ECOTOURISM AND ITS EFFECTS ON THE LIVELIHOODS OF THE HOST COMMUNITY AND NATURAL RESOURCE MANAGEMENT: A CASE STUDY OF AMBOSELI, KENYA I)

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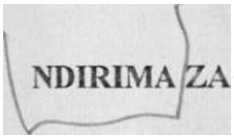
NDIRIMA ZACCHAEUS KINUTHIA
(B.Sc. Range Management (Hons, U.o.N))

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN RANGE MANAGEMENT, FACULTY OF AGRICULTURE, UNIVERSITY OF NAIROBI

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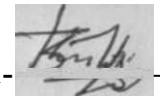
DECLARATION

This thesis is my original work and has not been presented for an award of a degree in any other university

Signed-  **— V ^ M S L S I**

Ndirima Zacchaeus Kinuthia

This thesis has been submitted with our approval as university supervisors

Signed--^- Date

Dr. Njoka Jesse Theuri

Department of Range Management

Dr. Nyariki Dickson Mong'are

Department of Range Management

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DEDICATION

This work is dedicated to my late mother, Eunice Wangui Ndirima, who never lived to see the completion of the study.

God bless her soul.

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ACRONYMS

K.WS- Kenya Wildlife Service

IPCC- Intercontinental panel on Climate Change

ACC- African Conservation Centre

MAB- Man And Biosphere of the United Nations Education, scientific and Cultural Organisation

FAO- Food and Agriculture Organisation of the United Nations

UNEP- United Nations Environmental Programme

ESOK- Ecotourism Society of Kenya

IUCN- International Union for Conservation of Nature and Natural Resources

EAWLS- East African Wildlife Society

USA- United states of America

UK-united Kingdom

ABSTRACT

This study was conducted in Amboseli ecosystem. The study aimed at characterising ecotourism and assessing whether satisfaction was derived out of its experience; comparing vegetation attributes and wildlife numbers in areas of different ecotourism intensities; assessing ecotourism effects on the livelihoods of the host community and natural resource management; and documenting the constraints facing its progress in the area. The study-involved surveys on visitors to the ecosystem and the local community through the administration of questionnaires, vegetation sampling and animal counting that were field inventory based, and analysis on stakeholders through discussions. Stratified sampling was adopted for the survey on the community, wildlife counting and vegetation sampling.

Results indicated that most visitors came from the European countries (44.6%) and America (36.6%), and were interested in natural features. Wildlife safaris (96.1%) and photography (89.1%) formed the major tourist activities, which may have resulted from lack of tourism package diversification. Most visitors were satisfied with their trip experience (68.3%) and expressed the will to make a repeat trip to the place (99%). Visitation declined over the last decade (1990-2000) from over 200,000 to 87.000, which was attributed to declining environmental quality and competition from southern African nations among other factors affecting both regional and national tourism. The ecotourism effect on the livelihoods of the host community was more felt amongst the actively involved households through sale of artefacts and employment. The incomes obtained helped reduce the reliance on livestock for the involved households (60%) in comparison to pastoral (97.1%) and farming (65.7%) households. Non-actively involved households mostly benefited through social projects. The

pastoral households expressed a negative attitude to ecotourism and wildlife. Inequitable distribution of benefits (>70% in each group) was the most cited limitation to ecotourism. This made ecotourism an unattractive land use to most residents. There was continued reliance therefore on other land uses for survival. Costs from ecotourism unlike benefits were widespread and were related to competition for resources, disease transmission to livestock, loss of lives and injuries and the change of traditional practices and rules that governed proper resource use.

Regarding the positive aspects, ecotourism promotion enhanced the adoption of mechanisms for waste disposal, water treatment and pollution control amongst the lodge operators. It also encouraged the maintenance and increase of wild fauna. Wildlife species were evenly distributed in the area, showing no significant differences ($P<0.05$) in the three sites during the wet season. Significant differences ($P<0.05$) only occurred along distance gradients in the pastoral and nature-based tourism sites. The woody vegetation parameters under study too showed significant differences ($P<0.05$) among sites and along distances within sites. The participation of local people in ecotourism activities resulted in settlements, increased livestock numbers and reduced mobility that caused overgrazing and deforestation. The study therefore recommends that wildlife population dynamics be closely monitored to maintain environmental quality, environmental impact assessment be carried out before initiating community ecotourism projects, and diversification of tourism activities be enhanced. A mechanism should also be developed to ensure equitable sharing of benefits and promotion of environmental awareness amongst the local people.

CHAPTER ONE

INTRODUCTIOiN

1.1 INTRODUCTION

Tropical Africa covers 20% of the earth's surface and 62% of the African continent (Cole. 1986). Much of these lands are unsuitable for agricultural cultivation or mono-specific crop production because of low and abnormal rainfall patterns and distributions, and are therefore classified as rangelands. In Kenya, rangelands cover over 80% of the country's land area (Pratt and Gwynne. 1977; Mutharia. 1999). These lands support 35% of the human population, over half of the livestock population and a vast diversity of wildlife species (Mutharia. 1999). Majority of the people living in these rangelands are either pastoralists. agro-pastoralists or farming communities who try to eke a living by converting land that is unsuitable for cultivation to agricultural production. However, the larger part of these lands is open range under nomadic pastoralism where livestock production remains the most profitable way of utilisation (National Development Plan. 1989-1993). Nevertheless, the human coexistence with wildlife has been a reality since times immemorial before the creation of National Parks and Reserves. Because of the high wildlife species diversity, wildlife and nature-based tourism lias been a major activity over the last fifty years (Mutharia, 1999).

Before 1970's, the tourism industry ranked second to oil in the world economy, but has greatly expanded over the years to be the leading industry. In world records, tourism records increased from 25 million people by 1945 to 250 million in 1980 (Whelan, 1991; Budowski.

1976). Tourism growth in Kenya was realised after independence with most of the visitors being nature-oriented; hence Olindo (1991) termed Kenya as "the old man of nature tourism"' i.e. a country whose history for nature-tourism dates back many years ago. This tourism growth has benefited many nations economically, thereby promoting high investment in the industry (Abraham 1980). Benefits have been realised in the employment sector in the hotel industry, tour companies, national parks, construction industry, agricultural sector, handicrafts and food processing industries. This has allowed citizens to participate in the cash economy, thereby raising their living standards. In addition, it has enabled the preservation of the cultural heritage of many nations and societies (Haulot. 1976). Kenya Wildlife Service (KWS) (1990) argued that the social and cultural interaction between the visitors and local peopie has given Kenya a chance to face a new and challenging situation that has enabled her to safeguard the cultural identity.

