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Maasailand Sustainable Development and Wildlife Management Through Pastoralism and Trophy Hunting

By

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# **DECLARATION OF OWN WORK**

I declare that this thesis...

# Maasailand Sustainable Development and Wildlife Management through Pastoralism and Trophy Hunting

... is entirely my own work and that where any material could be construed as the work of others, it is fully cited and referenced, and/or with appropriate acknowledgement given.

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# ABSTRACT

This paper investigates the role of trophy hunting and pastoralism to reduce human wildlife conflicts in Maasailand, Tanzania and provide a sustainable strategy for development and wildlife management.

It presents an analysis of causes of conflicts between the Maasai and wildlife, perceived patterns of livestock losses and trends of crop damage, identifying factors that influence local perceptions of problems to livelihood and attitudes to conservation. Data from an attitudinal survey of 70 Maasai households in 3 Maasai villages in a hunting block are used to examine local perceptions of trends in their livelihood activities, worries and concerns in providing for themselves and their families, conflicts with wildlife, attitudes to conservation and relationships with the hunting company, Robin Hurt Safaris Ltd.

Solutions discussed are a change in the state property regime, reform of wildlife management policies and a community based conservation and development model by use of hunting revenues.

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## 1. INTRODUCTION

The semi-arid plains of East Africa are known for their spectacular wildlife diversity and an abundance of large wild herbivores. For many years nomadic pastoralists have inhabited these areas. Particularly of note are the Maasai who traditionally have co-existed with wildlife.

Conservation philosophy in Africa has in the past focused on the establishment of protected areas to conserve wildlife. In Tanzania, national parks represent only a small portion of Tanzania's wildlife areas (Packer 2004); in turn, only a small number of animals are found in protected areas. The game reserves and national parks are 110,013km<sup>2</sup> and 38, 365 km<sup>2</sup> respectively in size, and some 27% of the country. Yet the area of the game controlled areas is bigger than the total area of the protected areas. Tanzania has over 130 hunting concessions covering an area in excess of 250,000 km<sup>2</sup> that are leased to outfitters licensed to conduct trophy hunting (Baldus and Cauldwell 2004). As the majority of wildlife in Tanzania is found in hunting blocks and game controlled areas, the focus of conservation has evolved to recognise the importance of protecting wildlife outside protected areas. It has moved away from the 'fences and fines' approach (Wells 1992) towards an approach that integrates human development needs with conservation objectives. The conservation of wildlife outside national parks outside the protected areas cannot be achieved by protecting animals and avoiding issues of people's needs and rights and their conflicts with wildlife.

It is routinely observed that pastoral societies in East Africa are changing rapidly and irrevocably. Land loss, population pressure and economic change have resulted in the impoverishment and marginalisation of pastoralists. As a result there are generally fewer livestock per capita than before. Livelihoods are changing and pastoralists can no longer realistically hope for a pastoral future (Brockington 2001). In regions where rainfall is marginal for farming and droughts are common, diversifications of livelihood activities can be used to some extent to reduce risk and overcome instability due to the climate (Ashley, 2000; Ellis, 1998). Villagisation in Tanzania has seen the promotion of community settlements in areas only used seasonally in the past (Kikula, 1997). There has been widespread government support for agricultural rather than pastoralist and hunter-gatherer lifestyles (Armitage, 1996). For these reasons, in this area the Maasai people have made a rapid transition from pastoralism to agriculture in the last thirty years. The change in land use pattern in Burko, the study area, towards agricultural expansion is competing for the land supporting wildlife and is the key driver for the decrease in the numbers of resident wildlife. The conservation of wildlife is threatened by cultivation, as the area frequented by game is being lost and wildlife-human conflicts are intensified.

Knowledge of conflicts between people and wildlife is required for the design of sustainable conservation strategies for the management of wildlife. Many people living in rural Africa incur the costs of living with wildlife without receiving any benefits from the relationship (Sibanda and Omwega, 1996; Naughton- Trevers, 1998). In the Caprivi region of Namibia, rural people have viewed wildlife as a detriment instead of an asset (Brown and Jones 1996). This is a trend that is emerging in Tanzania. As rural communities influence future land use decisions, the prevailing negative attitudes towards wildlife have the potential to undermine conservation efforts unless crop and stock depredation costs are reduced. The solution to reduce conflict is through pastoralist development and community based conservation from trophy hunting revenues.

## 2. BACKGROUND

In view of increasing pressure on land sources resulting from rapidly growing human populations in the third world countries, especially Africa, wildlife conservation programme today aim to managing, sustainably utilising and developing the resource for the long-term benefit of mankind. Unlike in the past, therefore, these programmes aim to include and integrate human activities with conservation (Baldus 1986, Boshe 1989, Schonewald- Cox 1988). Because of this increased human dimension, conservation problems are now becoming increasingly more complex and dynamic.

# Problems of wildlife conservation in Africa

In most African countries today, rates of human populations growth are higher than in most of other countries of the world. This has resulted in tremendous pressure on land resources to produce sufficient food, energy and shelter for such rapidly growing human populations. Consequently, wildlife areas which were once of considerable size and harboured sizable wildlife populations, have recently been reduced to "ecological islands", and exploitation of wildlife for both sustenance and commercial gains has taken on a form and magnitude that are not in balance with the rates of replacement of individual species populations (Boshe 1986a and 1986b). Presently, the long-term existence of these 'ecological islands' and the continued survival of the wildlife in them are becoming increasingly questionable as human pressure continues to mount (Boshe 1989a)

Threatened ecological systems and declining wildlife populations, as has been seen during the most recent years are, in no doubt, the most immediate and challenging conservation and management problems facing the wildlife managers of today throughout Africa and elsewhere. Judging from their nature, therefore, wildlife conservation and management problems worldwide, and indeed, Africa, are more sociological in nature than biological (Boshe 1989b).

The increasing human pressure on land resources, encroachment to wildlife areas

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and unsustainable utilisation of wildlife resources are now threatening the continued survival of some ecological systems and wildlife species. Unfortunately, most of the present (and indeed the past) research efforts in Africa have largely ignored this situation, and continued to concentrate on pure biological research and annual population monitoring programmes (Boshe 1989c), often studying the same insecure ecological systems and the declining wildlife populations



Fig. 1 Table to Show Categories of Research in Tanzania (1978-1988)

#### 2.1 CULLMAN & HURT COMMUNITY WILDLIFE PROJECT

This study was conducted in collaboration with Robin Hurt Safaris and the Cullman & Hurt Community Wildlife Project. The fieldwork was carried out in one of their hunting blocks in northern Tanzania, known a Burko.

The Cullman & Hurt Wildlife Project was founded in 1990 on the conviction that wildlife and it habitat can only be conserved by involving the local people, and from that involvement give them a direct benefit from the wildlife among which they live. It is also recognizes that communities living in wildlife areas are willing to have more responsibility to conserve and manage the wildlife and natural resources in their area. It is a community- private Sector partnership founded by Joseph Cullman, a US businessman and philanthropist, and Robin Hurt Safaris Ltd., a private hunting company, to provide benefits in the form of development projects funded with hunting fees.

Clarke (2001) and Evans (2002) provide a useful history of the project. It aims to create a sense of stewardship and ownership in rural communities for wildlife and other resources in areas where they have traditionally hunted and controlled in spite of unclear land tenure. The goal is to ensure that the 30 villages currently within Robin Hurt Safaris' hunting blocks benefit from tourism hunting that occurs on land that they consider theirs. The project finances local development with hunting fees, and organizes anti-poaching patrols and educational activities. The project is successful because it provides direct benefits for local people, as well as a sense of responsibility and control. Government policy has recently been enacted that requires all commercial hunting companies to conduct community conservation projects and to initiate their own community based antipoaching efforts. The Cullman & Hurt project not only began this well before they were required to, they also established an innovative fee mechanism combining a surcharge on hunting fees and private donations.

The aims of the project are

- To involve local communities in the promotion of wildlife and habitat conservation through the proper sustainable utilisation of renewable resources;
- To promote and encourage village anti-poaching programmes;
- To co-operate and help the Wildlife Department in all its conservation ideals;
- To discourage illegal, unselective and wasteful use of wildlife, such as commercial meat poaching, by such means as cable long line snaring;
- To help local communities understand and manage wildlife in a sustainable manner and to take on responsibility for its long term stewardship;

• To ensure that communities benefit from wildlife in terms of money, employment, food and community projects.

In summary, the idea is to encourage village communities living near wildlife areas to take on the responsibility for the well being of wildlife and its habitat through realising that wildlife is a renewable and lucrative natural resource. Wildlife will provide a better long- term return through its conservation, than by its exploitation (Capper 2001)

The project has developed reliable and sustainable revenues for communities through surcharges on hunting. Financing for the community development projects comes from clients hunting paying a 20% mandatory Community Conservation Fee above the Government Game Fees to support development projects Private donations are also sought to cover additional management fees, as well as the entire anti-poaching program. These donations are often made through a non-profit organization, Game Conservancy USA, which is based in the United States and thus provides tax deductions for Americans (Clarke 2001). The anti-poaching activities have involved local communities and reduced poaching, and public awareness about conservation and its benefits has increased. Project Field Officers train villagers and lead tem in the field with a Government Game Scout.

The communities decide each year how revenues from hunting should be used for their village. The funds donated by hunting clients are held by the Project on behalf of the village as a way to ensure that the funds are used in an accountable way. At the end of the hunting season, the money is totaled and the village and district authorities are advised of the amounts available. A village meeting is organised, a village project is identified through discussions and a project committee is formed, usually comprised of 3 women and 3 men. The Project Director and the committee implement the project together. Villages are encouraged to use the funds for some form of building that will be a permanent asset such as a primary school, dispensaries, and water projects.

Village benefits from 1991-2001 are USD 715,253. The project has successfully

financed a wide variety of community level projects in each of the participating villages, including build school facilities (47), health facilities (16) and water projects (28), as well as providing food and water during several severe droughts and food shortages. From 1991 to 2001 a total of 119 projects were funded in 23 villages.

The amount of funds available for each village is very small on a per capita basis, but they are significant resources for many badly needed community projects. In the Burko hunting block there are 13 villages and each received USD\$697 for the 2003 hunting season.

#### **Community- based conservation**

The foundation of the CHCWP was visionary for its time. Implementing conservation initiatives incorporating local communities is now considered mainstream practice (Inamdar et. al., 1999).

The most prominent community-based conservation project is CAMPFIRE (the Communal Area Management Program for Indigenous Resources). It is a program in which trophy hunting generates income for rural development and wildlife management, with the hope of changing rural people's attitudes from being in conflict with nature to realising that their economic well being depends on becoming stewards of nature. Zimbabwe adopted a completely different approach, than Tanzania and Kenya, to wildlife management. In country, the Parks and Wildlife Act of 1975 marked a change in government policy toward ownership of wildlife resources. Zimbabwe's wildlife conservation regime officially recognised that wildlife was the property of those who lived on the land with it. Since that time, rural communities have had direct access to wildlife resources, and wildlife utilisation is an integral part of the country's land use strategies. Ultimately, CAMPFIRE is about wildlife as the best land use for arid low rainfall areas of Zimbabwe, both ecologically and economically. It attempts to link conservation, rural development and political empowerments to local communities.

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Community-based conservation is the key to the survival of wildlife in Africa, to involve rural residents in conservation efforts. As most of the people exist at a very basic subsistence level, it is argued that the best way to secure their involvement is to permit them to derive, once again, economic benefits from the wildlife. If animals have an intrinsic value which can improve the community's standard of living, then the community has a vested interest in protecting the source (Baker 1997). Community involvement in wildlife conservation is particularly important in Maasailand Tanzania as, as will be shown later, agropastoralism and other lands uses are competing for the supporting wildlife.

# 2.2 STUDY AREA

This section describes the location and the environment of the Burko hunting block and its plant, animal and human resources.

#### **Location and Size**

The study was carried out in the 'Burko' hunting block, Monduli district, northern Tanzania, Arusha region. The area is leased to Robin Hurt Safaris, a private and professional hunting operator, for hunting and game safaris. Tanzania has five levels of conservation or resource use areas, ranging from totally protected national parks and conservation areas, to open areas that allow multiple uses and often contain villages. Hunting blocks are primarily located in game reserves and game controlled areas, which represent intermediate levels of use. Monduli District is one of ten districts comprising Arusha region, which is situated in the North Eastern part of Tanzania. It is the largest district in Arusha with a surface area of 16,061 square kilometers occupying 18% of the Region.



**Population and Demographics** 

In 2002 Tanzania's population stood at 34,443,603 (see table 1). It is one of the poorest countries in the world in terms of Gross Domestic Product and most of Tanzania's poverty occurs in the rural areas that are home to 77% of the population (Tanzanian Census 2002).



Table 1. Population of Tanzania, Census Counts. Source: Tanzanian Census

2002

The annual average annual growth from 1988 to 2002 in Tanzania was 2.8%, with a growth rate of 4.0% in the Arusha region (see table 2).



Table2 . Average Population Growth Rate: Regions 1988- 2002. SourceTanzanian Census 2002.

The Monduli District has a population of 184, 516 (see table 3). The majority of people are rural residents.

Table 3. Monduli District: Total Population by Sex and Area. Source: Tanzanian Census 2002

	Total				
	Both				
Sex	Sexes	Male	Female		
Total	184,516	89,676	94,980		
	Rural			Urban	
Both			Both		
Sexes	Male	Female	Sexes	Male	Female
160,521	77,929	94,840	23,995	11,747	12,248

People's main livelihood strategy is agro-pastoralism, i.e. husbandry of cattle,

goats and sheep and the cultivation of land for generally maize and beans.

- Livelihood Systems The main economic activities in Monduli District are pastoralism, agriculture and tourism whose basis is wildlife.
- Agriculture. Crop farming is done by a big percentage of households including Maasai pastoralist. Small-scale farming is done for subsistence.
- Pastoralism. Livestock keeping is the dominant economic activity in terms of employment and income contribution in the District. Transhumance is the typical mode of pastoralism, which involves extensive grazing of livestock seasonally to allow sustainable exploitation.

The livestock reared in the district include cattle, mainly the short horn zebu type, sheep, goats and donkeys. Cattle primarily supply food in form of milk while goats are frequently slaughtered for meat. Cattle also supply meat that is consumed occasionally, and especially for rituals and blood mixed with milk is consumed during difficult drought periods. Livestock also provide a basis of exchange for other products. They are sold in the market to facilitate the purchase of alternative foods, clothing, human and livestock drugs, to pay for school fees and other household items.

