-MAASAI	
	1977	1996	1977	1996	1977	196
<b>ISSUE</b>	n = 137 (61%)	n = 223 (75%)	n = 53 (60%)	n = 112 (80%)	n = 84 (62%)	n = 100 (70%)
Report to game warden	93	29	90	24	96	29
Scare the animal	49	83	53	81	48	89
Build fences	56	57	61	60	53	57
Hunt the animal	0	13	0	16	0	10
Leave the area	0	6	0	4	0	8

Total 1977-96 df = 4.  $X^2$  of 103 is significant at the .001 level

Maasai 1977-96 df = 4.  $X^2$  of 47 is significant at the .001 level

Non-Maasai 1977-96 df = 4.  $X^2$  of 60 is significant at the .001 level

## F. DISCUSSION

This is one of the few studies that has been able to represent changing patterns of human-wildlife competition and conflict over an extended period of time, during which the livelihood systems of the people in the area changed dramatically in nature and extent. Explanation of the differences over 20 years lies in the complex processes of socio-economic change and their interplay with the area's environment. The driving forces are found locally, and in national and international processes. They are institutional and ecological, cultural, economic and political. They reflect the goals of individuals, institutions and governments; goals that may converge or be in opposition. The outcomes are determined by the exercise of power through fiat or negotiation.

Significant changes have occurred in the past 20 years in all aspects of the area's economy. The traditional livestock-based land use was less common by 1996 as many herders farmed. Agriculture had expanded and become more differentiated, to include both rain fed agriculture on the slopes of Mt. Kilimanjaro and irrigated agriculture, mostly horticulture, adjacent to swamps and perennial streams (Campbell et al. 2003). Tourism-related activities had developed outside the parks (e.g., Kimana Wildlife Sanctuary and a variety of tented camps). Economic liberalization, structural adjustment and improvements in air transport that have expanded European markets have influenced the development of farming and tourism.

The pattern of interactions between people and wildlife changed and became more intense. Some of the changes in conflict reflect changes in the populations of wildlife, particularly the increase in hyena populations (and conflicts) and the decrease in lion populations (and conflicts). However, many of the differences between time periods reflect changes in livelihood systems and in their interactions with wildlife. The development of horticulture around swamps and along rivers has increased conflicts around a resource that is critical for all human and non-human species in this dry ecosystem. Horticulture has raised the value of agricultural commodities being produced and thus increased the direct costs of wildlife damage to crops. Contemporaneously, others have expanded tourist-related activities outside the parks and they are concerned to maintain wildlife populations. This puts wildlife management at the center of debates over the appropriate development strategy for the region and discussion of who bears the costs and who receives the benefits from wildlife.

In the 1970s, discussion of how to compensate landowners in wildlife dispersal areas for the impact of wildlife surmised that wildlife-derived income could be far greater than any income

from the existing activities in the marginal semi-arid rangelands. New forms of income generation both confirm and challenge this view. The potential revenues from tourist accommodations and designated wildlife viewing areas outside the parks and reserves are great, though they can fluctuate within a relatively short time period as a consequence of the impact of economic conditions or political events on tourism. At the same time the potential income from horticulture is also considerable.

Government policy reflects a convergence between international and national interests in conservation (biodiversity) and economic growth (foreign exchange). It assists tourism and manages wildlife resources to maintain biodiversity. Important to these objectives is the promotion of supportive local and national institutions. In 1977 considerable tension existed between local communities and governmental institutions concerned with wildlife. The losses of livestock and crops to wildlife were largely uncompensated and game wardens were seen as unresponsive. These mounting pressures resulted in a policy change that recognized the costs wildlife was imposing on local communities. This was articulated in Wildlife Policy of 1977 (Kenya 1977) that stipulated that wildlife would have to “pay its way” in the rural landscape in order to survive.

Concern over negative attitudes of local people towards wildlife led the government to make significant efforts to improve the situation through greater community involvement in wildlife management. This has included efforts both by the government, and by NGOs. Community-based wildlife management (CBWM) has been practiced over the past 20 years with a focus upon the Maasai. Western (1982, 1994) discusses this and the roles of individuals and institutions in promoting conservation. Researchers have questioned whether or not the involvement of individuals and institutions represents a form of participation that has empowered the Maasai in their management of resources (Campbell 1987; Little 1996). Lindsay (1987) has argued that this is a significant factor in the limited success in the adoption of community-based conservation in the Amboseli area, a view that Western (1994:39) disagrees with, arguing that national level policy, institutional failures and corruption were most important. However, referring to the Kenya Wildlife Service (KWS) and the Wildlife and Conservation Management Department (WCMD), he states “KWS and the Maasai increasingly will have to meet on equal terms, not on the paternalistic basis that dominated WCMD’s attitude and KWS’s formative approaches.” (Western 1994:49).