The tourism practice in the worid has mainly been in protected areas where local people have had no choice but to abide by the restrictive regulations while they forego their traditional resource use. It has been governed by the preservation and protectionist methods of administration. However, despite much effort, biodiversity continues to erode at a faster rate in many areas due to lack of environmental awareness and consciousness, lack of the will to conserve by local residents, population increase, and overgrazing. In a bid to reverse this situation, ecotourism projects were startec in ecosystems considered worth and critical for conservation.

Ecotourism as an activity within the broader tourism industry is relatively new. Its development resulted lrom the upcoming of environmentally conscious tourists who needed

to be in touch with nature and interact with the local people of the areas they visited, but still maintaining the ecological integrity of the ecosystems visited. The coinage of the term 'ecotourism" was first used by Ceballos-Lascurin in 1987 when he was visiting the rain forest of Central America (Boo. 1990). After observing the massive destruction of forests through logging, he among others thought of the way forward to save them from continued destruction. The solution was to give the natural resources a value, reflected by the fee one would pay to gain his/her experience in the area. The rationale of such a fee was to give the dependants of the resources an alternative source of income, such that they would maintain the resources instead of exploiting them unsustainably. To him. ecotourism implied the act of travelling to relatively undisturbed and or natural areas, with the specific objectives of admiring, studying and enjoying the scenery, its wild plants and animals, together with any existing cultural manifestations (Boo. 1990).

Soon after the realisation of possible conservation through the involvement of the local people to derive benefits, efforts were geared to spread this mode of resource management the worid over. Today, .he term often implies sustainable nature-based tourism but. where possible, incorporating the social and cultural dimensions, where visitors interact with local residents in national parks, remote areas or indigenous homelands (Heather. 1997). Thus, it impiies activities undertaken in communai lands or in protected areas that facilitate the conservation of the natural resources and improving the livelihoods of the people depending on such resources. Where it occurs in protected areas, it implies that either a certain proportion of the generated amounts flows back to the community for development purposes, or the local residents are allowed to undertake ecotourism enterprises, such as eco-lodges or tourist camp sites that generate incomes for the community (Laird. 1993).

Many of the protected areas in Kenya lie within the arid and semi-arid lands. These are areas where people were relocated to create lands for wildlife. However, these lands could not hold all wildlife as 70% of the wildlife resources are found outside protected areas on tribal lands (Mutharia. 1999). This situation created the need for local involvement in conservation efforts to alleviate the declining wildlife population trends triggered by lack of local ownership, overgrazing and agricultural activities. Thus, after the formation of KWS as the overall conservation body, local participation in the neighbourhoods to parks and in ranches was initiated. The revenue sharing policy and several community conservation projects were initiatives of spreading wildlife-based earnings to mitigate conflicts between wildlife and local people. This formed the starting point of ecotourism pilot projects in focal areas known to harbour a high diversity of wildlife, such as Amboseli ecosystem. Laikipia. Samburu. Maasai Mara and part of Coast province. Their design was intended to assist local residents obtain benefits from conservation activities in order to change their attitudes and accept them as a land use option.

1.2 STATEMENT OF THE PROBLEM

While literature about ecotourism success in conservation and community development in Costa Rica. Belize. Puerto Rico. Australia and Zimbabwe anions other nations abounds (Wearing and Neil. 1999: Wearing and Larsen. 1996: Wearing, 1993"). little is available with regard to its progress ana challenges in Kenya. It is known that the success of ecotourism depends upon three issues: visitor satisfaction, resource conservation and contribution of benefits to local residents. However, there is no concrete evidence apart from claims that

ecotourism has been successful. The questions of whether the visitors acquire their satisfaction from the visit, how much benefits are generated for the society, who benefits, whether the benefits are effective to change people's attitudes towards conservation, and how local residents feel about ecotourism remain unanswered and largely speculative. It was within the context of these issues that this study was conceived and conducted.

1.3 STUDY OBJECTIVES

The broad objective of this study was to establish the performance and challenges of ecotourism in Amboseli. and its effect on the livelihoods of the local residents and natural resource conservation/management in Olgulului group ranch.

The specific objectives were to:

- document ecotourism activities, attractions, visitation levels over the last decade, ana assess whether visitors get satisfied with their trip experience.
- compare vegetation parameters (density, cover and diversity) and wildlife abundance in areas of differing ecotourism levels to assess its effect on natural resource management.
- assess the effects of ecotourism on the host community in terms of benefits received, costs incurred, enhanced local participation, and how this translates into their attitude towards conservation.
- document the major constraints to ecotourism in the region.

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1.4 HYPOTHESES

This study was based on the nuil hypotheses, that:

- there is no appreciable difference in vegetation attributes (cover, density and diversity) and the number of wild animals between areas of different intensities of ecotourism development.
- there was no significant difference in visitation levels over the last ten years to this ecosystem.
- benefits are uniformly distributed among the areas with different ecotourism intensities.

1.5 STUDY RATIONALE

Available literature indicates that less scientific work has been done in tourism destinations in Africa than in Europe and North America, and this hinders effective management of such ecosystems (Mangubuli. 1992). For effective resource management and monitoring of ecosystem sustainabilitv to create a basis for long-term planning and management, scientific work is called for. Moreover, studies done in Amboseii have only focussed on animal ecology, ecosystem dynamics and visitor aspects, with little or no attention to ecotourism effects on the local society and on natural resource management, in order to make it a conservation tool and an alternative land use. Therefore, the findings of this study should provide useful information for policy makers in ecotourism management and resource conservation both in this ccosystem and in other parts of the country.

1.6 THE STUDY AREA

1.6.1 Location

The study was conducted in Oluulului group ranch and the adjoining National Park in the .\mboseli ecosystem (Figure 1.1). The ecosystem is located in the southern part of Kenya.

approximately 240 kilometres from Nairobi, and adjacent to the Tanzania border. It covers an area of 3,000 km", mainly of arid bushland and grassland interspersed with swamps (Mutinda. 1997b). Western (1973) gives detailed information of the ecosystem.