The total land area of Monduli district is 1,420,000hectares. In 1997, 98,800 hectares was estimated for agricultural land use. It is estimated that about 85% of the population are Maasai. Mixed agriculture is traditionally only practiced mostly by non-Maasai, but pastoralists have also recently taken agro-pastoralism as a form of diversification and to combat livelihood security.

Arusha region is the home of the majority of pastoralist groups. Nearly 60% of the regional area is grazing land (for both livestock and wildlife). The national sample census by the Ministry of Agriculture estimated that in 1994/1995, Arusha region has a total of 3,966,677 animals, ranking it first in the country (see table 4). According to the 1994/1995 national sample census of agriculture, the livestock numbers fluctuated between 1984 and 1994 as indicated in the table below.

Table 4 Comparison of livestock population basing on 1984 census and

#### 1994/1995

Fype of Livestock         1984 Census		1994/1995 sample	% Increase or
		census	decrease
Cattle	1,855,880	1,477,590	-20.4
Goat	1,231,014	1,648,474	+33.9
Sheep	758,476	722,168	-4.8
Donkeys	107,768	102,472	-4.9
Pigs	55,223	15,973	-71.1
Total	4,008,361	3,966,677	-1.0

The above table shows that the overall livestock population in the region decreased by 1%. These figures on decrease of livestock seem to tally with reports from the villages visited whereby villagers reported that livestock have been decreasing in the last 5 years. This is explored further in later sections.

# Physical features, climate and vegetation.

Monduli district has a rugged and diverse landscape. The lowest point of the District is at Lake Natron, which is 600 metres above sea level, and the highest is at Ketumbeine, which is 2,900 metres above sea level. There is also an active volcano at Oldoinyo le Nkai and several salt lakes and pans such as Lake Natron and Manyara. The Great Rift Valley passes through the district creating the vast flat Maasai steppes. Because of the variable topography, the climate and vegetation as well as rainfall patterns are similarly variable. Various types of grasses dominate low arid lands, which comprise 53% of the District. Semi-arid lands cover 34% of the Monduli (MDC 1997: 12). The area is fairly hilly Acacia woodland with scattered open grasslands and sparse settlement of Maasai communities.

East African rangelands mostly overlie old acid Precambrian basement rocks which generate infertile soils (Pratt and Gwynne 1977). Around 95% of the land area of Africa has infertile soils of this type (D'Hoore 1964; Allan 1968).

#### Climate

Climate is discussed in terms of the concepts of the seasonality, year to year variability and droughts. Approximately 80% of the land area is classified as semi-arid as defined by DFID (ODA, 1994). The most important aspect of climate in this region, as in all other largely semi-arid areas, is rainfall. In theory, Burko gets bimodal rainfall with the 'short rains' between November and January and the 'long rains' from February through April, with a prolonged dry season from June through October. However, rainfall is highly variable (Van Keulen and Seligman, 1992, Quinn et al. 2003). The short rains are rather erratic, sometimes even absent, and their onset may be delayed. Frequent long periods of drought are experienced in some places in Monduli with some areas so susceptible to drought that they experience loss of livestock and famine every three to four years. The rainfall varies between 400mm and 900mm a year with the mean annual rainfall at 650mm, and the mean annual temperature is 22°C (Prins & Loth, 1988). Seasonality plays a big role in the life of Monduli residents, with the dry season usually causing hardship to pastoralists and their livestock. Rainfall is highly seasonal and extremely variable within and between seasons and years. Thus, most authors generally place it in the zone of transition to a single rainy season (Griffiths 1962, Pratt and Gwynne 1977). The great variation in timing of the rainy season, typical for semi-arid areas, means that many months of the year from November to May show an appreciable average rainfall.

Waller's analysis (1976: 30) shows partial or major rain failure in some part of Kenya Maasailand once every two to three years during 1912-1930. The concept of drought has received considerable attention in the last decade (Glantz 1987, Rasmusson 1987). It cannot be defined in purely physical terms, as it severity depends not only on rainfall totals and timing but also on land use, and on the social and ecological options and experience available. Many authors have looked for periodicity in rainfall patterns which bring recurring droughts of significance to pastoralists, but cyclical patterns were not evident in Pennycuick and Norton-Griffiths' (1976) analysis, not in data from nearby ecosystems. However, other characteristics are revealed by long-term data for stations

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throughout sub- Saharan Africa. East and Southern Africa are characterised by short term fluctuations and tend to show short term severe droughts of one to three years duration, with overall wet or dry spells of two to six duration. This is borne out for Kenya Maasailand in 1912- 1930 by Waller (1976); and for East Africa generally in 1933-1984 by Rasmusson (1987) quoting Ogallo and Nassib (1984). Both general East African patterns and local data show that periods of four year's consecutive below-average rainfall are not unusual (Pennycuick and Norton- Griffiths 1976).

#### 2.3 THE ECOLOGICAL SIGNIFICANCE OF THE STUDY AREA

The Burko area is an important corridor for migrating wildebeest and zebra moving (Tarangire Conservation Project 1998). Wildlife moves through the hunting block regularly each year, as part of a large migrational route through surrounding national parks. The area is of major importance to the northern Tanzanian ecosystem and the Serengeti- Maasai Mara Ecosystem (SME) as it is located between and adjacent to many protected areas. It is north of Tarangire NP and east of Lake Manyara, and surrounded by the Ngorongoro Crater Conservation Area and the Arusha, Kilimanjaro, Maasai Mara, Serengeti national parks.

Tarangire National Park and the surrounding areas in Northern Tanzania, including Burko, hosts one of the most important populations of wild herbivores in East Africa and the largest populations of elephant in Northern Tanzania. The ecosystem supports some of the biggest large-mammal migrations in Tanzania. During the rainy season most herbivores leave Tarangire NP and move to the Maasai Steppe until the dry season. Tarangire is the dry season wildlife concentration area for all of Eastern Maasailand (Borner 1985, Lamprey 1964). Several species of large mammals have large migratory populations that possibly interact with each other and exchange genes with other populations some 90km away near Lake Natron (Lamprey 1964; TCP, 1997). The ecosystem supports some of the biggest large-mammal migrations in Tanzania. During the peak dry season wildebeest, zebra, Thompson's gazelle and Grant's gazelle concentrate in Tarangire and Manyara National Parks and the Simanjiro Plains. Other species





include buffalo, impala and Coke's hartebeest. The ecosystem is also heavily utilized by Maasai livestock. During the dry season Maasai cattle (Bos Taurus Linn.) constitute about 90 per cent of the grazing biomass (500 kilograms per square kilometre) of the Simanjiro Plains. Other livestock species include goats (Cappra hircus Linn.), sheep (Ovis aries Linn.) and donkeys (Equus asinus Linn.).

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This area is in fact considered as one single ecosystem. TCP (Tarangire Conservation Project 1998) defined a study area (Tarangire area) on the basis of bibliography, suggestions of local experts and organisations, and preliminary field surveys. One of the criteria drawing its boundaries was an area potentially including the seasonal movements of large mammals from Tarangire (Lamprey, 1964; Borner, 1985). The Tarangire can also be termed as The Masaai ecosystem. It has high local diversity and large numbers of large wild herbivores and livestock. Such diversity and abundance is maintained by ecological segregation though size, habitat and food preference, as well as migration.

The Tarangire area extends for 25,00 sq. km in Northern Tanzania (see figure 3) and is more than 10 times as large as the Tarangire NP itself (approximately

Figure 4 The Tarangire Area. Source: TCP 1998



2,600 sq.km). Its western boundary follows the edge of the Rift Valley, roughly along the  $35^{\circ}$  45; meridian; its southern boundary follows the edge of the busy area along the  $5^{\circ}15'$  latitude south; its eastern boundary roughly follows the

37°00' meridian in the southern portion, and the 36°35' meridian in the northern portion pointing towards the Kenyan border; and its northern boundary follows the border between Kenya and Tanzania. This area is experiencing rapid demographic growth and the human impact on the environment of agropastoralism and (small-scale cultivation) is increasing. As a consequence Tarangire NP is at risk of becoming an island park and the long-term survival of its large migratory herbivores is therefore threatened. (Tarangire Conservation Project 1998).

Tanzania has a well established, worldwide reputation for its incredible wildlife and national parks. Tourist revenues are an important part of national and local economies. However, current trends in agricultural expansion and population growth will threaten Tanzania's wildlife in the future. The government needs to realize this emerging problem and actively seek ways to ensure that local populations have economic incentives to help conserve lands and wildlife (Evans 2002).

# 2.4 TROPHY HUNTING

The international community has long seen foreign tourism as a potentially profitable economic venture that is compatible with conservation in a way that other forms of human land use are not (Eltringham 1984). Tourism is seen as the 'only way for Tanzania to generate foreign exchange and improve her economic status' (Minister for Lands, Natural Resources and Tourism 1989).

Conservation philosophy has swung away fro the traditional approach of setting up reserves to give absolute protection to wildlife and is replacing it with more realistic strategies. To succeed today, conservationists should take into account the needs of the people who share their land with wild species (Eltringham 1994). In the last twenty five years, wildlife conservation has moved towards the principle of sustainable utilisation. "Sustainable utilisation is the use of components of biological diversity in a way and at a rate that does not lead to the long term decline of biological diversity, thereby, maintaining its potential to meet the needs and aspirations of present and future generations" (Barrett 2001) The World Conservation Strategy (IUCN 1980) of 1980 supports all forms of wildlife exploitation, provided they are carried out sustainably, on the grounds that the income so generated will increase support for conservation. This has led to the assumption that wildlife, if it has to be conserved, must pay its way. One form of sustainable exploitation is trophy (sport) hunting. Tourism hunting is no more than the killing of animals for the most profitable use possible at the fastest rates each species can withstand (Barrett 2001).

Trophy hunting is a specialised and high-cost form of tourism. Trophy hunting in Africa attracts fewer clients than game viewing but it is much more expensive so that the profits are greater per unit investment. Trophy hunting has more revenue- producing potential (Baker 1997). It is a highly profitable and economically sound form of land use for regions lacking scenic attractions or wildlife spectacles and which are too dry for efficient farming or ranching. Trophy hunting provides significantly higher revenues on a per visitor bases than photographic tourism, and it may also impact the environment less severely.

According to Baker (1997), trophy hunting, while a consumptive form of ecotourism, is even less destructive than photographic tourism. Trophy hunters also contend that hunting brings more benefits to local communities and provides more revenue for wildlife conservation (Economist 1993). Trophy hunting is preferable to photographic tourism because

- Hunters are not nearly as ecologically destructive as tourists. Hunters require fewer services and accommodations, and less infrastructure, thus keeping wildlife habitats more pristine (Morrill 1993)
- The cost of a hunting safari in Africa many times that of a regular safari.
   A former director of Tanzania's Wildlife Department has commented that one hunter is worth 100 tourists to the local economy (Economist 1993).
- Areas hosting the most wildlife are often inaccessible to regular tourists, or practically inaccessible because of poor transportation services and infrastructure. These areas, however, are precisely those likely to attract trophy hunters, increasing both the number of visitors and local benefits.

A vigorous campaign has been mounted against sport hunting and several countries have banned the practice. Paradoxically, this has led to more animals being killed because the presence of hunters had a policing effect and once it had been removed, the poachers moved in. the loss of revenue fro the banning of sport hunting has also meant that fewer funds are available from central government for anti poaching activities, not only in the game reserves but also in the national parks (Eltringham 1994)

According to Baldus and Cauldwell (2004), tourist hunting in Tanzania has developed over a long period and is a principle source of income for vast areas of the country. The Wildlife Division of the Ministry of Natural Resources and Tourism has developed a command system of control that favours a select group of hunting outfitters with reduced income generation and the exclusion of rural communities who are the legitimate holders of the land upon which hunting takes places. More than 60 species can be hunted on a tourist-hunting license. Numerous hunting concessions are distributed throughout the country either in Game Reserves, Game Controlled Areas or Open Areas (Figure 4). The Wildlife Division leases the concessions on a five-year tenure to hunting outfitters that fulfil the requirements defined in a set of hunting regulations, and who have been authorised to guide foreign clients on big game hunting safaris. An Advisory Committee on Block Allocation appointed by the Minister of Natural Resources and Tourism screens applications by hunting outfitters and advises the Minister on the allocation of concessions. Concessions are not allocated according to a transparent market-driven system.



Figure 5. Protected Area, wildlife infrastructure game controlled and open hunting areas of Tanzania. Source: Baldus and Cauldwell (2004),

Each concession is allocated a quota of animals that can be hunted during the season (July to December). Outfitters must utilise the wildlife on quota to generate revenue not less than 40% of the value of the total quota allocated. Failing to do so, the outfitter is required to make a top-up payment to the Wildlife Division to meet the 40% minimum. The outfitter is further required to contribute to anti-poaching, road construction and community development. These requirements are set according to rather vague criteria. A professional hunter licensed by the Wildlife Division must guide clients on the hunt. Numerous hunting concessions are distributed throughout the country either in Game Reserves, Game Controlled Areas or Open Areas (Figure 1). The Wildlife Division leases the concessions on a five-year tenure to hunting outfitters that fulfil the requirements defined in a set of hunting regulations, and who have been authorised to guide foreign clients on big game hunting safaris. An Advisory Committee on Block Allocation appointed by the Minister of Natural Resources and Tourism screens applications by hunting outfitters and advises the Minister on the allocation of concessions. Concessions are not allocated according to a transparent market-driven system.

Table 5 and 6 provides a realistic overview of the magnitude of the industry as well as its growth over the past years (Baldus and Cauldwell(2004). Figures are confirmed by Kibebe (1994), Kitwara (1996), Tahoa (1999) and Pasanisi (2001). Approximately 20,500 hunting days are sold annually to 1,370 clients, generating a gross income for the industry of over US\$ 27 million from daily rates. In addition, many of the leasing companies have up to 40% mark-up on the trophy fees thus generating an additional US\$ 8.5 million. The taxable income in Tanzania is approximately US\$ 28 million, but many companies are subleasing their hunting to a third party which causes a loss in the actual taxable income in Tanzania.