An additional issue is that the focus upon the Maasai has meant that the non-Maasai population has not been as actively engaged in CBWM. Western (1994) recognizes that the early planning for the Amboseli area was predicated on a view of Maasai society as relatively homogenous in terms of economic and cultural characteristics. The present circumstances are different however, as the area has “a far more heterogeneous community - farmers, ranch members, wildlife entrepreneurs, traders, transporters, teachers etc. - and one less easily represented by a few voices.” (Western 1994:49). Thus planning ought to consider the interests of other land users, as well as those of the Maasai (Little 1996).

The distinction between land owners, predominantly the Maasai, and land users, who include different ethnic groups and a wider range of livelihoods, is important. Even as recently as February 2003, however, the authors were present at discussions where this distinction was not readily accepted, and representatives of wildlife-related NGOs continued to focus upon the Maasai as the dominant entity in determining wildlife-community interactions. The lack of appreciation in wildlife management policy of the diversity of livelihood systems and related changes in institutional arrangements raise questions about the goals of wildlife management for the people of the area, for the future of their land and land use systems. Who gains and who loses? What are the implications for future land management? Will land use come to reflect a myriad of uncoordinated decisions for individual plots? Will fencing

become a feature of the landscape? What are the ramifications for herding and for wildlife dispersal?

The most important process affecting land use is subdivision of the group ranches, communally owned areas, into land units owned by individuals (Galaty 1994; Ntiati 2002). Land use change continues under population growth and sub-division and has implications for wildlife-based activities. Individual land ownership may result in even more fencing of land causing fragmentation of the rangeland landscape with impacts on the movement and viability of wildlife populations. Fencing usually occurs first around the most valuable resources in the landscape, and this is true in Amboseli with fencing already in place around Namelok swamp. If more swamps are fenced, the viability of pastoralism and wildlife in the ecosystem may be put in question.

In addition, the institutional arrangements for land management among the Maasai are changing and are uncertain under individual land ownership. What community structures will replace the group ranch committees? What institutions will represent the interests of farmers, traders and others with economic interests in the area? Will greater authority rest with the chiefs? What arrangement will be most/least facilitative of wildlife interests - conservation, biodiversity, and the wildlife-based economy? (Campbell 1993).

A chronic issue for local people that influences attitudes to wildlife conservation and management is the lack of compensation for wildlife damage. For years it has been classified by KWS and by local people simply as “wildlife damage”, without reference to specific species. People’s perception of the “wildlife problem” is inclusive of all wild animals, not only those of touristic value. For example, they do not differentiate between damage caused by porcupine, the second most frequently mentioned animal on the rain fed slopes of Mt. Kilimanjaro, and that caused by elephants. Both cause financial loss, and people look to KWS for compensation.

Government policy on compensation developed at a time when most costs were caused by economically significant wildlife. Compensation for predation or crop damage was seen as a *quid pro quo* for the protection of wildlife. Since that time the pattern of land use has changed. People have intensified production on the mountain slopes and expanded crops into new areas. This has altered land cover, the habitat for wildlife, and the wildlife species causing the costs, particularly to crop production.

Under these altered conditions, should the definition of what constitutes wildlife damage worthy of compensation be re-examined? Should some wildlife species, such as porcupine, be classed as vermin, and thus not be the object of compensation as is the case with birds such as quelea? Should wildlife damage in areas where agricultural land use has recently expanded, such as along streams and around swamps, be seen as a shared responsibility of wildlife managers and farmers? In these cases perhaps only damage by wildlife of immense value, such as elephants should be compensated.



## **G. POLICY IMPLICATIONS**

The issue of compensation illustrates clearly the importance of finding effective means to address societal concerns so that people living in and adjacent to areas inhabited by wildlife can support the presence of wildlife. That the levels of conflict have remained high over the twenty years examined by this study suggests that the variety of initiatives to engage communities in wildlife management have had limited success. The causes lie locally as livelihood systems have changed and demand has increased for critical resources shared with wildlife, and externally as global interests in conservation and national economic interests in tourism have emphasized policies designed to protect wildlife. Wildlife management issues such as those discussed above, provide a clear example of the elusive processes whereby what happens locally has a direct bearing upon policy outcomes.