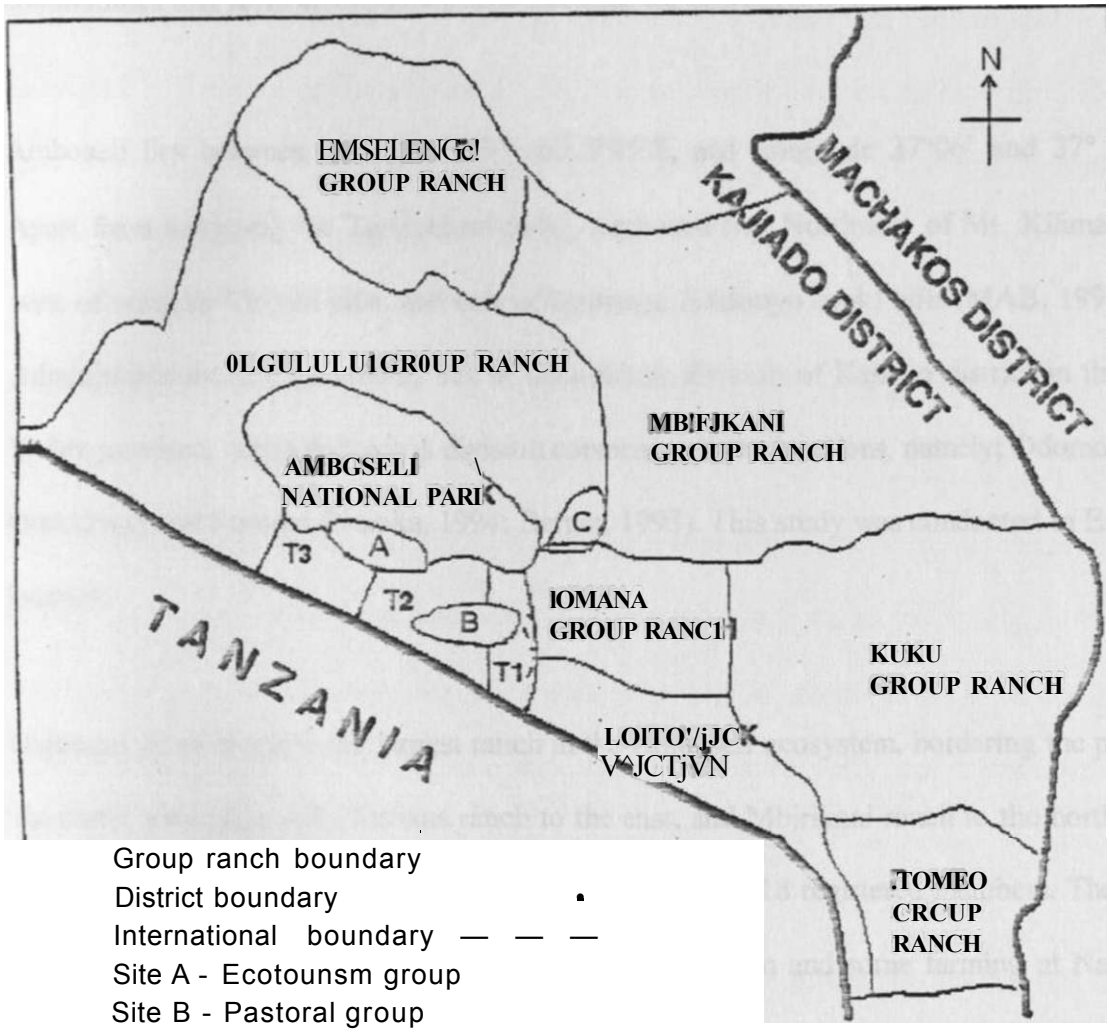

Figure 1.1: The Nationai park und group ranches in the Amboseli ecosystem

Source: Smith (1996)

The ecosystem comprises the Amboseli National Park, six group ranches surrounding it and other 48 individual ranches that exist on the higher and medium potential areas (KWS. 2000). The National Park, which forms the core of the ecosystem, covers approximately

10% of the ecosystem covering an area of 39.026 hectares with a buffer zone of 244,000 hectares and a transition zone area of 200.000 hectares. However, the core area contains most of the swamps that form the vital foraging grounds for large mammalian and birds communities that form an important resource base for ecotourism (Mutinda. 1997a).

Amboseli lies between latitudes 2°33' and 2°45'S. and longitude 37°06' and 37° 24'E. Apart from bordering the Tanzanian border. Amboseli lies Northwest of Mt. Kilimanjaro, west of volcanic Chyulu hills, and east of Namanga (Oldonyo orok) hills (MAB, 1997-98). Administratively, the ecosystem lies in Oloitokitok division of Kajiado district in the Rift Valley province, with Oloitokitok division comprising three locations, namely; Odomongi, Orokkitang and Entonet (Nzioka. 1994; Berger. 1993). This study was conducted in Entonet location.

Olgulului group ranch is the largest ranch in the Amboseli ecosystem, bordering the park to the north, west and south. Kimana ranch to the east, and Mbirikani ranch to the north-east. The ranch covers an area of 147.000 hectares with over 3.418 registered members. The main activities revolve around pastoralism. wildlife conservation and some farming at Namelok and Murotot areas (KWS. 2000). Wildlife activities are concentrated around Kitirua concession area leased to tour companies of Ker and Downey, Kimbla Safaris and Acrom'oile and Kent. Much of the ranch land has little potential for wildlife viewing during the dry season due to lack of permanent water sources, forcing over 80% of wild animals to get back to the park during the dry season.

1.6.2 Climate

Amboseli ecosystem is characterised by a semi-arid climate with very low bimodal rainfall patterns (Mutinda. 1997b). Pratt and Gwynne (1977) classified the area within the ecological zone V. Rainfall is low and erratic ranging between 240 mm and 400 mm per year, which is attributed to the ecosystem position on the rain shadow of mount Kilimanjaro. The two distinct wet seasons come in the months of March to May (long rains) and November to December (short rains) (Thorsell *et* ***al.,*** 1981: Western. 1973).

The maximum temperature during the warmest months is 33°C during the day while that of the coldest month is between 27-28°C (KWS. 1991). A study by Altman *et al.* (2001) on temperature and rainfall over a period of 25 years revealed that the variability across months in average daily maximum (or minimum) temperature was less than the difference between average minimum and average maximum within any month. Moreover, there was a dramatic increase in temperature from 1976 to year 2000 with average daily maximum temperature increase of0.275°C. which was four times the increase of 0.071 °C in the daily minimum.

According to Altman *et al.* (2001), significant temperature increase occurred in all months of the year, with increases being greater in months that exhibited higher average maximum temperatures. The increase in daily maximum temperature was in the magnitude greater than the 0.2-0.3°C rise attributed to global warming (IPCC. 1996). Moreover, due to the proximity of the ecosystem to Mt. Kilimanjaro, its weather ana its permanent waters are highly affected by the conditions on the mountain. From 1976-2000. rainfall was found to exhibit patterns of high variability across months and among years although there was no evidence of directional change over that period as did with temperature (Altman *et al.*.