Some basic facts that demonstrate the performance of the tourist hunting industry in Tanzania are presented below:

 Trophy fees represent 60% of the income generated by the Wildlife Division from hunting (table 5)

- Average income to the Wildlife Division per hunting client is approximately US\$7,000
- Income generation per unit area from all hunting areas of Tanzania is approximately US\$ 40 / km<sup>2</sup>. Hunting income per unit area for the SGR is approximately US\$ 70 / km<sup>2</sup>
- One hundred and forty one concessions are leased to 42 companies, however 32 different groups of companies exist. 51 concessions (36%) are leased to the 3 largest groups.

Item	Requirement	Cost
		Cost
Permit fees	For a hunting safari up to seven days	US\$450
	For a hunting safari more than seven days	US\$600
Conservation fees	Daily fee per tourist hunter	US\$100
Observer fees	Daily fee per person accompanying a tourist hunter	US\$50
Trophy handling	For a hunting safari up to seven days	US\$200
Fees	For a hunting safari more than seven days	US\$300
Block fees	Annual fee per concession payable by the outfitter	US\$7,500
Professional hunters	Professional hunters resident in Tanzania	US\$1,000
license (annual)	Professional hunters non-resident in Tanzania	US\$2,000

Table 5: Fees payable by tourist hunters and outfitters in Tanzania

Table 6: Overview of the tourist hunting industry in Tanzania

Year	Revenue accrued by	Gross income from hunting	
	Wildlife Division	industry	
1988	US\$ 1,200,000 ***	US\$ 4,600,000 *	
1992	US\$ 5,300,000 *	US\$ 13,900,000 *	
1996	US\$ 7,400,000**	US\$ 19,400,000 ***	
2001	US\$ 10,500,000 ***	US\$ 27,600, 000 ***	
Sources of data:	* PAWM (1995); ** BROOMHEAD (1997);		

\*\*\* Calculations based on hunting data of the Selous Game Reserve

## 2.5 MAASAI PASTORALISM

#### An Overview of the Maasai and Pastoralism in Northern Tanzania

An understanding of the Maasai way of life is essential to the finding of this thesis. The Maasai, their herds and the ecological implications of their land use are central to the theme of this study. No study or management of wildlife can be complete without reference to the human component of the ecosystem. It is impossible to sustain wildlife unless the solution includes the people whose lives and livelihoods are closely entwined with those resources. The ecology of the area is bound up with Maasai and their land use. It is the interactions of animal systems with people that are at issue.

The physical features and climate, i.e. the topographical as well as climatic diversities make the Maasai ecosystem operate in dynamics that are non-equilibrial (Behnke & Scoones 1992). This refers to African systems as non-equilibrium, where erratic and variable rainfall, as well as other climatic conditions, keep forage production and livestock numbers low, and livestock numbers do not have along term destructive effects, neither the vegetation growth nor the livestock numbers is a constant variable in dry lands of Africa.

Traditionally, the survival of the Maasai was based to a large degree on a wide spectrum of adaptive livestock grazing strategies designed to minimize the effects of droughts, these strategies included rotational grazing, organised management of communal grazing, and diversification of livestock herds and redistribution of stocks. In general, it was a sustainable and ecologically sound system (Arhem, 1986). Traditionally, the Maasai were grouped into geographically- bound sections (Olosho), which were self-contained ecological units with well-defined boundaries. These boundaries constituted limits of livestock movements and of control for pasture and water in the same territories. The Maasai had rules and regulations, which governed the use of water, pasture, animal movement and control of vegetation and trees. They had institutions, in the form of schedules for watering, for controlling communal use of the scarce water. The strategy was based on the availability of water as a determining factor for the extent of grazing during both the dry and wet seasons. It also

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determined the concentration of animals and pattern of settlement within the same rangeland (Ole- Kuney, 1993).

The pattern of land use and pasture utilisation which is practiced by the Maasai is transhumance, with organised grazing zones which are used rotationally in order to allow land to recover and vegetation to regenerate. Grazing resources were used seasonally, a regular movement of their herds between wet (lowlands) and dry (highlands) pastures. Maasai transhumance centres on a permanent homestead based in a drought refuge area with permanent water and lasting pastures. As the dry season progress the available forage within a day's return trek from the permanent boma deteriorates. As the rain begins to fall, the arid plains show local flushes of new growth. The herds are shifted from the dry season ranges higher up, where conditions are deteriorating for the livestock as the insect vector populations multiply, dormant and free-living stages of parasites emerge and increase, and the cold and wet foster both respiratory ad hoof infections. The main herds are moved down to the plains where stock thrive on the high quality, mineral rich, short grass pastures, and many calve at this time. Eventually herds are moved back towards the permanent homestead where they will last out the dry season with permanent water and lower quality but more durable long grass pastures (Homewood and Rogers 1991). The Maasai monitor changes in range conditions constantly to determine the effect of management actions and practices. Livestock and wildlife behaviour, milk yields, the condition of the animal's fur, mating frequency and colour and texture of the dung, all used as indicators to determine the value of the range.

#### Pastoralism Resource base and Utilisation of Range Resources

Pasture lands and other critical resources were held and used on communal basis, and access to range resources, such as water points, was assumed by membership of territorial sections or units. Each territorial section formed clusters of grazing communities, which governed the use of resources in each locality. . Territorial units were ecologically viable, and residents had rights of access to resources by virtue of being members of a given community. All pastoralists of such a given community were assured access to range resources i.e. access to grazing, water and salt licks for livestock They all play roles in the management of that habitat for sustainable optimum production of forage by using these resource utilisation and management techniques in order to ensure soil fertility is conserved and vegetation is allowed to regenerate. The seasonal movement of livestock between the highlands and lowlands manages the ecological variability. This traditionally managed accomplished both environmental preservation and sustainability. These transhumant strategies are dictated in any season by formal and informal regulations relating to frequency of utilisation of a given range. These arrangements provide for herd dispersion, pasture rotation, protection and regeneration, and in this way undue stress on fragile range resources was avoided.

Contrary to Hardin's (1968) argument on the "tragedy of the commons", members of each locality had a collective responsibility to manage and preserve resources in their area and to enforce exclusion of non-members. These measure ensured sustainable use of all range resources. The pattern of resource use by pastoralists was predicated on the avoidance or reduction of risks. Maasai movements of livestock, therefore, serve both ecological and socio-economic purposes in achieving adaptive and survival strategies that allow them to use fragile range resources sustainably. The significance of these environmental protection mechanisms is lost following alienation of the range to other uses (Kipuri, 1995). The new systems of land tenure and ownership were established and set aside indigenous systems relating to resource management and utilisation.

#### 2.6 PASTORALISM AND WILDLIFE CONSERVATION

Like livestock, wildlife migrates seasonally from low to high potential areas. Being non-hunters, the Maasai pastoralists have conserved the wildlife heritage for generations. But in recent years, it is being threatened by poachers, cultivation and unsustainable levels of trophy hunting.

There is an overt assumption throughout most of the sub-Saharan rangelands in general that wildlife do not overgraze while stock do (Lamprey 1983); that

wildlife land use is sustainable while livestock land use is not (Lamprey 1983); that wildlife should have the freedom to range throughout the savannah system while stock should not (Dirschl 1966, Ole Kuwai 1980); that stock present a competitive challenge detrimental to wildlife (Pearsall 1957; Ole Kuwai 1980) and that stock are generally less efficient and productive than wildlife (Simpson 1984a). The present section considers comparisons between the wild and domestic herbivore communities (particularly between wildlebeest and cattle, their respective dominant species) in terms of feeding, ranging and environmental impacts, and looks at their population interactions. The relative dominance of the wild versus the domestic herbivore communities is analysed for a range of wildlife/pastoralist joint land use system.

# Feeding.

The wild and domestic large mammal herbivores overlap in their feeding and habitat requirements. Wildlife feeding habits are reviews by Jarman and Sinclair (1979) and by McNaughton (1983, 1985) for the grazers. Niche separation is achieved by differential selection for coarse and fine scale habitats, plant species and plant part as well as by sequential movement patterns. Casebeer and Koss (1970) in a comparative study of the feeding habits of wildebeest, zebra, hartebeest and cattle on the Athi Plains of Kenya found that all four herbivore species preferred *Themeda triandra* to *Pennisetum mezianum*, which in turn was preferred to *Digitaria macroblephara*. Zebra were the least selective; their diet showing the closest similarity to the composition of the sward, and hartebeests the most selective. Cattle and zebra were the most similar in their diets. All four ungulates had a wide range of species in the diet, the range being widest in the dry season. However, cattle diets were the most consistent across seasons, more so than the varying combination of grasses available at different times of the years.

## Ranging

The continuum of range use patterns by livestock corresponds closely with that shown by the large ungulate wildlife. Both pastoralist stock and individual

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wildlife species show transhumace in the Crater highlands, but semi-nomadic or migratory movements in the Gol/ Serengeti area, (Maddock 1979, Sinclair 1983a). The close parallel between ranging strategies of pastoralist herds and of wildlife is dictated by their common dependence on critical grazing, mineral and water resources.

Maasai pastoralist management strategies evolved to optimise the production of calves and milk. Sinclair (1983a,b) stresses that with a fluctuating environment species that remain resident are regulated by the resources available at the worst time of the year. Such residents tend to be much less numerous than migrants, the small resident Serengeti population of hartebeest contrasting with the peak population of migrant wildebeest of similar size and ecology. Most wild ungulates and their associated predators have adopted the strategy of migration by following good resources. As resources become increasingly unpredictable so more nomadic strategies are adopted. Pastoralist's best strategies remain those migratory and nomadic movements that have evolved by natural selection in these fluctuating environments. Land use managers must provide for these strategies.

#### Population interactions: effect of cattle on wildebeest.

Watson, Graham and Parker (1969) suggested that cattle replace wildebeest as the dominant large herbivore in the Loliondo Game Controlled Area, while total large herbivore biomass remain the same there as in the adjacent Serengeti. Similarly, McLaughlin (1970) reported a 5% increase in wildebeest numbers one year after cattle were excluded from Nairobi National Park. In some views, the pastoralists and livestock are increasing to the point of becoming an environmental threat incompatible with other land use interests (Ole Kuwai 1980, Chausi 1985, Malpas and Perkin 1986). They are thought to be causing habitat damage ultimately prejudicial to wildlife condition and population size. However, historical and arcaelogical research suggest pre-1980s population and stock densistes comparable to those of today (Collett 1987). High densities may affect incidence of infectious diseases but are not seen as overtaxing grazing and water resources. In a thirty year period wild herbivore populations have undergone a dramatic increase (Sinclair and Norton-Griffiths 1979, Malpas and Perkin 1986). It is specifically the wildebeest, closest to cattle in body size, ecological requirements and strategies that show the most striking increase. This makes the idea of adverse competitive impact of livestock on wildebeest and other wildlife dubious if not untenable. The performance of the relatively favoured wildlife populations, documented over three decades, is the best proof that range utilisation by livestock is both sustainable and compatible with conservation values.

#### 2.7 THREATS TO PASTORALISM

While pastoralism seemed to be the most appropriate and sustainable land use system on the arid rangelands within which the Maasai have found themselves, it has however increasingly become constrained by a number of factors particularly the shrinkage of the land area and the alienation of critical resources.

The recent history of Maasailand is one of land loss and marginalisation. During the colonial period, extensive areas of Maasailand were alienated for estate farms and game reserves (Kjekshus, 1997), squeezing the Maasai into a smaller land area. Population growth rate in Maasaland grew rapidly to 4.2 per cent during the 1980s. This was higher than regional and national rates (3.8 per cent and 2.8 per cent, respectively) and was attributed to immigration and natural growth (Mlay, 1981; Mwalyosi, 1992b). In the mid-1970s introduction of the Tanzanian Villagization Programme led to the partial settlement of the nomadic Maasai and their subsequent change in lifestyle to agro-pastoralism. As a result, the traditional Maasai system has been supplanted by new power structures. In effect, villagisation represented a step towards the imposition of a new settlement and land-use pattern that is difficult to reconcile with pastoral values. The tightly knit and sedentary settlement pattern has restricted the nomadic lifestyle of the Maasai and game animal migration. The result has been a reduction of dry season pastures, a decline in pasture quality due to overgrazing, an intensified competition between wildlife and livestock for pasture and water, and a restriction of individual livestock holdings and herds.

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Governments often see the pastoralist way of life as backward and incompatible with administrative goals such as tax collection, provision of health and education services, economic development and the promotion of national unity. The socialist villagisation programme, or Ujaama Policy, in Tanzania of the 1970s marked an important phase in the Maasai social, economic and political transformation. First, it relocated the Maasai settlements into semi-permanent villages throughout Maasailand. Yet the grazing rights of pastoralists were not catered for. Village communities found it difficult to agree on protecting grazing blocks, preferring instead to cultivate everywhere. The Villagisation process created uncertainty of tenure for pastoralists. The Ujaama Policy encouraged land grabbing and the Maasai people have been deprived of their traditional lands and, therefore the resources necessary for their pastoral way of life (Morindat 1997). The traditional and sustainable Maasai system of rangeland resource management was supplanted by new power structures. This trend has imposed a new pattern of settlement and land use that is difficult to reconcile with pastoral values. The new pattern of land use has led to habitat loss, resource degradation and extinction of both plant and animal species.

The most serious threat in the region is the loss of land and key resources that are critical for the survival of herds. Large tracks of land have been alienated from pastoralists and placed under other uses. The alienated lands are the betterendowed areas in this district. The loss of these areas has increasingly made pastoralists more vulnerable to drought. Loss of dry season grazing areas, increased agriculture in marginal areas and subsequent land degradation, increased population mainly through migration and increased livestock mortality through livestock diseases have also militated against pastoralism and contributed to the decrease in the numbers of livestock and the ability of pastoralists to subsist from their own produce

In Monduli for instance, many hectares have been alienated for an army camp and exercises on the foot of Monduli Mountain; the other portion of the mountain has been gazetted as a forest reserve; the high potential south western parts of the district have been used to settle peasants from the agricultural Arumeru District; and most of Manyara ward is gazetted as a National Park and access to it by
pastoralist and their herds has been denied. The areas that have been alienated from the Maasai comprise dry season grazing to which pastoralists resorted during drought conditions and which contributed to survival of herds. The consequence of reduced resource base includes the following: it has rendered the usual daily and seasonal migrations more difficult, expensive, dangerous and often impossible, depending on the area.