Greater power to design and implement policy lies with global and national institutions than with local ones. Yet it is at the local level that the goals will be realized or not, and that the conflicting claims on resources by local and external interests are mediated. Approaches such as Integrated Development and Conservation Projects, and Community Based Wildlife Management, have attempted to improve local communities' tolerance of wildlife. However there is a growing body of evidence that such approaches have not met their objectives (Alpert 1996; Turner 1999; Songorwa 1999; Twyman 2000; Kellert et al. 2000). Some see participation being used as a means of extending government control of rural communities (Neumann 1997); others emphasize a need to fully involve local people to empower their role in establishing the goals and priorities of community-based development (Wells & Brandon 1992), while still others, recognizing that they have been implemented during a period of rapid cultural, economic and demographic change, call for more comprehensive approaches that reflect the complexity of ecological systems, human systems, and their interactions (Newmark & Hough 2000; Thompson & Homewood 2001). The challenge is to establish goals for economic development and for conservation, set priorities, and develop strategies to achieve them in ways that are broadly acceptable and viable.

Goals of economic growth, at individual, community and national levels, and global concern for biodiversity illustrate the variety of pressures demanding supportive policy initiatives. There is considerable discussion about which management strategies are appropriate (Heinen 1996) and whether anthropocentric approaches can achieve the goals of conservation and also the capacity of science and technology to find solutions to conservation problems when the functioning of the ecosystems and their patterns of interaction with society are poorly understood (Stanley 1995).

Given the diverse interests at play, it is relevant to ask whose goals and priorities are to be promoted? Is social equity an issue? For whom and to what end are the strategies to be acceptable and viable? The existing conflicts between local communities and wildlife represent a clash of interests. Each of the interested parties (local communities and wildlife representatives in the conservation community) has a measure of power with which to enact or negotiate outcomes. Is a goal of conserving biodiversity superior to one of maximizing horticultural production? Are these activities in a zero-sum game or can compromises yield greater combined benefits? Such questions may not be readily answered, or answers may imply politically impractical outcomes. It is important however, to pose them and to make explicit that the control and use of power will ultimately define future outcomes regarding broad land use questions, and human-wildlife conflict specifically.

## **H. CONCLUSION**

This study has examined human-wildlife competition and conflict in the study area in the context of complex long-term interactions between society and environment. It illustrates the difficulty of devising effective strategies to reduce such conflict and promote land use strategies in which both livelihoods and wildlife can be sustained. While similar studies have been conducted elsewhere in Africa, this study is unusual in that it has examined people-wildlife interactions across a 20-year period during which a series of initiatives designed to reduce conflict were implemented. It has shown that these issues remain intense, and that their characteristics have altered as the area's land use and livelihood systems have adapted to opportunities and constraints afforded by national policies and economic development.

The present pattern of land use, of which human-wildlife interaction is one facet, is the outcome of complex processes. It is a legacy of past processes whose contemporary directions signal future patterns. These are combining with very recent trends, such as institutional change, whose short-term effects are being taken advantage of to promote selected interests and policies, but whose long-term implications are poorly understood. The economic costs of human-wildlife conflicts and policies designed to ameliorate them have (Emerton 2001), therefore, to be analyzed in terms of the changes in economic production that are an outcome of an historical process with economic, social/cultural, demographic, political and ecological dimensions. Understanding of these processes and their driving forces, including the exercise of power by institutions and individuals for specific objectives, is important to the formulation of future policy directions for land use planning that includes wildlife alongside human activities.

These findings suggest that policies to address human-wildlife conflict need to be conceived within the context of overall national development policy and its application to the areas where conflict is occurring. They also illustrate the importance of adopting conceptual frameworks such as Landscape Ecology (Naveh 1991; Farina, 1993; Nassauer 1995; Field et al. 2003) and Political Ecology (Blaikie 1994; Blaikie & Brookfield 1987; Rocheleau et al. 1996; Peet & Watts 1996; Zimmerer & Young 1998) for analysis of natural resource management that effectively integrates biophysical and socio-economic processes (Kinzig 2001; Ewel 2001), facilitate discussion of complexity and uncertainty (Faucheux & Froger 1995; Newmark & Hough 2000), and emphasize the importance of adopting relevant spatial and temporal scales of analysis (Levin 1992).

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