2001). Figure 1.2 shows the rainfall patterns for the ecosystem based on the calendar year, where the calendar year implies the duration covered from the beginning to the end of the year. The prevailing wind direction is between 070°E and 080°E, which is calm at dawn, rising to 6 - 7 km/hr by 8.00 a.m. and getting stronger by 8.30 a.m. due to surface heating process. This creates a dusty period for the rest of the day (Nzioka. 1994), characterised by whirlwinds. Moreover, recurrent droughts and potential evapo-transpiration of 2200mm per year typifies the region (MAB, 1997-98; KWS, 1991).

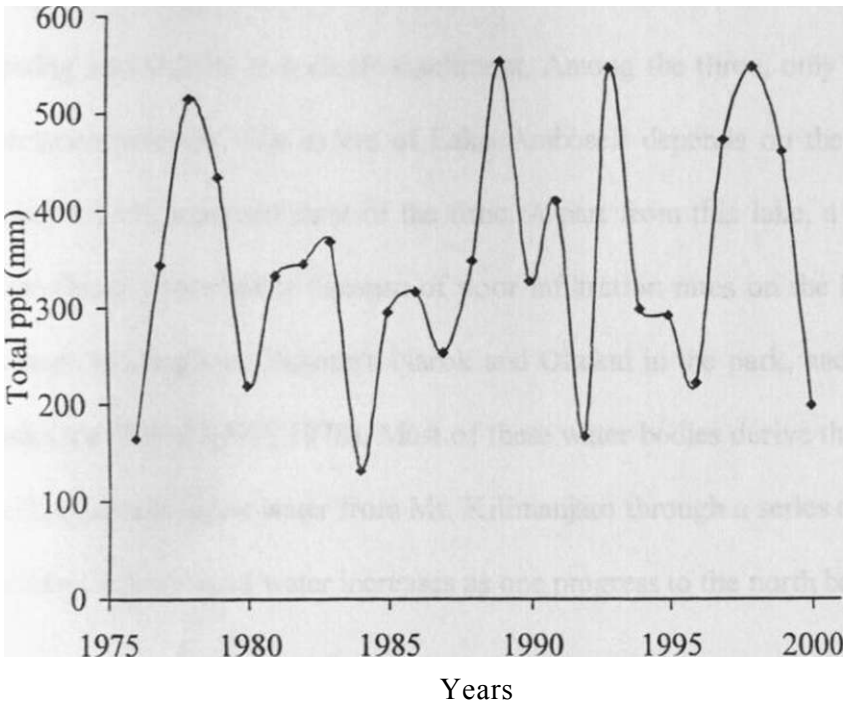

Figure 1.2: Total annual precipitation, 1976-2000 by calendar year

Source: Altman *et al.* (2001)

1.6.3 Topography, drainage and hydrology

The ecosystem is characterised by very low relief with altitude ranging between 1000-1300m, but some few prominent hills of voicanic origin arise about 100m above the

surrounding area near the southern border. The drainage system is closed with the low-lying Pleistocene lake Amboseli acting as the sump. The principal water catchment is Mt. Kilimanjaro although Ilaingurunyeni hills. Oldonyo Orok and Meto to the west provide some additional inflow to the basin (Western. 1973). While no major surface streams enters this basin, snowmelts and rainfall from the mountain percolates through the lava soils emerging as permanent springs or swamps in the Amboseli basin.

Western (1973) reported that this ecosystem covers three separate drainage units that comprise the Amboseli, Athi (Selengei and Kiboko rivers) and Tsavo, with Tsavo and Athi flowing into Galana as a single catchment. Among the three, only Athi fails to carry some permanent streams. The extent of Lake Amboseli depends on the level of rainfall, which makes it to be seasonal most of the time. A part from this lake, a considerable area of the basin floods periodically because of poor infiltration rates on the lacustrine clays, forming swamps at Longinye. Enkong'u Narok and Oltukai in the park, and at Namelok outside the park area (FAO/UNEP, 1978). Most of these water bodies derive their water from springs of cold, clear non-saline water from Mt. Kilimanjaro through a series of aquifers. However, the salinity of the ground water increases as one progress to the north basin.

The basin hydrology is characterised by high water table varying between surface levels wherever the topography dips sufficiently, to 7-1 Om on the central plain. However, KWS (1990) argue that the hydrology of the ecosystem remain not well understood, but there is the consensus that the water table keeps on rising, changing the size of swamps in the park.

1.6.4 Soils

The soils of Amboseli ecosystem are classified together with most of the Iikisongo soils under the Kenya topography or soil association 25 that comprises the chestnut soils with planosols in drainage depressions (Western, 1973). FAO/UNEP (1978) reported that these soil types range from red sandy basement soil to the north and north-east, brown lavas to the south-east, and whitish alkaline soils derived from the ancient lake, the remnant of which forms the western part of the basin.

Western (1973) and Thorsell *et al.* (1981) argued that these soils are derived from two principal sources of; physical and chemical weathering of Precambrian igneous rocks that forms the soils north of the basin, and volcanic rocks from Mt. Kilimanjaro that form the soils on the southern part. They therefore reflect the geological processes responsible for their formation and the effect of closed basin drainage. The major soil groupings are from sedimentary lacustrine ash deposits, while the hot and dry climate with its high evapo-transpiration resulted in the upward movement of salts in the soil, creating varying degrees of salinity and alkalinity conditions that support limited vegetation growth.

1.6.5 Vegetation

The vegetation of this ecosystem is said to be under the control of the edaphic factors, particularly those associated with lacustrine clays. This view is held because studies done have attempted to describe the vegetation in the park with little attention to that outside.