The resource base has been reduced in quality and quantity and this has in turn reduced the numbers of livestock that can be kept per household, hence decreased viability of the pastoral economy. Since livestock are the productive asset of pastoralists, their decrease in numbers also implies increased poverty. The current livestock biomass per household is only 6.4 units, which is 74 per cent less than the minimum estimated biomass requirements for a Maasailand household. In order to meet household requirements, pastoralists have been forced to grow crops (Mwalyosi, 1992b). Because yields are relatively low, production is improved by expanding cropland at the expense of grazing. This is evidenced by the dramatic increase in ox-drawn ploughs during the 1980s (Mwalyosi, 1992b). More and more of Maasailand is coming under the plough and with this, biodiversity is being eroded. Between 1957 and 1987, cultivation in southwest Maasailand increased by about 450 per cent, whole woody cover decreased by 77 per cent, contributing to a 16 per cent increase in grassland and 33 per cent increase in bare ground (Mwalyosi, 1992b). The carrying capacity of cropland (0.4 hectares per capita) is already exceeded by about 86.5 per cent, while that of grazing land (2.9 hectare per capita) is below requirement levels by at least 87 per cent. These developments are likely to have profound effect on the management of the pasture resources and biodiversity in general.

A doctoral thesis in the Ngorongoro Conservation Area by Dr. T. Potkanski and the 1994 census painted a grim picture. Cattle population was now at the same level an in 1964. The average livestock head per household was 3.4. LU, whereas 9 LU is considered to be the threshold of viability. Mortality especially from East Coast Fever (ECF) were around 70% of all calves born and 15% among the mature stock. As a result of all the above the percentage of 'destitute' and very poor has now reached new and unacceptable heights- 37%. Livestock holdings, productivity and herd composition have all decreased. In 1970s, the average livestock per capita was 14 head of cattle and about 112 head of cattle per household of eight people. In addition, people had goats and sheep to supplement what they get from cattle. It was common to have a family of 6 households with 700 head of cattle and about 500 small stock. In early 1994, the herd sizes declined. At present it is estimated that a middle-income household has about 14 to 17 head of cattle, 11-75 goats, 6-36 sheep and 1-5 donkeys (Meindertsma & Kessler 1997). Poor households are found to have less cattle and more small stock. In high potential areas, it is estimated that 16 head of cattle per capita is required in order to subsist and live slightly above the poverty line. In low potential areas, 20 head of cattle, this means that each person had about 3 head of cattle. This is far below what is needed for subsistence.

It is estimated that a family size equivalent to 6.5 adults needs 21 kilograms of milk a day, which requires at least 35 to 40 head of cattle (Widstrand, 1975). The dwindling livestock units per household suggest that subsistence requirements cannot be fully met from livestock. Milk yields of local zebu cows is below 250 kilograms per annum; considering the high calving rate (60-70 per cent) and short lactation period (155 days), it seems difficult to expect more than 180 kilograms of milk to be available for human consumption from one cow in one year. To produce one litre of milk, a cow needs nine kilograms of fodder (Stiles 1998). With the diminishing rangelands, decline in livestock productivity is inescapable.

Environmental destruction has increased as livestock are forced to concentrate on small marginal areas that used to be utilised seasonally. Following these changes, many pastoralists are finding themselves increasingly vulnerable and unable to provision their own livelihoods. Some deaths have been reported particularly in Monduli following the drought prior to food aid being distributed in late March 1997.Arhem (1985) and Potkanski (1994) both noted that the livestock: human ration fell from 10 to 3 livestock per capita in the last 30 years. In this period, the average herd size per household has been decreasing while the numbers of small

stock has been increasing. Some studies one in the area maintained that the livestock structure in Monduli is 53% small stock, 44% cattle and 6% donkeys (MDP 1995:16). For pastoralists, this is an indication of increased levels of poverty and vulnerability. In his sample, Potkanski observed the social stratification, with the wealth ranking of 12%, 23% middling, 25% poor and 40% destitute. In a study done on the Maasai of Simanjiro, Muir (1994:40) noted a similar pattern, with 14.0% wealthy, 41.5%middling, 28.9% poor and 15.7% very poor. In NCA, the wealth distribution according to the same census indicates that approx 58% of the pastoralists in the NCA live below the recognised poverty level set by the Maasai pastoralist. 21% of pastoral families are destitute. 16% are very poor. 21% are poor. 20% are middling. 22% are rich.

This 'compression' of the herds on a much smaller area has had the inevitable, but logical consequence of increasing the disease incidence and therefore mortality in the livestock, which has been exacerbated by restrictions on burning, the original defence of the pastoralists against, especially tick borne diseases, and by the inadequacy of the veterinary services. Reports from district officials and PARDEP survey of 1997 showed that there have been increases in incidence of disease. Diseases increase has been exacerbated by the withdrawal of government subsidies in the livestock sector and consequently, a discontinuation of livestock services in the country. The ecology of Monduli is variable, with lots of semi-arid and arid areas, which are infested with tsetse flies and ticks are many in different seasons. These two vectors are the main source of Monduli of common livestock livestock diseases in the district.

As a result of the above constraints, subsistence agriculture increased as the pastoralist did what all pastoralists have always done when in distress- turn to agriculture. As a means of avoiding starvation or of rebuilding a herd destituted by disease or drought, the Maasai have always cultivated small plots. As mentioned above, Monduli has experienced alienation of key pastoral resources. In order to cope with the new situation, this alienation has forced many of the pastoral communities have been forced into agro-pastoralism. Maasai pastoralists have adopted agriculture, in the form of crop farming, as a survival strategy, as a

form of diversification and mitigating risks, as well as a way to assert their rights to land. The Maasai have always practicing cultivation as a means of income diversification. The notion of the Maasai being perceived as 'pure' pastoralist can mask the reality that they have, when times demanded, engaged in other forms of economic activities. (Homewood and Rogers 1991).

This state of affairs was confirmed during a survey when most of the interviewed villagers indicated that they all practiced small-scale agriculture to supplement their livestock produce. The studies undertaken recently in the district (MDP 1994, PARDEP 1997) indicate that there has been a gradual shift from pure pastoralism to agro-pastoralism. During the PARDEP survey, 100% of the interviewees in all the 8 villages visited reported they practice some agriculture. They were emphatic though in stating that they did so as a way of diversifying sources of food and spreading risks. All of them never thought of agriculture as an alternative to pastoralism, but rather, agriculture has been adopted in order to reduce the frequency and intensity of food insecurity.

The immediate reaction to the shrinkage of the resource base by adaptation of agriculture has increased conflicts in pastoral areas, has further constrained pastoralism and created environmental destruction of marginal lands. These marginal areas are too dry for rain-fed agriculture, although extensive areas have recently been converted to cropland, thus reducing the amount of grazing land. This is a result of increased human population pressure and the subsequent increased demand for land to grow food crops.

Conflict over land in Maasailand has manifested itself in various forms. There has been a noticeable increase in conflicts between wildlife and the Maasai agropastoralists. There competition exists between livestock versus wildlife and wildlife versus crops. These will continue to rise in extent and intensity with possible serious consequences.

#### **2.8 PROBLEMS AND CONFLICTS**

#### **Problems and Conflicts from Agro-Pastoralism**

In recent years, 1970s- 1990s the lives of the pastoralists Maasai in Northern Tanzania has continued to deteriorate rapidly. There is a lack of basic needs such as water, food, education, health service and infrastructure. (Morindat 1997). Reasons for this critical situation of the Maasai people. These include the lack of coherent state policies, vision and recognition of the values and strength of the pastoral production system (Ngdala 1991, Tenga, PINGOS 1996).

#### **Biodiversity Conservation**

The introduction of crop production in Tanzania's Maasailand is likely to have a profound effect on biodiversity conservation. The term agro-pastoralists describes someone is a farmer and who also keeps freely grazing livestock. As described above, the East African arid and semi-arid areas are characterised by a short rainy season with irregular intense showers, a long dry season with no precipitation and high evapo-transpiration. These conditions make the area too dry to sustain rain-fed agriculture. Originally, such marginal areas had low human populations because of their low and unpredictable primary production. In recent years, however, human population has increased in these areas and rangelands are being opened up for crop cultivation. Many previously pastoral communities now base their livelihood on settled agriculture and semi-pastoralism, i.e. agro-pastoralism. This change in land use may affect the ecology of the rangelands in various ways. It may reduce biological diversity, which will accelerate environmental degradation and so threaten the future of both human and non-human life.

Biodiversity conservation in the Maasai ecosystem has mainly been confined to the protected areas. It is now realised that there is significant biodiversity in the non-protected development areas. These lands are subject to increasing degradation and resultant biodiversity loss because of human population pressures. Degradation of natural resources has an adverse effect on the conservation of biodiversity, and so endangers species in two distinct ways:

- Land degradation directly affects protected areas (PAs) or triggers the dispersal of game populations into adjacent public or private lands, which often results in direct encroachment and reduction on productivity; and
- Land degradation leads to reduced returns for local communities and industries, so causing a further demand on resources of other nondegraded lands including PAs.

Lake Manyara National Park can be regarded as an 'island' since the adjacent area supports a number of human economic activities, mostly rural agriculture. Since there are no wildlife corridors, problems associated with crop damage are likely to occur frequently in the adjacent human settlements and especially during the dry season when pastures within the park become limiting.

Previous studies (Heady, 1960; Peterson and Peterson, 1980) suggest that in the past, Themeda- Hyparrhenia grasslands dominated Maasailand. Peterson and Peterson (1980) reported the disappearance in the late 1970s of *Themeda triandra* throughout the Maasailand. The change was attributed to the lack of burning and to overgrazing by livestock and wildlife. In the absence of fire this species declines, which might be the case in the Maasai ecosystem. The absence of fire is mainly due to low fuel loads; high grazing pressure keeps grass cover low. The short grass stage in East Africe is condiered by Heady (1966) to be a retrogression from the original climax formation. Further evidence of retrogression in Maasailand is shown by the higher incidence of annuals than perennials, and of unpalatable grasses (Mwalyosi, 1992a).

Soil erosion is the clearest manifestation of declining range condition (Wilson and Tupper, 1982). The soils of the study area are highly susceptible to erosion (Ecosystems, 1980; Hathout, 1983). The lack of vegetation cover in overgrazed areas resulted in excessive surface run-off and gully erosion during the rainy season. Gullies were also initiated by human tracking, and more often by cattle tacking to and from grazing and water sources.

#### Human-wildlife Conflicts

The literature on African land use has many examples of grazing communities where wild and domestic herbivores are, or were, closely integrated. The Simanjiro Plains in Tanzania (Kahurananga 1981) are cases in point. The wild and domestic grazing communities are usually perceived to coexist in harmony when resources are abundant. However, both pastoralists and conservationists in these systems complain of competition when resources are in short supply whether due to herbivore population increase or to drought, fire, lake or flood level changes. With human help in providing water and locating available fodder, domestic stock become extreme generalists and can dominate the system (e.g. Kahurananga 1981; Western 1971). Conflicts can arise even from a compatible pastoralist/ wildlife land use system.

There are other conflicts arising. In many parts of Africa local people report conflict with wildlife over damage to crops, livestock, property and the threat posed by wildlife to human life as a significant cost of living with wildlife (Parry & Campbell, 1992; Kangwanga, 1993; Newmark et al., 1994; Naughton- Treves, 1996; Hill, 1997a); Weladji & Tchamba 2003). A simple Knowledge, Attitudes and Practices survey, by the African Wildlife Foundation, illustrates some negative aspects related to living close to a protected area (see Table 7). Of these problems, wildlife crop damage is often the major cause of humanwildlife conflict, particularly in situations where the lands of agriculturalist communities' border protected areas. A survey of local people living adjacent to six protected areas n Tanzania found that 86% of respondents (n=1,396) reported problems with wildlife causing crop-damage (Newmark et al, 1994). Crop damage, which is defined as feeding on cultigens by wild animals, can cause substantial financial losses for farmers (Newmark et al., 1994) and a source of conflicts with protected areas. Crop damage results into a spirit of negative attitudes towards wildlife conservation. Crop damage was reported to be a serious problem by the local communities living adjacent to Lake Burungi in Tanzania. As many as 93% of the respondents claimed frequent crop damage (Moe et al., 1992), with little or no help from the adjacent Tarangire National Park (Moe et al., 1992). Newmark et al. (1993) reported that over 71% of the

Problem	Lake Manyara	Arusha
	n=1597	N=983
Livestock related	48%	20%
Destroy crops	82%	95%
Threat to security	62%	33%
Ranger disturbance	31%	16%
Cannot increase farm size	38%	29%
Not allowed to cut trees		24%
for fuel		
Not allowed to graze in		16%
park		
Other		6%

Table 7. Negative aspects of living next to protected areas and wildlife in East Africa. Source: AWF 1993 in Bergin 1997.

% of people responding who recognised the problem as a concern

local communities living adjacent to six protected areas in Tanzania (Selous Game Reserve, and Arusha, Kilimanjaro, Tarangire and Lake Manyara National Parks) cited problems with wild animals. Furthermore, Kabigumila (1992) reported significant damage to life and property in villages around Mkomazi Game reserve. The most frequent damage was destruction of crops. Other less common forms include predation of livestock and loss of human life. In the Epimack and J. Kabigumila study, all of the local communities living adjacent to Lake Manyara were aware of the chronic problem of wildlife damage to their crops and several farmers suffered financial losses due to crop damage by wild animals from the park. Newmark et al. (1993) showed that over 91% of the local people cultivated crops in areas adjacent to the protected areas and that most were subsistence farmers. Therefore, the loss of even a small proportion of their crops to wild animals can present severe economic hardship.

Agricultural losses due to wild animals is higher in Africa than elsewhere in that the average loss is 40% of all crops that are planted (Nahonyo, 2001). Crop damage and livestock destruction are major sources of economic losses (Newmark et. al 1994; Tchamba, 1996), and local communities have in turn threatened wildlife by poaching and by causing habitat loss through encroachment of farms into habitat (Balakrishnan & Ndhovu, 1992; Njiforti, 1996). According to Epimack and J. Kabigumila, with increasing human pressure on many protected area, human-wildlife conflicts are becoming more common. Workers such as Saj et al (2001) have reported in particular crop damage as becoming a more widespread and complex problem in most countries. In Tanzania, conservation is strongly influenced by problems with wild animals (Newmark et al., 1993; 1994) and has been a source of long standing conflicts between local communities and protected areas (Matzke, 1976). In countries where the economy is primarily based on agriculture the well being and stability of the life support systems depends on effective management of natural resources. Bergin (1997) showed that any conservation oriented-program should have beneficial to the local communities adjacent to protected areas. In the absence of direct beneficial links to wildlife resources, local communities discount the importance of wildlife as a resource and the subsequent outcome of this problem is an increased mismanagement an unsustainable utilisation of wildlife and habitat by local communities.