KWS (1991) and MAB (1997-98), however, described four vegetation types, namely the *Commiphora* and *Acacia* woodland vegetation (10%), the saline/alkaline plains with *Sueda monoica* and *Salvadora persica* (50%), the *Acacia* woodland with yellow barked *Acacia*

xanthophloea and *Acacia tortilis* (30%). and the remaining as swampland (10%), which supports sedges and *Cyperus* species, e.g. *Cyperus papyrus.* Within these four vegetation types, the common grasses identified included *Aristida* sp., *Digitaria* sp., *Sporobolus* sp.. *Cynodon dactylon* and *Phragmites mauritianum.*

Mutinda (1997a) reported that most areas, especially the flood plains are covered with savannah grasslands. These plains include the Mbirikani flood Plains, the lake Amboseli plain, and Remito flood Plains. Shrubs and scrublands are abundant and extensive, covering most of lands outside the park apart from where these flood plains exist. Woodlands and forests also occur, although their occurrence is patchy and dependent on swamp water and/or high rainfall. Mutinda expounded that woodlands of *Acacia xanthophloea* form an important vegetation cover around swamps, while natural forests of indigenous trees are found at Namanga hill and Oloitokitok. The woodlands around swamps present a unique habitat rich in adapted plant species, and given the low rainfall and high evapo-transpiration that occur during most of the year, the swamps play a special ecological role in the dynamics of plants and animal relationships in the ecosystem.

Western and Sindiyo (1972) reported that *Acacia mellifera. Acacia tortilis. Balanites* and *Commiphora* species dominated the woody component of the ecosystem in the past decades. The herbaceous layer comprised the *Aristida keniensis, Chloris gayana. Chloris roxyhurghiana* and *Sericocomopsis* species. Moreover, in areas that were characterised by poor drainage. /Jcacia *xanthophloea* was slowly replaced by salinity resistant species like *Sueda monoica.* Currently, the basin area has experienced extensive loss of trees and associated shrubs that constituted the *Acacia xanthophloea* and *Acacia tortilis* woodland

component of this savannah habitat (Altman *et al.,* 2001). Rather than the previous woodland-grassland mosaic, the basin vegetation is characterised primarily by open grassland and an increased area of open water and salt pan with shrub layer dominated by halophytes. The loss of the woody component is attributed to an array of factors such as the rising water table, the increasing salt levels in the soil, the grazing patterns, the natural ageing of woodlands, and the damage from an increasing and increasingly resident elephant population (Altman *et al.,* 2001).

1.6.6 Fauna

The diversity of habitats in the ecosystem suggests the diversity of animals because each animal species is adapted to exploit a certain kind of habitat mosaic. Grasslands form suitable grounds for the grazers, and where such conditions prevail, large herds of plain game are evident. Within the woodlands and bushes, browsers find their haven. MAB (1997-98) reported that the ecosystem carries about 79 species of known mammals and 425 species of birds. These mammals include; the baboon (*Papio cynocephalus),* vervet monkey *(Carcopithecus aethiops),* Lion (*Panthera leo),* Cheetah (*Acinonyx jubata*), leopard *(Panthera pardus),* elephant (*Loxodanta africana*), zebra (*Equus burchelli),* Hippopotamus *(Hippopotamus amphibius),* Buffalo (*Syncerus caffer),* Grant gazelle (*Gazelle granti),* spotted hyena (*Crocuta crocuta*), wildebeest (*Connochaetes taurinus),* Gerenuk *(Lito eramius walleri),* fox *(Otocyon megaloti)* among others.

For the case of birds, the prominent ones include the southern banded snake eagle *(Circactus fasciolatus),* Taveta golden weaver *(Ploceus castaneiceps*) and three species of sandgrowse visiting the permanent waters in the dry season. Others include the waterfowls, e.g. the

migrant squacco heron (*Ardeola idae),* the Taita falcon (*Falcon fascimucha)* and lammergeir *(Gypaetus barbatus)* (MAB. 1997-98).

Elephants exploit the woodlands and grasslands habitats depending on water availability. Their impact on the swamp vegetation is immense especially during the dry season when their movement patterns are restricted by water availability. FAO/UNEP (1978) indicated that by 1977 when ban on hunting was imposed, the elephant population had declined to less than 480, while only seven rhinos remained from the 44 that existed in 1972. The current situation has greatly changed. The elephants' population is estimated to be over 1200 while the rhinos have been wiped out of the ecosystem (Moss, personal communication). Information gathered attributed the decline of rhinos to poaching and the loss of woody vegetation that forced them out of the park into surrounding ranches where they were subjected to poaching.

Swamps carry many aquatic life forms such as fish and annelids. They also form important foraging grounds for a diverse range of animals including the arthropods, molluscs, reptiles, amphibians, birds and mammals (Mutinda. 1997a). The number of the various species within the given phyla varies in time and space, depending on the prevailing conditions of water, forage or host availability. These swamps are sequentially used as the dry season progresses, with the large herbivores penetrating them first. This makes the park to act as a focal point for about 95% of the water-dependent wildlife species during the dry season (Thorsell *et al,,* 1981).

The most migrant wildlife species are the elephants, zebras, buffaloes, wildebeests and the gazelles. Their migration patterns between the park and the surrounding group ranches are marked by the onset of the rainy seasons (March-May and November-December). They move out of the park due to forage and water availability in the surrounding ranches, only to return during the dry season (Jan-February and July-October). The direction of their movement from the basin ranges from north-west to east, depending on the location of the earliest rains (MAB, 1997-98, FAO/UNEP, 1978).

1.5.7 Ecosystem accessibility

The ecosystem is accessible through both air and road transport. Several roads either from Nairobi or from Coast can lead one to the ecosystem. KWS (1990) indicated that the main road runs from Nairobi to Namanga covering a distance of 165 kilometres. Then through an earth road, the park can be accessed via the Meshanani gate. An alternative route from Nairobi is through Emali leading either to Iremito or Kimana gates. The third route from Coast passes through Tsavo National Park and enters the park through Kimana gate. Air transport is also available by small aircrafts that ferry visitors to the airstrip in the park or outside in the Kimana group ranch.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter gives a review of available literature on issues covered in this study. It describes what ecotourism is as understood in the current context, who an ecotourist is and how ecotourism affects the livelihoods of the local residents through benefits and costs. Emphasis has also been placed on how ecotourism activities affect natural resource management, and the factors constraining its effective development, especially in Kenya.

2.2 ECOTOURISM: ACTIVITIES AND MOTIVATIONS

The term ecotourism as used today is a relatively new word. Its existence came into being through the efforts of Hector Ceballos-Lascurin in the 1980's who provided a definition that is still widely used by writers. To Cebailos. it implied the act of travelling to relatively undisturbed natural areas with the objectives of; admiring, studying and enjoying the scenery, its wild plants and animals, together with any existing cultural manifestations (both present and past) (Boo. 1990; Fillion *et al.*. 1994; Laird, 1993; Wood, 1997; Lindberg, 1991; Blaggy and Wood. 1992).

Literature indicates that the term was coined to provide for an alternative use of the rainforest resources in Central America in order to save them from the effects of logging (Wearing, 1993). This was promoted by a wave of environmental awareness that was sweeping across the world, led by the environmentally conscious groups. It provided an opportunity of using tourism activity as a tool for protecting natural ecosystems by giving

them a socio-economic value that would generate incomes for the dependants, thereby inhibiting unsustainable uses (Fillion *et al.,* 1994). So far. it has gained world-wide recognition, and is viewed as one way of achieving sustainable development of areas where tourism is practised, especially the protected areas and remote communal lands (Chizhova, 1996)

Today, ecotourism exists cither in active or passive forms (Weaver, 1998). The active form entails a behaviour or lifestyle change by the participant to involve actions that contribute to the welfare of the environment. The passive form on the other hand implies that the participant does not need to have a behavioural change, but acquires his or her satisfaction out of what the environment offers. One only makes sure that the actions involved do not impact negatively on the physical environment.

Effective ecotourism requires the travel to involve some characteristics that are progressive to the environment and the local people. They include travelling to a natural destination, minimising negative environmental impacts, building of environmental awareness, generating direct finances for conservation, generating financial benefits and empowering the local people, having respect for the local cultures, and supporting human rights and democracy (Johnstone. 1999). However, some activities that do not follow these principles and practices are also termed as ecotourism. They are attributed to the works of the unscrupulous hoteliers, greedy tour operators and the old well-intentioned brochure writers who use the term ecotourism to market their products. This has given rise to the proliferation of advertisements as eco-tour. eco-traveL eco-vacation and eco-expedition, among others in the travel industry (Weaver. 1998).

Although the term ecotourism has existed for more than two decades, different studies have used different names to refer to it. Such include nature tourism green tourism, wildlife tourism, alternative tourism, and sustainable tourism among others (Lindberg, 1991; Wearing and Neil 1999; Wearing and Larsen. 1996). This results from lack of a universal measure of what should be termed ecotourism or who would be termed as an ecotourist (Weaver. 1998). This has made studies to use different parameters to rate it or differentiate it from other forms of tourism. Nonetheless, Mutharia (1999) concluded that ecotourism activity must take the element of community involvement in identification, planning and implementation of its activities for it to be real ecotourism.

Ecotourism does not only imply the act of going to the rainforest or the total existence in communal areas (Elizabeth and Nicole, 1999). It can occur in protected areas and National parks provided the revenues obtained support the maintenance of the park system, with a substantial proportion flowing back to implement community development initiatives in the park's neighbourhood (Laird. 1993). This suggests that to understand its contribution, assessment should be done on the surrounding neighbourhoods to parks to assess whether the contributions are positive or negative.

In East Africa, the term ecotourism came into use and to adapt to the realities during the 1990s although it was a big business even before the term was coined (Benn. 1991). This is because ecotourism is taken to be synonymous to wildlife tourism, which occurs in remote and natural areas (ACC. 2002). What is called ecotourism today only describes goals that had been worked for more than two decades. It has then become a growing force for

responsible tourism and conservation in the region (Elizabeth and Nicole, 1999). According to the usage and implementation of the term ecotourism by Ecotourism Society of Kenya (ESOK), it implies to principles and practices that promote responsible tourism, contribute to resources conservation and rural development. It is meant to bring equity to all stakeholders, which is achieved through clear policy or ownership of resources, and the adherence to environmental management standards of proper natural resources use, wildlife management, waste management, energy conservation and water cycling (ESOK, 1997).

Ecotourism enhances the conservation of resources by bringing environmentally friendly and conscious visitors, who are willing to pay to view the rare and interesting species together with their habitats (Benn. 1991). This offers an alternative to the increasing threats posed to environments of destinations by mass tourism (Wearing and Neil, 1999). In the recent times, many nations have turned to use ecotourism as a remedy to the environmental problems they are facing in the field of conservation. Wood (1997) attributed this to the idea that, many view it as a travel paradigm that has helped to transform nature and adventure tourism industry in some parts of the world. Studies show that ecotourism can only achieve this through the adoption of environmentally friendly activities. Such include; camping, river rafting, wildlife safaris, wildlife viewing, photography, geological explorations, natural objects paintings, trekking, bird watching, botanical studies and mountain climbing (Ceballos. 1996; Mutharia. 1999; Whelan. 1991). However, such activities only favour nations that are rich in biodiversity (Fillion *et al.,* 1994), among them Kenya. Tanzania. Puerto Rico, Costa Rica. Nepal and China (Nzioka. 1994; Ceballos, 1996). The rapid spread of ecotourism activities from the central core of its coinage (Central America) to these destinations over duration of about two decades has been facilitated by several factors. The

most influencing being: the role of media with its emphasis on environmental problems: the desire to experience a natural setting different from urban centres; the desire to extend an already developed ecotourism experience and the increased health consciousness. Others include better salaries; long paid leave; falling international fares and the rapid expansion of the tourist facilities (Muthee, 1991; Whelan, 1991; Ceballos, 1996).

2.3 ECOTOURISM ATTRACTIONS

An attraction may be anything or a feature within a destination place that draws tourists by appealing to their desires, tastes, curiosity and interest (Makopodo, 1994). Their scope vary from a wide variety of physical settings/establishments that provide a pull for the travellers to visit destination regions (Gunn. 1988). However, although the motivation for travel is to satisfy various needs and wants, it is also driven by certain characteristics such as natural resources, climate, cultural history and ethnicity, and accessibility. Homewood and Rodgers (1991) and Little (1962) argued that for the foreign tourism to flourish, it mainly depends on the possibility of seeing beautiful sceneries, wildlife, indigenous cultures and archaeological remains, all in unexploited settings. These features in a region provide the basis for ecotourism development and they form the most essential element of the tourism product (Inskeep, 1991). Without them, the pleasure-oriented tourism cannot be effective. This therefore depicts that most attractions are of natural origin. For example, a study by Makopodo (1994) around Lake Victoria region of Kenya found that most ecotourists were interested in nature-based features such as wildlife rather than farmlands, industrial or tourists' facilities as expected by the local people and tour-operators.

2.4 ECOTOURISM AND THE ENVIRONMENT

The tourism industry remains the industry that depends on the world natural systems and resources more than any other does (Neale. 2000). Its relationship with the environment is of interdependency rather than mere interrelationship (Alderman. 1994). This is because it requires the environment for its sustenance, while it maintains the environment from its proceeds. However, it can cause both positive and negative impacts on the environment just like any other industry, thereby acting as a force for environmental conservation or degradation (Boo, 1990).