#### **3.0 RESEARCH METHODS**

In northern Tanzania, however, where conflicts between people and wildlife are threatening sustainable conservation, information on the nature of the conflict is lacking. The effective long-term conservation of wildlife areas requires the support of the people who experience the direct impacts of wildlife (Kiss, 1990; Western & Wright, 1994) Local people cannot be expected to provide this support if the costs of doing so outweigh the benefits, i.e. if the existence of the hunting block and its wildlife have negative impacts on local livelihoods (Murphree, 1996).

This paper is based on interview data from 3 villages in northern Tanzania, collected in 2004 as part of a study to investigate the relationship between wildlife and people and to examine whether sustainable trophy hunting can be a tool for resolving the conflict.

Three villages were selected for household interviews in the Robin Hurt Safaris's 'Burko' hunting block. These villages were selected for this study, in villages that represent the highest conflict between people and wildlife, as perceived by Cullman & Hurt field officers. This study requires data perceived by individual people in village communities. The survey was conducted in 3 Burko villages using semi-structured interviews. The 3 villages were Arkaria, Lepurko and Mti Moja. Survey data were collected during May- June 2004. No random sampling frame was readily available for the selection of a probability sample. Instead, the interviews were administered to individuals chosen opportunistically with some direction from a village guide.

70 people were interviewed in three villages, of which 7 were female, giving a 10% sample of all households present in the study villages. Respondents were individually interviewed in Maa with the use of a translator. Respondents interviewed were the head of the household or the wives of household heads. The ethnic group of all respondents was Maasai. The average respondent was male, aged 50 with 3 wives and 12 children. He cultivates 13 Ha, growing maize and

beans and owns 27 head of cattle and 53 head of goats and sheep.

Information was collected on the crops grown and their yields, crop types, acreage, crop damage trends, the species of wildlife responsible, livestock type and number, number killed by wildlife and the species responsible, and current market prices. By multiplying the current market price of each livestock species predated by the number predated and summing for each household, the income lost due to wildlife predation was estimated. This method was repeated to estimate the income lost due to other causes, e.g. drought and disease. The income from crops was estimated as the number of bags harvested multiplied by current market price.

Respondents were asked to identify the problems that they faced when providing for themselves and their families. Respondents were not restricted in the number of problems they could list. Rather than raising the idea of problems directly, the interview used questions that were carefully phrased so as to be open ended and non-leading.

Respondents were asked about the benefits received from wildlife. As a measure of community attitudes towards Robin Hurt Safaris and Cullman & Hurt Community Wildlife Project respondents were asked about the relationship. Perceptions of human-wildlife conflict were examined to ascertain the perceived importance of wildlife conflicts as a constraint on agricultural productivity and livelihood, the wildlife species responsible. This study also investigated conservation attitudes; respondents were asked if they would like to see the number of wildlife increase, when deriving benefits but also without deriving benefits.

Although most studies of wildlife crop-damage are based on surveys of local people's perceptions of the problem and its impacts, it is recognised that the perceived and actual costs of such conflicts do not always match (Bell, 1984; Kangwana, 1993, Naughton- Treves, 1997, Siex & Struhsaker, 1999). For this reason, this paper presents only an analysis of patterns of livestock loss and a further analysis of perceived human-wildlife conflicts (including crop damage)

and trends in this conflict. This paper also examines the major concerns and risks to livelihoods faced by rural communities in semi-arid Tanzania. Its aim is to identify factors influencing local perceptions of problems. Furthermore, this paper investigates the conservation attitudes of the Maasai living within the hunting block. Little is known about the frequency and extent of crop damage by large wild herbivores. This study examined the role of large herbivores in crop damage, and their impact on community attitudes to the conservation in the adjacent Lake Manyara Park.

## Problems

Perceptions can also be influenced by power differential between local people and researchers (Leurs 1996). It is not possible to rule out the possibility that some respondents gave the answers they felt were most likely to lead to benefits through project investment. In the villages previous research had been carried out with no tangible benefits for villagers in the form of project implementation or support. In the villagers, villagers asked how this study would help them when they had perceived no tangible results from past research.

# 4.0 RESULTS

Personal and data relating to household livestock and harvest economics is presented here.

		Mti			
RN#	Arkaria	Moja	Lepurko	Sum	Av
Age	53	42	56	151	50
Wives	2	2	4	8	3
Children	9	7	19	35	12
Date stopped nomadic	1976	1976	1970	5922	1974
Date Started Farming	1,973	1974	1972	5919	1973
Cattle	34	20	27	81	27
Goats	47	16	34	97	32
Sheep	29	13	21	63	21
Cattle Sold	4	3	5	12	4
Goats Sold	9	5	8	22	7
Sheep Sold	3	3	5	11	4
Cattle Market Price	152,143	88438	135,000	375,581	125,194
Goat Market Price	12,824	13588	13,125	39,537	13,179
Sheep Market Price	10,700	13933	15,075	39,708	13,236
Cattle Income Last Annum	678,333	271250	719,000	1,668,583	556,194
Goats Income Last Annum	178,824	73000	100,850	352,674	117,558
Sheep Income Last Annum	49,400	52350	74,400	176,150	58,717
Cattle Killed Wildlife	1	1	4	6	2
Goats Killed Wildlife	9	3	4	16	5
Sheep Killed Wildlife	4	2	3	9	3
Cattle Other Losses	7	6	13	26	9
Goats Other Losses	11	3	15	29	10
Sheep Other Losses	9	6	7	22	7
Cattle Born	12	11	17	40	13
Goats Born	20	7	19	46	15

Table 8. Personal and Livelihood Economics Data

Sheep Born	12	8	14	34	11
Ha	15	11	14	40	13
Maize Bags Harvested	14	7	5	26	9
Beans Bags Harvested	8	4	4	16	5
Maize Bags Sold	1	0	-	1	0
Beans Bags Sold	5	2	-	7	2
Maize Market Price	20,250	0	-	20,250	6,750
Beans Market Price	30,222	29500	-	59,722	19,907
Maize Income Last Annum	25,500	0	-	25,500	8,500
Beans Income Last Annum	99,667	65600	-	165,267	55,089

# 4.1 LIVELIHOODS AND CONFLICTS

Although all respondents were agro-pastoralists, the main livelihood and source of income was, reported by 33 (47%) of respondents to be farming, followed closely by agro-pastoralism (n=29).

Figure 6. Main Source of Livelihood



## Crops

Maize and beans were grown by 100% of respondents, with some diversification into other crops.



Figure 7. Crops Grown by Respondents

## **Trends in Livestock and Crop Production**

The majority of respondents reported decreasing numbers of livestock and crop harvest. Only 6 respondents felt that their numbers of livestock was increasing, with 51 perceiving that they had less livestock than 5 years ago. Similarly, 46 respondents (66%) felt that were harvesting less.

Figure 8. Trends in Livestock and Crop Production



# Tendency for Human-Wildlife Conflict

The incidence of conflicts with wildlife, in the forms of crop damage or livestock predation, was perceived to be increasing by 63% (n=44) of respondents.



Figure 9. Tendency for Human-Wildlife Conflict

## Human-Wildlife Conflict

Conflict with wildlife largely manifested itself in crop damage and loss of livestock to wildlife. Nearly all respondents cited these two problems as the main conflicts with wildlife.

Figure 10. Causes of Human-Wildlife Conflicts



## **Problem Animals**

The most commonly cited problematic animals for crop damage was zebra, bush pig buffalo and for attack on livestock was lion, leopard and hyena. 99% of households experienced crop damage and predation of livestock. 22 animal species were responsible for damage zebra, hyena, lion, leopard, bush pig and buffalo accounting for 76.6 % of damage

Figure 11. Wildlife Species responsible for Human Wildlife Conflict



#### **4.2 PROBLEMS TO LIVELIHOOD**

Problems identified by the interview respondents were grouped into 20 categories of problems. These are broadly divided according to the capital assets on which livelihoods depend: natural, physical, financial, human and social (Carney, 1998). Table9. Problem Categories

Asset	Problem	
Туре	Category	Description
Natural	Water	Access to water for domestic use and livestock
	Land	Access to land for agriculture or pasture
	Forest	Access to firewood
	Weather	Droughts and lack of rainfall

	Pests	Destruction of crops and livestock
		Livestock disease and access to animal care
	Livestock	services
Physical	Transport	Road infrastructure and transport
	Agri- Equipment	Access to farming tools and milling machinery
Financial	Agri-Inputs	Availability of fertilisers
	Finance	Access to credit
	Income	Lack of money
Human	Disease	Human diseases
	Hunger	Lack of food
Social	Ceremonial Costs	Costs of traditional cultural ceremonies
	Clothing	Lack of money for clothes
	Health	
	Awareness	Access to education about HIV
	Hospital	Access to health care services
	Housing	Access to modern housing & water tank
	School	Access to school and payment of fees
	Support	Access to agricultural extension

The most frequently identified problem is lack of access to water, accounting for 21% of problems listed. By contrast, conflicts with wildlife accounted for only 1% of problems listed. Problems concerning livestock (13%), lack of access to schools (12%), food (11%) and medical services (11%) present other most frequently identified problems.

Table 10, Problems Identified by Villagers

Asset Type	<b>Problem Category</b>	Arkaria	Lepurko	Mti Moja	Sum
Physical	Water	24	21	21	66
	land	3		2	5
	Forest			3	3
	Weather	3	2	5	10
	Pests		1	2	3

	Livestock	15	16	9	40
Physical	Transport	3	3	1	7
	Agri- Equipment	1	5		6
Financial	Agri-Inputs	1			1
	Finance	2	3	2	7
	Income	4	1		5
Human	Disease	7	7	8	22
	Hunger	13	8	14	35
Social	Ceremonial Costs	1	1		2
	Clothing	1		2	3
	Health Awareness			1	1
	Hospital	14	8	12	34
	Housing	12	6	6	24
	School	10	12	14	36
	Support	3	1	1	5
Total		117	95	103	315

Figure 11. Local Perceptions of Problems to Livelihood



Of the 70 households interviews, 69 (99%) reported crop damage and livestock losses as a cause of human-wildlife conflict, though conflicts with wildlife accounted for only 1% of problems to livelihood. However, the perceived impacts of wildlife conflicts on local people are an important conservation issue, based on the logic that if local people do not attach a positive value to wildlife they will not support its existence (Gillingham & Lee 2003).

# 4.3 BENEFITS FROM WILDLIFE AND THE RELATIONSHIP BETWEEN ROBIN HURT SAFARIS AND THE COMMUNITIES.

#### **Benefits from Wildlife**

60 respondents, 86%, recognised that their village was received benefits from wildlife but a sizeable minority, 10 respondents or 14%, had no recognition benefits derived from wildlife. Nearly all respondents that failed to recognised the benefits from wildlife lived in Arkaria village.

Table 11. Recognition of Benefits of Wildlife

		Mti		
Benefits From Wildlife	Arkaria	Moja	Lepurko	Sum
Recognised Benefits	21	19	20	60
No recognition of benefits	9	1	0	10

#### Local Perceptions of RHS and CHCWP

87% answered positively to questioning about the relationship between the village and Robin Hurt Safaris, depicting a good relationship. 13 of respondents had a negative perception of the relationship between the village and RHS.

Table 12. Perception of Relationship with Robin Hurt

Relationship	Arkaria	Lepurko	Mti Moja	Sum
Positive	23	20	18	61
Negative	7	0	2	9

The principal factors for the perception of a good relationship was due to the

receipt of village benefits, RHS anti poaching activities, the employment of villagers and that RHS was free of corruption.

Reasons for Positive Response	Factors %
Employment of Villagers	16
Anti- Poaching	20
Village Benefits	23
Built Swamp	7
Transport Assistance	5
Making Development	5
Visit Villagers	5
Help with water	5
RHS free of corruption	16

Table 13. Reasons for Positive Relationship

Table 14. Reasons for Negative Relationship

Reasons for Negative Response	Factors %
Prosecution for Killing Problem Animal	11
No Compensation (livestock/crop damage)	11
Low levels of revenues	11
No Communication	7
Overhunting (exceeding quota)	7
Communication only with village chairman	25
Uninformed of number of animals killed in season	4
Lack of Employment	11
Not informed of when hunting in area	11
Not building hospital, water etc.	4

When respondents were asked how the relationship could be improved enhanced anti-poaching co-operation, help with access to water and a village meeting were the most frequent given responses.

Improvement of Relationship	Factors %
Increase Employment of Villagers	10
Help with access to water	14
Enhanced anti- poaching co-operation with RHS	17
Increase village revenues	8
Help with preventing crop damage	2
Increase village employee salaries	1
Build Hospital	7
Build Swamp	2
Build School	4
Build Road	1
Village Meeting to explain benefits/ revenues received	. 9
Working Together for Development	6
Revenues to be paid per animal killed on village land	1
Increase Frequency of CHCWP visits	1
Direct payment of fees to village, not government	1
Joint Ownership of Wildlife: village/RHS	1
Antibiotics for Livestock	1
Informed when hunting in area	2
Informed number of animals killed	3
Train/ equip Village Anti- Poaching Team	4
Compensation for crop destruction/ livestock losses	3

Table 15. Suggestions for Improvement of Relationship

#### 4.4 ATTITUDES TO CONSERVATION

#### **Incentives for Conservation**

When respondents were asked about incentives for conservation, 90% responded that with benefits derived from wildlife, they would like to see the numbers of wildlife increase. In the absence of any economic incentive to conserve wildlife, 63% said they would not like to see wildlife in the area. Encouragingly 29% of respondents responded that even with no benefits, they would like to see the numbers of wildlife increase, demonstrating a positive attitude to conservation. Significantly, 3% of respondents replied that even with tangible benefits being derived from wildlife, they still would not like to see the number of wildlife increase in crop damage and livestock damage.



Figure 12. Attitudes & Incentives for Conservation

#### **Ownership of Wildlife**

The Maasai in Burko desire for the wildlife to belong to them and not the government. 76% (n=53) said that ownership of wildlife should belong to the village. 19% (n=13) were satisfied for ownership to remain with the government and a small number, 6% (n=4) thought that wildlife ownership should be joint between village and government.