The conservation aspect arises out of the generation of finances used to manage the destinations, and by offering alternatives to unsustainable land uses (Boo, 1990; Wearing and Neil, 1999; Whelan. 1991). For instance. Laird (1993) upon evaluation of ecotourism role in Santa Elena rainforest project found that it motivated the conservation of forest resources from destruction by offering the local people alternative means of livelihood, in addition to increasing environmental awareness. This reduced the acts of logging that previously threatened the rainforests. Moreover, the generated amounts add to the establishment and management of more natural areas and give the local people and government the incentives of maintaining such areas intact (Laird. 1993; Butler. 1992).

Ecotourism by bringing environmentally friendly visitors ready to pay to view the natural features and species in their natural states also creates environmental awareness among the local people (Benn. 1991; Wearing and Neil. 1999). This awareness is driven by the emphasis of natural resources as the focal point of attraction in ecotourism (Makopodo, 1994). Moreover, the contribution made by tour operators and other stakeholders through

investments in efforts to maintain their businesses also play a role in environmental appreciation. This is because the decline in environmental quality leads to decline in ecotourism business (Ceballos, 1996). The need to maintain the environmental quality therefore makes ecotourism planning and management be based on the resource limitations to avoid exceeding the use that may alter the environment significantly (Wearing and Neil, 1999).

Environmental degradation from ecotourism occurs in form of habitat destruction, direct impact on wildlife, introduction of toxins and pollutants, and the introduction of non-native species (Mathielson and Wall, 1982). The extent of such ecological changes varies widely depending on the scale of evaluation. Generally, ecotourism does not cause widespread environmental modification as with other land uses. Its impacts are localised or at species-specific level (Gakahu and Goode. 1992). The effects arise through trampling by human feet, animals and vehicle wheels, poor garbage and sewage disposal construction of tourist facilities and exceeding of the carrying capacity of an area. Moreover, the effects arise from competition for resources between ecotourism and other land uses, and over-coilection of firewood for tourism industry and local people's use (KAVS, 1994b; Morrison and Selman. 1991). Such effects are mostly felt in many developing nations adopting ecotourism because they lack the financial and technological capability to handle issues of tourist resource consumption and waste disposal (Topfer. 1999). Trampiing is a common effect in many tourism destination points and results from off-road driving or diversions. Through observations and measurements accompanied by simulation experiments, trampling has been found to cause devastative environmental conditions especially in the fragile ecosystems (Muthee. 1991).

The repercussions of all these acts are the reduction in plant biomass. loss of vegetation cover and changes in the species structure and diversity (Jaap and Visser, 1991). For instance, Jaap and Visser (1991) and Visser and Koyo (1992) found that tourism activities along the Kenyan coast had serious effects on natural forests. Different kind of uses brought directly or indirectly by the tourism industry's demand resulted in the reduction of the natural forest density and diversity. The Ebony and Mangrove trees were highly reduced by clearing for farming, building, lime burning and most highly carving, all of which were driven by tourism forces to meet a certain demand within that sector.

Wearing and Neil (1999) showed that competition for resources also induces environmental effects through competing land uses, but mostly if the ecotourism does not sufficiently provide for the local resource dependants. They found that such competition for resources by ecotourism and farming in Galapagos, Ecuador, resulted in the extinction of 12 plants species. Similar situations were observed in India and Nepal where rapidly increasing ecotourism activities competing with local resource uses introduced destruction of forest cover.

The introduction of non-native plants species affect vegetation composition (Mathielson and Wall. 1982). For example, the introduction of *Lantana camara* species for landscaping in the Maasai Mara lodges caused vegetation change over large areas. The *lantana camara* outdid the indigenous vegetation, affecting plant's composition and consequently the area's wildlife (Johnstone, 1999). Negative impacts on individual wildlife species result from deaths through accidents or changes in the wildlife behaviour, e.g. feeding and breeding

habits that may threaten their survival (Nzioka, 1994). This occurs upon the alteration of the animal habitats by acts of ecotourism. such as creation of structures in wildlife vital breeding sites, or in habitats for endemic species (Neale. 2000). The physical presence in proximity to the natural habitats from off-road driving has also been proved to disturb wildlife to the extent of altering their behaviour. Studies on flamingos along the Mediterranean coast and Mexico, and on carnivores (cheetahs and lions) in East Africa revealed that overcrowding, noise and harassment by tourist vehicles reduce the hunting success of the carnivores to less than half. The disturbances on the flamingos feeding and breeding behaviour caused starvation, reduced breeding success and increased alert behaviour (Lusigi, 1981; Neale. 2000: Rosenfeld *et al*1999).

2.5 **ECOTOURISM BENEFITS AND COSTS**

2.5.1 **Benefits**

Tourism related activities generate benefits that are numerous and varied. They result directly or indirectly to nations or localities where such activities are carried out. Mathielson and Wall (1982) reported that most of such benefits are either of economic, physical or social aspects. They revolve around the generation of foreign exchange, employment opportunities and earnings, increased standards of living, improved communications, retained cultures and traditions, progress of agricultural markets, development of infrastructure, and industrial development. Moreover, there is the enhancement of mutual understanding and peaceful coexistence among the people involved (Moshi. 1992), provision of a new awareness of the sensitivity of the planet and needs of the local peopie (Neale, 2000). Although most studies done to arrive to such conclusions have featured national and international levels (Mathielson and Wall. 1982), studies done in

Australia. Central America and Africa indicate that ecotourism has the potential to generate benefits at the local level (Kibasa, 1998; Wearing and Neil, 1999, Kiss, 1990; Wearing and Larsen, 1996; Wearing, 1993; Hercock, 1999).

Most of the benefits highlighted by these studies to the host communities are of social nature rather than to the individual participant. For example, Kibasa (1998) in Tanzania and Johnstone (1999) in Kenya found that the benefits received in the ecotourism areas concerned were in form of schools, hospitals or clinics, roads, water projects and initiation of small businesses out of the induced market demand. The major problem facing effective realisation of benefits by communities in East Africa is that most park tourism generated revenues are lowly returned to societies most affected by conservation acts. If they do, they rarely reach the very communities most affected by conservation acts (Enghoff, 1990).