# Table 16. Local Ownership of Wildlife

Wildlife ownership	Arkaria	Mti Moja	Lepurko	Sum
Village	23	12	18	53
Government	6	6	1	13
Co-shared Village/Government	1	2	1	4

Figure 13 Local Ownership of Wildlife



#### **5.0 ANALYSIS**

In summary, in the Maasai villages studied, all respondents are agro-pastoralists, with herds of cattle, goats and sheep and growing principally maize and beans. There has been a decline in both their cattle numbers and in their harvests of crops. This problem is exacerbated by further economic losses due to crop damage and livestock losses as a result of an increase in conflicts with wildlife. However, the greatest risk to livelihood perceived by respondents is not conflicts with wildlife, but problems of access to water, education, food and medical services. Most of the respondents recognised the benefits derived from wildlife through the Cullman & Hurt Community Wildlife Project and had a positive view of the relationship between the village and Robin Hurt Safaris. Respondents showed positive attitudes to wildlife and conservation, and a desire to have ownership of the wildlife.

It is the natural capital asset of wildlife that constitutes the community-based conservation through the Cullman & Hurt Community Wildlife Project. As the results above show, problems relating to this resource are not necessarily perceived by all local people as presenting the greatest threat to their livelihoods. The importance of water for development is widely accepted (Orange, 2002) and this study highlights the risk in semi-arid regions where the variable climate means that water availability is spatially and temporally variable. Water was the most frequently mentioned problem.

The development of cultivation and agro-pastoralism in the 1970s, of the Maasai interviewed in this study, corresponds to the time that they stopped their nomadic transhumant lifestyle. The main reason given by respondents as to why they gave up their nomadic existence in turn relate to the Villagisation process in the 1970s. As discussed later, this policy is seen to be the principal cause of the increased poverty of the Maasai and their subsequent strategy of agro-pastoralism, with its consequences of increased human-wildlife conflicts, declining populations of wildlife species and worsening the Maasai pastoralists situation even further.

#### **Benefits and Costs**

The annual average income from livestock per household was estimated at Tsh 732, 469. The annual average loss of livestock income due to wildlife predation per household was estimated at Tsh. 360,333. In contrast, the annual average loss of livestock income due to other causes, typically drought and diseases, per household was Tsh 1,309,473. The annual average income from crop production per household was estimated at Tsh 63, 589. Levels of crop damage were not investigated due to the recognised mismatch between perceived and actual levels of crop damage. However, as an indication of income loss due to crop damage, respondents were asked for their perception of the tendency for conflicts with wildlife, including crop damage. 63% of respondents (n=44) perceived that trend for conflicts were increasing.

The cost of living with wildlife is estimated at Tsh 360, 333 per household, for loss of income due to livestock predation. With an average number of households of 280 per village, the cost of living with wildlife livestock predation to a village is Tsh 100,893,240 or US\$ 91,721 (at an exchange rate of US\$1 to Tsh 1100). With reported increases in the tendency for crop damage, the loss of income due to crop destruction is likely to significantly increase the total cost of living with wildlife. The cost of living with wildlife exceeds the benefits derived from the revenues of trophy hunting. The amount villages received last year was US\$ 697.

In the Burko hunting block during the 2003 hunting season, 64 trophy animals were shot (Robin Hurt Safaris 2004). The total of the trophy fees for the animals came to USD 45, 305, to be paid to the government. A mandatory 20% Community Conservation fee is levied upon clients equally USD 9061 for the Burko hunting block. This is equally divided between the villages equating to only USD 697. One key problem is that due to high population growth, the number of villages has grown from 10 to 13, reducing the amount that each village receives from CHCWP. (see table below). With no family control and large families valued in Maasai culture, population growth and the further creation of villages is likely to continue to be a problem. The average number of

children in the research was 12 children.

Burko Village Benefits				
Hunting	Govt Fee		No. of	Total US\$ per
Season	US\$	CHCWP Fee	Villages	village
2003	45,305	9061	13	697
2002	53,250	10,650	10	1,065
2001	69,750	13,950	10	1,395
2000	61,395	12,279	10	1,228

Table 17. Game Fees and Village Benefits

Even if villagers were given ownership of wildlife and the total trophy fee passed directly to the communities, and all other fees and taxes went to the central government treasury, the revenues received for the last hunting year would have been only US\$45,305. These costs of living with wildlife will still exceed the benefits. Therefore, unless a solution for resolving human-wildlife conflict can be found, the local communities will be economically be better off without wildlife. As the survey above indicates, without an economic incentive to conserve the communities will no longer wish to have resident wildlife present. This could have disastrous consequences for the involvement and cooperation of local people in the monitoring and reporting of poachers. The resolution of human wildlife conflict could be brought about by pastoralist development, discussed in the next section. Pastoralist development and revenues from trophy hunting could remove conflicts and go some way to solving the Maasai's main problems of water and disease of their livestock. The Maasai would be simply better off if could they gave up agriculture, expand their herds and return to a pastoralist existence. The average harvest last year of maize and beans was 9 and 5 bags respectively, and largely for subsistence. The average price of one cow is Tsh. 125, 194. This is enough to buy more than 18 bags of maize and 6 bags of beans, as the average market price was Tsh. 6,750 and Tsh. 19,907 for maize and beans respectively.

There is a growing pattern of land use conflict between agro-pastoralists and wildlife. Joint land use inevitably means conflict between different interest groups. Understanding the sources of income from pastoralism, cultivation and hunting and reasons for change in livelihood strategies, the perceived scale of wildlife- human conflict, perceptions of wildlife benefits and the incentives/ economic aspirations of local people will be a step towards a sustainable strategy of integrating wildlife management with local people's objectives.

#### **6.0 DISCUSSION**

People were most likely to act on problems they themselves recognized, thus, the research provided a logical starting place for community development and conservation work. The study has revealed that the Burko Maasai are faced with a barrage of problems, challenges and few viable options for recreating a sustainable future for themselves.

The problems facing the Maasai are a result of a strong anti-pastoral bias in policy circles, hence lack of policy formulation and development interventions supportive of pastoralism. Tanzania livestock policies reflect official bias against pastoralism and in favour of other economic systems. Development planning in pastoral areas has been based on three assumptions that

- 1. Pastoralists are not contributing adequately to national development
- 2. That they overstock and overgraze and that overstocking is environmentally destructive.
- 3. That pastoral lands could be out to better and more productive economic activity.

This official bias against pastoralism has manifested itself firstly itself in the alienation of lands occupied by pastoralists to other uses, and in the Villagisation programme, introduced in the 1970's with the purpose of bringing services closer to the people. The programme affected many Tanzanians, but the impact among pastoralists was enormous since it suppressed customary rights to resources for pastoral communities.

It is clear that the policy to alienate land and other resources from pastoralists, pursued by the independent Tanzanian government from the 1960s to the present, has undermined Maasai pastoralism and is close to threatening the long term conservation of wildlife. This policy essentially erodes indigenous pastoral institutions and resource management strategies. It poses a serious threat to pastoralism as an economic system and is creating economic vulnerability.

The resource base has been reduced in quality and quantity, reducing resources

that are critical for the survival of herds on which the Maasai depend for their livelihoods. It undermines the transhumant strategies and the viability of the pastoral economy making pastoralists. Households find it increasingly difficult to withstand shocks, such as drought and disease and are their livelihoods have become insecure. Since, livestock are forced to concentrate on small marginal areas that used to be utilised only seasonally, environmental stress is experienced, while the numbers of livestock that can be kept per household have been reduced. This results in the decrease in the productivity of the pastoral economy. Since livestock are the productive assets of pastoralists, their decrease in numbers also implies increased levels of vulnerability, food insecurity and structural poverty.

One of the most significant consequences of Tanzania's problem wildlife policy is the increased adoption of agriculture. The arid and semi-arid areas to which pastoralists have been pushed, are not ecologically suitable for continuous cultivation, and in the long run contributes to the weakening of the livestock economy, increases environmental destruction and it also increases conflicts with wildlife. Increased human-wildlife conflicts are likely to lead to the loss of incentive for conservation of wildlife. Borner (1985) sees the progressive conversion of Maasai rangelands to large scale farming, permanent subsistence cultivation and settlement, as well as formal ranching, as rapidly blocking off vital wet season dispersal and migration routes. Savanna conservation areas in East Africa are dependent on the sort of buffer zone provided by Maasai pastoralist rangeland, which allows long-term coexistence of wildlife and livestock. The presence of unfenced, unimproved and uncultivated joint land use rangelands effectively increases the total area and range of resources available to wildlife in associated conservation areas. This enhances their long-term survival as predicted on the basis island biogeography theory (Western and Ssemakula 1981). Agropastoralist development could be a deathblow to major wildlife concentrations. To stem, and possibly reverse, the rise of agro-pastoralism, any long-term conservation strategy will have to address the issues of insecurity of resource tenure, pastoralist development and reform of the national wildlife policies.

# 6.1 WILDLIFE CONSERVATION AND PASTORALIST DEVELOPMENT

Conflicts with wildlife features are a most serious threat facing pastoralists. Human- wildlife conflicts emanate from conflicting land use practices between pastoralism and agriculture, pastoralism and wildlife conservation. The incidence and intensity of conflicts has increased due to the alienation of key pastoral resources such as land and water. It has reduced mobility of herds, and in doing so; it has destroyed mechanism that has previously been effective in coping with ecological vicissitudes. As a result, an increasing number of people are being forced out of pastoralism into agro-pastoralism, leading to conflicts that will undermine a sustainable conservation strategy.

#### **Conservation and Development**

Often, conservation and development seem to represent diametrically opposed aims, so that management will be at best a compromise and at worst a destructive conflict between the two. Fortunately, wildlife conservation and pastoralist development are mutually compatible. Increasingly, the assistance and development organisations of the world are waking up to these realities (Dixon et al. 1992). Economic developments are no longer encouraged in defiance of ecological limits but rather is planned to complement and perhaps expand such limits (Kiss 1990, Lindberg 1991, Wells et al. 1992).

The last few years have seen a radical rethinking of the development process in Africa as a whole (Sandford 1983, Cross 1985, Timberlake 1988). There is a growing understanding of many traditional forms of wildlife use (McNeely and Pitt 1985, Bell 1987), cultivation and stock rearing (e.g. Ellis and Swift 1988, Cross 1985, Mackenzie D. 1987, Timberlake 1988). At the same time there is a fundamental reappraisal of conservation aims and methods, particularly as regards the role of local communities (McNeely and Pitt 1985, Bell 1987, Western 1984). The conservation-oriented exclusion of human populations from

ecosystems of high conservation value, with which those populations have a long-standing and close integration, is now recognised as artificial and inappropriate in biological terms. Local and indigenous peoples often have extensive knowledge about wildlife, developed through a long history of coexistence and use of these resources. Yet, their knowledge has tended to be overlooked by conservation and wildlife professionals whose perspective reflects a foreign set of values, assumptions, and experiences regarding human/wildlife relationships (Cleaver et al. 1992). The rights of local communities, both economic and in terms of quality of life and cultural values, are now taken more seriously (Bodley 1988, Goodland 1985). This enlightened attitude is reinforced by the fact that the long-term political viability of conservation schemes is strongly dependent on enlisting and reinforcing rather than denying the cultural values local communities attach to those natural resources.

Where wildlife is in trouble, the usual reaction within the conservation community is to judge continued use of those resources- as "wrong"- as a destructive practice that must cease in view of dwindling populations (Lindberg 1991, Wells et al. 1992). Such judgements may prove short sighted, however, if they fail to view problems of failing wildlife populations in proper cultural, economic, and ecological perspective. The real challenge is to restore the balance of wildlife resources and human need so that long and successful traditions of coexistence can be continued or re-established.

As in argued in the next section, land use patterns, and the state of vegetation and wildlife populations show that pastoralism and wildlife conservation work well together. Both rely on the maintenance of similar rangeland conditions, and particularly on the exclusion of large-scale cultivation. Pastoral development is no threat to conservation. The long term survival of wildlife conservation is actually dependent on coexistence with Maasai pastoralism. Their respect for wildlife, which can sour where conservation interests are pursued to their serious detriment, survives a transition to a more nationally integrated, market-oriented economy (Western 1984).

#### Joint Wildlife/Pastoralist land use systems

Joint wildlife/pastoralist grazing systems can be broadly categorised as those which are predominantly managed for wildlife, those where wildlife and pastoralist interests have more or less equal weight, and open areas where wildlife is secondary to human interests.

In Tanzania Maasailand it is the normal pattern that wildlife coexist alongside Maasailand livestock. In particular, there is common dependence of conservation areas on adjacent Maasai rangeland as dispersal areas for wildlife is clear. The 570km<sup>2</sup> Simanjiro plain in Northern Tanzania is a part of the wet season dispersal season wildlife area for the 2600km<sup>2</sup> Tarangire National Park. The Tarangire/ Simanjiro areas make up a grazing system comparable to that of Amboseli. Maasai domestic stick make up 60% of the 8500 kg/km<sup>2</sup> grazer biomass in Simanjiro in the wet season; the remainder is composed of seasonally mobile wildebeest and zebra (Kahurananga 1981, using 1970-1972 census figure). Thus, wildlife conservation areas throughout Maasailand are dependent on Maasai pastoralist rangelands as buffer zones for the survival of migratory or seasonally dispersing wildlife populations. Maasai rangelands that operate as open areas, with human interests predominating and without formal protection of wildlife populations, retain comparatively high wildlife: livestock biomass rations, showing the compatibility of wildlife conservation and pastoralism. Many East African conservation areas are continuous with Maasai rangelands. Such rangelands are invaluable buffer zones. By comparison, creeping agropastoralism with is concentration on water sources rapidly eliminates wildlife.

However, the prevailing view was Maasai pastoralism is a primitive and inefficient form of land use (Malpas and Perkin 1986, Kitomari 1986). Pastoralism is a legitimate and viable form of land use relative to wildlife conservation and tourism. This section looks at the efficiency and productivity of Maasai pastoralism in the context of the available resources and prevailing constraints. The comparison of migratory wildlife and pastoralist stock emphasises the divergence between subsistence pastoralism and commercial livestock production, which is often seen as the natural development alternative (Barnes 1979, Ole Saibull 1978, Simpson 1984b). Subsistence pastoralists at the arid end of the spectrum pursue an opportunistic strategy suited to an unpredictable, fluctuating environment (Dyson-Hudson 1980) in which a combination of risk avoidance and tracking resources may be more productive for pastoralists than any attempt to maintain stable production levels (Sandford 1982). Pastoralist herds show maximum potential for rapid increase, high mobility, efficient colonisation of temporarily utilisable areas followed by resource exhaustion and renewed dispersal. By contrast, the development alternative is of controlled production and high proportional offtake of high quality individuals from smaller populations, limited mobility and flexibility, with numbers (both human and stock) kept to a steady level corresponding with maximum reliable financial yield. It is not clear how sustainable and efficient this strategy may be in unpredictable arid and semi-arid areas (Sandford 1982) but there is no doubt that in such areas it would require technological investment and fiscal change not currently feasible in many sub-Saharan rangelands. Caughley, Shepherd and Short (1987) dismiss the possibility of sustained yield cropping in the highly variable arid and semi-arid systems of Australia and stress the need for flexible management. It is increasingly clear that pastoralist systems are more productive than western style ranches in similar environments in terms of energy, protein or money equivalent per unit of land (e.g. Grandin 1988).

The management strategies of a commercial beef rancher or dairy farmer, to gain maximum growth rate or milk yield per individual cow, is in contrast to the subsistence pastoralist seeking stocking rates, animal breeds and management strategies which allow the maintenance and long term survival of a herd (and the long term subsistence of a large number of people). When all the inputs and outputs are taken into account, rather than the yield of a single product per animal, the subsistence systems are as or more efficient than commercial ranches (Behnke 1985; Cossins 1985; Grandin 1988; Sandford 1983: 123-127; Jahnke 1982). De Leeuw, Bekure and Grandin (1988) compare production indices per

unit land for a Maasai pastoralist system and a commercial beef ranch. Livestock outputs and gross cash incomes were similar but the Maasai system had costs less than one-tenth those of the commercial system. The aims and techniques of subsistence pastoralism differ from those of commercial livestock production and have in many cases been shown to be ecologically better suited to the suited special conditions of arid and semi-arid Africa.

Any lasting development in the pastoralist system is likely to be towards a more secure subsistence rather than towards intensive commercial production. Technical inputs could make a useful contribution that is also compatible with conservation. Development interventions might make Maasai pastoralist subsistence more viable within the constraints of conservation requirements and policies. There are aspects of development that are compatible with conservation.

#### Water Development.

Water development is seen as a top priority by most Maasai. Most Maasai saw wildlife conflicts as secondary to their main problems of access to water. All villages considered current water supplies to be inadequate. With considerable population increases, and many settlements from permanent water, there is a widely felt need for new or rehabilitated water supplies. Sandford (1983) stresses the importance of taking advice from the local pastoralists on such matters. Their wealth of experience and management information on the topic compensates for the lack of long-term survey and monitoring data and improves the chance of designing appropriate inputs based on short term surveys in a highly variable environment. Water developments will suffer from lack of consultation with local pastoralist over such issues. Cobb (1989) stresses the need for consultation with the Maasai over water development in general.

Water development must ensure separation of domestic water source from those for livestock and wildlife. Any water delivery points must be designed in the light of past experience to avoid damage or pollution by livestock, wildlife or people. Domestic water pints must deliver water of acceptable quality, both bacteriological and chemical, particularly with respect to the salinity and fluoride content. Development must take into account that demand increases with supply, and that domestic demand increases with the changing lifestyles brought about by development.

#### **Veterinary Services**

Although access to quality grazing and reliable water supplies are serious constraints to livestock production, one of the most important problems is that of disease. In Burko, among the 70 respondents, the deaths of 985 cattle due to reasons other than predation from wildlife losses were largely attributed to this loss of control over disease transmission. This is because the Maasai lack immediate access to a primary animal health service or a reliable supply of good quality medicines. There needs to be support to Maasai pastoralist in the delivery
of veterinary services.

Control of livestock diseases is necessary to the point where it would become possible to think in terms of breed improvement will further improve the living standard of the population. Tick control is a major management issue. Ticks in very high numbers cause anaemia and predispose wild animals to disease (Sinclair 1977). Surveys of perceived problems showed many Maasai villages listing disease (usually ECF) as one of their major problems (Arhem 1981a,b; Chamshama, Kerkhof and Singunda 1989:14). The breakdown of tick control seems to have been a major factor in the high mortality and overall decline of the cattle population 1980-84 in NCA (Rodgers and Homewood 1986).

The policy of the Tanzanian government has, since some time already, been to privatise such the delivery of veterinary services (Ministry of Foreign Affairs 1996). The 1997 Agricultural and Livestock Policy stated that, "Farm level disease control is the responsibility of the livestock keeper and he/she should buy the service".

Livestock services have declined due to Government withdrawal resulting in a service vacuum for private good services. This has been partially filled by a variety of serive providers including livestock sector civil servants, 'licensed' drug vendors, illegal vendors and briefcase salesmen many of whom are known to be trading in fake, expired or adulterated veterinary products ((Department of Water & Livestock Development 2003). The result has been a gradual increase in the incidence of livestock diseases and a concurrent reduction in livestock production.

According to the Department of Water & Livestock Development (2003), a recent survey undertaken in Mwabulenga village, Magu District, revealed that thee annual average annual loss by livestock owning families due to the effects of livestock disease amount to TSH. 66,000. This implies an annual loss in excess of Tsh 100,000 million to the rural livestock sector in Tanzania every year.

It is clear that the Maasai are in no position to buy veterinary services. Development intervention is needed for the delivery of animal health services, to give the Maasai access to primary clinical services and animal health workers. To contribute to pastoral development and the reduction of poverty in rural areas, through improvements in livestock health and production, livestock keepers need to obtain access to services including disease prevention e.g. tick control; and clinical services e.g. diagnosis and treatment of commonly occurring livestock diseases.

### **6.2 INSECURITY OF RESOURCE TENURE**

Alienation of key pastoral resources such as land and water are the most serious threat to Maasai pastoralism and to pastoral livelihoods. The loss of these areas has resulted in the reduction of the resource base with serious noticeable consequences. It is recommended that traditional pastoral communities like those of the Maasai should be allocated specific areas for rotational grazing to allow livestock raising. This will entail a change in the existing property regime and land tenure policy to allow for communal property ownership and institution of grazing control measures

# **Property Regime**

While pastoralism and wildlife are the most compatible land use systems, (as opposed to pastoralism/ agriculture or wildlife/agriculture), the imposition of administrative mechanisms governing wildlife conservation and management have imposed exclusive models of property rights, which removes the complementarity which existed between the two prior to the Ujaama policy of the 1970s and the creation of national parks and conservation areas. This serves to heighten the wildlife-pastoralism conflicts and these conflicts have now reached unsustainable levels. It is necessary for a policy commitment to pastoralist development and allow access to an enlarged and better-managed grazing area. It will thus be possible for some pastoralists to return to rotational grazing, shifting between their highland ranges and the plains. The Maasai are capable of maintaining large flocks and herds on arid or semiarid lands; land with persistent vegetation cover favours ticks, flies and worms. Because overstocking tends to produce aridity and to reduce the incidence of parasitic diseases, native stockowners favour it. They prefer seasonal losses from starvation, which they can understand, to continual and greater losses from disease, the nature of which is beyond their comprehension. It is recommended that truly pastoral villages that live nomadic or semi nomadic lives should be allocated specific areas that are suitable for livestock raising. They should then be allowed to practice rotational in those areas instead of using unsystematic ways of moving their animals in search of pasture and water. This will involve evacuating land around watering points during the whole of the growing season. People would move to allocated tsetse-free land which has no stock and go back to the watering points during the dry season. This will mean instituting grazing control measures by government. The government should also provide wellplanned watering points and veterinary services.

The most important principle of such a scheme is the complete resting of more than half the grazing land during the entire growing season. In compliance with the demands of the scheme, alien squatters should not be allowed to cultivate near permanent water in fly-free areas. They should move their stock out of the area except for a few milking cows if required.

According to Murphree, 'people seek to manage the environment when the benefits of management are perceived to exceed its costs'. This is an important proposition since it introduces the issue of cost, which is a fundamental dimension of environmental management. The benefits they perceive may be short or long term. But they will only manage the environment if they consider the benefit to be worth the cost and if they have the means to meets these costs.

The ideal property regime for Maasai pastoralists is when natural resources/wildlife are held here under a communal property regime, 'use rights for the resource are controlled by an identifiable group and are not privately owned or managed by governments: there exist rules concerning who may use the resource, who is excluded from the resource and how the resource should be

used' (Berkes and Farvar, 1988: 10). Thus it is a management regime, with rules on access to or exclusion from proprietorship of natural resources The weakness of the Tanzanian state natural resource management regime is that it is under funded, large scale and managerially distanced from the resources in question. In such circumstances the state purports to be the manager but de facto use and management are in the hands of others- the people living with the resources concerned. Not only is local resource management resource marginalized, it is also antagonised. Bromley and Cernea comment, "Unfortunately most state property regimes are examples of the state's reach exceeding its grasp'. Many states have taken on far more resource management authority than they can be expected to carry out effectively. More critically it sets the government against the peasant when, in fact, successful resource management requires the opposite' (Bromley and Cernea, 1989: 25).

One of the central tragedies in the history of African and natural resource management is that the debate on tenure has largely been restricted to a discussion of the relative merit of state or private property regimes. Policy has assumes two options, privatise or nationalise, ignoring the further option of a communal property regime.

In Zimbabwe, for instance, by 1961 approximately 50% of the total land surface had been alienated into private hands. The rest was state land- parks, wildlife and forestry lands or communal lands (37%). In these communal lands, where over 60% of the population live, a system of 'indirect rule' was in place and traditional leadership structures were supposed to play a role in land and resource management. But the ability of these traditional structures had been seriously eroded by their tenure status. This mirrors the situation in Tanzania. The local people are on state land with usufructural rights only; they had no powers of exclusion and access to certain natural resources (e.g. wildlife) are denied to them. Thus the conditions for a genuine communal property regime are removed. Under these conditions, and with the state effectively unable to manage resource, resource use tends to acquire the characteristics of an 'open access' system. It is not surprising therefore that the communal lands have been the scene of some of the greatest environmental degradation in the country.

State management will not viably address those areas where most of the rural population lives and which are under the greatest environmental pressure. A focus on the two policy options ignores the potential for cost-effective collective local management enforced by informed by informal social pressure and drawing on detailed local knowledge of ecological dynamics. Unless policy tenure and natural resource management seriously considers the third option of communally based resource management regimes. There is little reason, either from the historical record or from an analysis of the factors and dynamics involved, to be optimistic about the future of the environment.

What is required is the establishment of communal property regimes by defined groups in defined areas and with rights of inclusion and exclusion. Such groups should have proprietorship of the natural resources concerned. 'Proprietorship' means a sanctioned use-right, including the right to decide whether to use the resources at all, the right to determine the mode and extent of their use, and the right to benefit fully from their exploitation in the way they chose.

The delegation of proprietorship over natural resources to communities involves the relinquishment of considerable authority and responsibility on the part of the state, although such relinquishment is never total any more than the privatisation of land holdings implies a total withdrawal of state authority. Relinquishment of authority runs however contrary to the bureaucratic impulse to retain authority centrally and the establishment of communal natural resource management regimes will require strong policy directives to overcome this tendency.

The government (through the Wildlife Department) remains the controlling authority for wildlife in communal lands, policy being that revenues accrued by government from safari hunting in communal lands were to be returned to district councils for community projects in producer areas through an extended chain of bureaucratic procedures. This in the long term will result in an almost total failure to receive community support for wildlife-related activities. Procedural complexity and bureaucratic inertia results in a situation where only a portion of revenues generated was returned to producer districts and far less of this was

returned to producer communities.

### **Communal Resource Management Regimes**

For most of the rural populations of Africa the communal context is the context of life and will be so for the foreseeable future. People live on state land, not private land, and in conditions where the state is incapable of sustainable resource management and local inhabitants have neither the motivation nor the authority to sustainable manage resource themselves the mischief arises from a fundamental misconception that equates the communal context with the communal property regime. The communal contexts are not communal property regimes, since they have been stripped of the necessary entitlements required. The evidence is that communities can become effective institutions for sustainable resource management, but only if they are granted genuine proprietorship, that is, the right to use resources, determine the mode of usage, benefit fully from their use, determine the distribution of such benefits and determine rules of access. Any policy that excludes these components will frustrate the goal of making communities effective institutions for resource management.

### **Resource Management and Resource Use**

Resource use without resource management is non-sustainable. People seek to manage the environment when the benefits of management are perceived to exceed its costs. In modern rural Africa, even in its remotest area, benefit is most often seen in the people's thought as revenue, cash income convertible into the various goods and services that communities and individuals want or need. Benefits is of course not only this, but much development thinking seems to assume that what rural peoples need and want is restricted to subsistence maintenance. 'Development means money' is a more definite accurate description of rural African perceptions of development. Not only does it properly reflect the pervasive reach of the "cash economy", it also puts benefit in the form of revenue which can be flexibly used according to people's own priorities, and which forces them to build their own institutions of fiscal management which articulate within the larger economies of which they are a part.

There is a strategic lesson to this. If we are concerned to promote communally based environmental management, chances of success are enhanced when a common property resource of high financial value is available and project focus is initially on the sustainable exploitation of that resource. In Zimbabwe this resource has been wildlife, a resource has been wildlife, a resource of high and escalating value, exploitable in environmentally benign ways and requiring relatively low capital inputs. As Child puts it, "Real and immediate benefits, graphically illustrated by cash, cement the relationship between wildlife and economic development. These incentives are crucial to encourage communities to cultivate their wildlife resources" (Child and Peterson, 1991: 41). Initial and dramatic results in revenue generation of this kind then have an incremental effect on the quality of the community's management of other, less lucrative, natural resources. If people receive revenue from wildlife, they will also start to manage their woodland and their soils. Ecological holism is not a new concept for rural African peoples; it is simply a concept that their concepts have not allowed them to apply. The crucial links between ecology and politics, between environment and development, stand a better chance of being incorporated into policies that work.

# 6.3 COMMUNITY DEVELOPMENT LINKED TO TROPHY HUNTING

Community-based conservation can achieve the dual goal of community benefit and wildlife conservation. Pastoralist development is mutually inclusive of integrated and sustainable rural development through community/private sector joint ventures linked to trophy hunting. Trophy hunting channels funds through joint ventures into rural areas for development. It provides a link between conservation and rural development.

Whereas the Maasai bear the brunt of wildlife presence in their areas (crop

damage, livestock losses), benefits generated from wildlife resources through tourism are utilised by the central government and by outsiders. Although collected locally, the revenue is used nationally and local communities do not benefit, and conflicts persist. By changing economic perceptions of the value of the wildlife to the Maasai, tourism can change policies of land use which themselves radically affect pastoralist and wildlife The possibilities for development of trophy hunting and its compatibility with conservation are discussed.

The Cullman & Hurt Community Wildlife Project could be improved by a very decentralised system with Government setting the rules and the private sector and rural communities working in long-term joint ventures to manage, develop and market wildlife in their areas. It must be effective in assuring revenues accrue to the lowest common denominator, the village. This is needed if people's attitudes towards wildlife are to change. Any model system for trophy hunting revenue collection and allocation must address the following themes.

### The Sustainability of trophy hunting

Consumptive uses of wildlife, of course, are not necessarily sustainable However, trophy hunters are after only a very small percentage of the male segment of the population, and by definition, the take is small and select (Morrill 1993). Professional hunter Robin Hurt has said that he intentionally seeks out for his clients, very old males which have been ejected or separated from their herd and are no longer reproductive (Baker 1997).

According to Whitman (2004), sport hunting of male trophy animals can only reduce overall population size when the rate of removal of males is so high that females can no longer be impregnated. In the case of African lions, sustainable trophy hunting requires simply hunting males above a minimum age threshold, and this strategy maximises both the quality and quantity of the long-term kill.

Commercial poaching and inadequately regulated foreign and resident trophy hunting sanctioned by the Wildlife Department have adversely affected wildlife populations inside and outside Tanzania national parks to a greater extent than subsistence hunting" (Shaun 1999). Inadequately regulated trophy hunting can be avoided by the policy changes described below.

#### Sustainable Quota Systems and Wildlife Monitoring

"One of the fundamental requirements of consumptive utilisation is a well thought out and scientifically based system of quota setting" Nshaka, R. (1999). Until present, quotas are set by educated guesswork and there is an urgent need to determine the sustainability of the quota (Caro et al. 1998). Any country should have a system that mandates how many animals should be hunted in a particular area (Overton: 22). In addition, the system should be able to show what animals should not be hunted - for reasons such as low population, immaturity, pregnancy, or protection under national law and international treaties like CITES.

In Tanzania, however, the actual situation does not match up to these requirements. This is because the country has no overall trophy monitoring system capable of providing the Wildlife Division with reliable information. As a result, quota setting is based solely on anecdotal reports from game officers in the field and hunting companies. In some instances, quotas have been issued that exceed the population of animals in a particular hunting block (Nshaka 1999).

The annual quotas of proposed takings need to be sustainable, i.e. they will not affect the long-term survival of the species. Quotas need to be based on reliable population estimates. Wildlife monitoring is necessary to assure accountability and sustainability of wildlife through trophy hunting as a viable economic resource for Robin Hurt Safaris and the local communities. It is also to assure a viable, vigororous and efficient safari industry. Monitoring helps assure that goals are being achieved. If they are not then adjustments in trophy quality can be made.

Trophy quality monitoring is recognised as an essential tool in sustainable wildlife management. Trophy quality is an indication of a healthy population

both economically and ecologically. A consistent decline in trophy quality can trigger a threshold of potential concern (TPC), which can act as a stimulus to mobilise further in-depth regional species-based studies (Safari Club International). Hunting is best regulated using the principle of adaptive management. This requires an evaluation of wildlife resources in order to set annual quotas for each species in a specific area. The quality of the trophies hunted in a specific area should be recorded and data entered into a database to refine the annual quotas of certain area. If the quality of trophies taken from an area declines or the time taken to hunt an acceptable trophy requires an increase then the off-take is probably too high and the quota would need to be decreased. If the trophy quality remains stable or increases the quota would remain the same or be increased respectively.

In 2004, the Tanzania Wildlife Research Institute (TAWAIRI) implemented a project on carnivore monitoring which aims at collection information on all the carnivore species to determine their distribution patterns. The project is working very closely with stakeholders in the tourism industry who assist with collection of this information. Such projects are to be encouraged and developed as such information is important in understanding whether ranges for carnivore species are expanding or contracting, but also assessing threats and the effectiveness of conservation action, as well as the setting of quotas.

#### **Decentralisation of quota Setting**

Devolution of the responsibility of managing wildlife and quotas should be decentralised down to the Rural District Councils. The District Council, safari operator and rural communities come together to discuss wildlife monitoring data. This includes a hunt return form provided by the safari operator, and qualitative/ quantitative observations on wildlife populations by the safari operator and rural communities, and trophy quality. Based upon this information the group recommends a trophy quota for the concession to Government.

### Decentralisation of allocation of hunting block

In order to improve the management of local resources, where hunting blocks are located within village lands, the local communities should be involved in any decision regarding the exploitation of wildlife resources in their area. At the same time a legal agreement is drawn up between a potential investor and the village authorities to ensure that the rights of the local communities are protected and respected. (Institute of Resource assessment 1999)

### **Extension of Hunting Leases**

There is a need to leases extended from the current 5 years to at least 15 year leases, and possibly 30 years leases. This is so that hunting operators have an incentive in the long-term to respect wildlife/habitat management and community relations. Longer term agreements increase the private sectors' willingness to invest in an area, especially for infrastructure and support to local communities e.g. long term wildlife/ trophy quality management, and in community relations/ rural development schemes.

The lengthening of leases will also be a highly positive action for conservation. The long term economic sustainability of hunting operators is dependent on the sustainability of trophy species. In the case of lions, Whitman et al. (2004), hunters need to follow a long term approach to the selection of age minimum trophy males to maintain viable population for hunting.

# Wildlife and Property Rights

Communal lands have even greater potential than commercial lands for wildlife utilisation. The property regime in Maasai rangelands is effectively that of open access. The most efficient, sustainable use of wildlife is determined in part by who owns the resource. The wildlife resources of Tanzania belong to the government irrespective of whether they are on public or private land. There management is entrusted to the Wildlife Division of the Ministry of Natural Resources. From a sustainability point of view, open access is the least desirable scenario since unlimited, unrestricted access promotes an inefficient allocation and destroys any incentive to conserve. (Baker 1996). Projects are trying to

devolve responsibility for controlled wildlife exploitation (as well as for wildlife conservation) to local communities (Martin 1986, Abel and Blaikie 1986). An IUCN study of East African antelopes suggest this sort of wildlife exploitation should become more general as part of an integrated and long term conservation approach (East 1988).

The government of Tanzania needs to adopt a new Wildlife Policy intended to better address the problems facing wildlife management, relinquishing state ownership and control of wildlife resources. Fortunately, though the policy is not clear, it is moving towards establishing Wildlife Management Areas (WMAs) (Shaun 1999). The draft Wildlife Policy calls for the creation of wildlife management areas (WMAs), which give local communities some control over wildlife resources on their lands and enable them to benefit directly from these resources. Rural communities are allowed to establish WMAs, defined in the policy as "an area declared by the Minister to be so and set aside by village governments for the purpose of biological natural resource conservation" (MNRT, 1998:34). In turn, communities may lease trophy hunting or game viewing concessions to tourist outfitters or themselves engage in hunting for food.

As has been documented, the current policy also does not adequately recognize the transhumantic, or nomadic, nature of many communities living within or near wildlife areas and Tanzania's protected estate. Pastoralism in semi-arid environments requires regular movement and flexibility in order to utilize the different climate-driven resource niches (Potkanski, 1997; Lane, 1995). Regrettably, the concepts of 'domain and territory' (Kaare, 1996), which inform pastoral land use and resource tenure, do not coincide with the sedentary, villagecentered thinking that informs the WMA concept.

To accommodate nomadic communities successfully, the policy must give legal recognition to traditional social and political organizations by granting them Authorized Association status under the Wildlife Conservation Act of 1974. The Act empowers the Director of Wildlife to grant hunting concessions and other wildlife user rights to villages by declaring them Authorized Associations. The

policy could lessen procedural requirements by allowing these communities to submit verbal or simple written plans on how they wish to use natural resources to benefit the entire community and how they plan to ensure that the resources and environments are managed well.

### Model System

A national model system of community development should maximise community benefits and the sustainable use of wildlife resources. The hunting revenue and allocation system in Tanzania is the worst of six Eastern and Southern countries profiled in Baker 1997. There is no evident relationship between the number and type of animals harvested in a village and the amount of money it receives. A sustainable strategy of integrating wildlife management with pastoralist development is preferable, and pastoralism/wildlife for trophy hunting should be the alternative land use to agro-pastoralism outside protected national parks and reserves.

The optimum method of encouraging local communities to use their wildlife resources, based on the principles-based conservation, is to establish a direct connection between each animal and its benefit to the community (Thomas 1994). Indirect or partial receipt of benefits would obscure or diminish the true value of the natural resource and would alter the cost/benefit equation, perhaps leading to the conclusion that wildlife management is not in the best community interest. Further, currently the amount of local revenue received from the hunting industry is negligible as funds passing through the central Treasury and are not passed on to the local level. Under centralised revenue collection and disbursement systems, local residents have less incentive to manage and supervise off –takes, since their level of benefits is not clearly linked to those off-takes. (Baker 1997).

Trophy fees should be the most desirable revenue source, since they clearly assign a value to an animal. License fees and taxes are less directly related to the resource (assuming the fees are the same regardless of the number of animals killed). The level of community benefit is not dependent on the level of off-takes.

Collection of trophy fees at the local level is preferable to a centralised revenue collection system. A single fund administered far away from the resource is susceptible to leakages, reducing community benefits and obscuring the wildlife-benefit connection. An optimal hunting revenue collection and disbursement system would pay concession fees to the Wildlife department/ Treasury and trophy fees to the local communities. This system and the devolving of government control to local communities should be applied to communal lands.



Figure 9 An optimal hunting revenue collection and disbursement system

Figure 14. An optimal hunting revenue collection and disbursement system. Source:Baker 1997

Money from hunting will be given directly to the community. The more the money goes down to the local level, which is the village, the greater the likelihood it is to have a favourable impact on development and in changing attitudes towards supporting wildlife and conservation principles. It is believed that directly linking the safari operator/PH to money from trophy hunting helps t engender a business like relationship between the safari industry and the community and helps them to better understand the link to wildlife and the future well-being of their families. Wildlife is the best and use and local people must see its benefits in order to be encouraged to maintain these natural systems.

Sharing economic benefits with local people, and involving them in the decision making process with regard to wildlife, its management and development, will help to change their attitudes towards wildlife from one of a pest to an important sustainable economic resource.

# Lessons for the future

Countless papers in the literature of wildlife conservation describe people as "the problem" behind wildlife's demise (Ledec and Goodland 1988, Kiss 1990, Wells et al. 1992). This view sees local people as obstacles in the way of scientific management and recovery of wildlife populations. Increasingly, however, local people are recognised not as the problem but as vital parts of the solution. Indeed, without including local people, no solution is possible.

Any objective going forward objective is to mitigate the conflict between the local people and the wildlife project, facilitate the active participation and the empowerment of the Maasai and their community, and to establish an integrated conservation program for the area. An integrated conservation program has 6 components (Tambiah):

- 1. The simultaneous management of diverse wildlife and other natural resources.
- 2. An interdisciplinary approach that addresses and incorporates the biological, political, economic and cultural aspects of a resource.
- 3. The active participation of parties, especially local communities.
- 4. Ecologically and culturally sound management strategies.
- 5. Rural development as part of wildlife management, such that the local communities closest to the resources receive the greatest economic and social benefits.
- 6. Training and education of parties in wildlife research, management, and conservation, within the context of rural development.

Wildlife cannot be separated from the needs and involvement of rural people, or from ambient cultural, political, economic, and biological realities. The proposed integrated conservation program is an example of an alternative that sustains wildlife and human communities.

# 7. SUMMARY AND CONCLUSIONS

The reduction of conflicts and the increased conservation of wildlife is dependent on pastoral development policy and reform of the wildlife management policies. Trophy hunting and wildlife is the most compatible land use system to pastoralism. The issues of pastoralist development, resource tenure and wildlife management are interdependent on each other, and has been demonstrated that a sustainable solution requires all three. The solution needs to focus first on poverty reduction. Policy interventions should be concerned with the threats of insecurity of pastoral livelihoods. The underlying causes of these threats need to address so as to curb further destitution of pastoralists and avail them with them a livelihood. For the policy (and pastoral development initiatives emanating from it) to protect and promote entitlements of pastoralists, its formulation needs to reflect on the following issue.

Current resource use in Maasailand is not sustainable. At present rate of population growth, both human and non-human inhabitants of the area face a severe threat to their existence. The primary management objective in this area should be to ensure the long-term maintenance of livelihood of the local people. The immediate measure needed to achieve this objective is to correct the inadequacies of existing land tenure policy to allow for communal property ownership in Tanzania. It is encouraging that some laws are being reviews and rationalised, including the Villagisation Act, 1975; Range Development and Management Act, 1964; Land Use Commission Act, 1984; and the Grazing Ordinance Cap. 155 (Masaki, 1992). Traditional pastoral practices are capable of effective regulation of land use when blended with modern techniques, and may lead to development of sustainable pastoral systems and conservation of biodiversity.

Although traditional land husbandry systems are now believed to be sustainable (Repetto and Holmes, 1983; Eden, 1987), they are not being assisted or given the opportunity to evolve to higher technological levels. They are instead an impoverished and neglected sector. Efforts should be made to study traditional management systems and improve upon them to ensure their effectiveness.

It is particularly notable that in East Africa the vast majority of natural resources are artesian. But despite the role played by these smallholders in the economy of the region, development policies, especially in Tanzania, have mainly focused on macro-economic issues, which are expressed in monetary context. Smallholders are left to over-exploit the dwindling natural resources. There is a need to refocus development practices in order to benefit the right targets: the grass roots. Despite the potential of semi-arid areas to contribute to the national economy, no proper systems for resource management have been developed. Management systems have instead been borrowed wholesale from other regions of the world. If these are not appropriate to local conditions, environmental degradation and loss of biodiversity can result. There is a need for a concerted search for policies and strategies, which take into account innovative approaches to natural resource conservation and development. Biodiversity can be sustained and enhanced by encouraging the regeneration of traditional indigenous systems. To make these traditional systems work, there is need for on-farm research into pastoral range/livestock production systems as well as rangeland research and extension services. Research should concentrate on smallholder systems and community needs.

Thus, it seems that some form of nomadic pastoralism beside community wildlife management remains the best way of utilising semi-arid and arid rangelands.

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