Ecotourism activities play a major role in stimulating local economies in a region/locality. Studies by the Department of Foreign International Development (DFID. undated) in Zimbabwe, and Wearing and Darcy (1998) in Australia showed that the local people in the two countries were able to start low cost economic activities out of the growing number of ecotourists. In Zimbabwe, the activities undertaken by the local residents included furniture making, cultural activities, food and beverage making, selling and distributing fuel wood, offering of transport and distributing game meat among other rural based economic enterprises. Moreover, other benefits resulted from compensations made for the forgone benefits because of using the land for parks, training and sharing of wealth generated by park tourism (IUCN and European commission, 1999). In Kenya, such was the policy adopted by KWS in the early 1990's of sharing 25% of its gate entry fees with local

communities living in neighbourhoods to parks although it did not work effectively (KWS, 1994a). For the few years it was operational, Krausman and Bissonette (1995) found that it formed an extra component of income generating option for the ranchers, and strengthened compatible land use systems within the rangelands.

Other benefits of ecotourism existence are its contribution to sustainable development of the areas it is practised in (Munasinghe and McNeely, 1994). However, such development is only achieved when the generated amounts effectively flow back to the concerned communities to enhance development of physical infrastructure, such as roads, telephone lines, or other physical infrastructure that are directly or indirectly used by the local people (Lindberg, 1991). A study by Homewood and Rodgers (1991) in Ngorongoro, Tanzania, found that the construction of a road for use in tourism to the Ngorongoro crater was of benefit because it facilitated marketing and delivery of grains and livestock. In Kenya, the arid and semi-aid lands face the greatest challenges to sustainable development because of their low potential for economic activities. The presence of tourism and ecotourism activities present an important opportunity for their development by providing services and income sources, and by opening up some areas that could not be reached by the so called modern civilisation (KWS, 1994b).

Although benefits from ecotourism may be numerous, their realisation are sometimes offset in the eyes of the local people by intrusion of tourists, greater income inequality within and between communities, increased pollution, sequestering of profits by outsiders, and by increased costs of living (Wearing and Neil. 1999). For example, a study by Wearing and Larsen (1996) in Santa Erena found that although the local residents realised ecotourism

benefits, they complained about increased costs of living and intrusion by tourists who they felt were introducing values repugnant to their traditions. Out of ecotourism in Maasai Mara, the local people derived money from leasing the land, had a school constructed for them and environmental measures implemented. Nevertheless, the restriction on livestock grazing near the camps, affected their grazing and settlement patterns (Johnstone. 1999).

2.5.2 Costs

Like benefits, costs are varied and numerous. They result from coming into contact with wildlife, loss of land resources depended upon by the residents, construction of tourism facilities or by breakdown of the socio-cultural ways of the people (Laird. 1993; Wearing and Larsen. 1996). In East Africa most of these costs result from living with wildlife that support tourism and ecotourism activities because over 70% of the wildlife resources are found on tribal lands (Mutharia. 1999). Protected areas cover small areas that cannot hold all wildlife, making pastoralists to live and maintain a national asset at their own expense (Pratt and Gwvnne. 1977). Kagwana (1993) upon studying the relationship between the Maasai and elephants in Amboseli concluded that most people sharing their range with wildlife incur costs directly or indirectly. These are in form of competition for water and pastures, diseases transmission to livestock, human life loss and injuries, disruption of school programs and the destruction of existing infrastructure and installations (KWS, 1994b).

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Where wild animals are highly concentrated, several costs occur that negatively impact on local people lives. First, there is the creation of national parks and game reserves that restrict people from their traditionally used resources. Rosenfeld *et al.* (1999) reported that this actually happened in Kenya and Tanzania. In Kenya, the Maasai people were evicted from

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their grazing fields to make land for wildlife while in Uganda, the confinement of the former nomadic IK tribe to small mountainous areas, forced them to abandon their nomadic way of life and adopt subsistence farming, which they were never successful.

Secondly, tourist facilities tend to come up when land is leased out for ecotourism or set a side as a park. Because of their improper management and high demands for environmental resources, such as water and fuel wood, the ecosystem resources are severely affected. For instance, in Maasai Mara, high environmental repercussions sprang from improper landscaping, waste disposal and overuse of trees for fuel (Johnstone. 1999). Such situations present chances for desertification that highly reduces the sources of people livelihoods. Leases entered for ecotourism practices also deprive off resources highly dependent upon, a fact that has been observed in East Africa. Asia and South Europe (Rosenfeld *et al.*. 1999). Barrow (1997) attributed it to the fact that such leases are entered into with community leadership without the involvement of the majority, as happened with the initiation of ecotourism projects in North East Coast of Zanzibar where people were denied access to their local fishing grounds.

Increased cost of living result when products are sold at high prices to reflect tourism values, or when land speculation occurs forcing local residents to sell their lands they depend on for survival (Rosenfeld *et al.*. 1999). Increased costs of living also occur out of the high tourism revenue leakages, when expensive inputs are bought in efforts to boost the local tourism (Laird. 1993). A study by Lindberg (1991) in Zimbabwe estimated that only 10% of the tourism expenditures were captured at the local level to enhance the lives of the residents because the rest of the amounts were ploughed back to purchase expensive inputs to sustain

ecotourism. Similarly, Wearing and Larsen (1996) found that such leakages were major hindrance to the progress of ecotourism in Santa Erena region in its initial years. While most costs are economic in nature, socio-cultural ones do occur. They mostly result from the introduction of foreign cultures as prostitution, drug abuse, loss and commercialisation of traditions and disruption of the social functioning of the society (Nyeki. 1992).

2.6 THE ECOTOURIST

An ecotourist is considered as an individual who is attracted to natural areas with his/her main interest being to observe, study and admire the natural features found there, while practising a non-consumptive use of natural resources (Ceballos, 1992). Eagles (1992) on studying the Canadian ecotourists found that most had their interest or motivation for travel in tropical forests, birds, lakes and streams, trees and wildflowers. mammals, mountains, and oceans. Very few were interested in indoor activities, such as gambling, nightlife, or being in big cities. The study also indicated that ecotourists enjoy personal development through physical activities, experiencing new and simpler lifestyles, meeting people of similar interest, seeing cultural activities and buying local crafts. This scenario portrays that their interest is in natural features: hence, the reason why they engage in environmentally compatible activities where nature rather than humanity predominates (Wearing and Neil. 1999). They like visiting the wilderness and National parks, hiking, viewing birds, mountain climbing, camping, botanical studies, and wildlife safaris, among others (Whelan. 1991).

Ecotourists interest in nature comes in different degrees. Some are the so-called '"hardcore" or dedicated tourists, while others are "soft" or undedicated tourists (Nzioka. 1994; Lindberg, 1991). The dedicated ones have their interest in nature as the central focus of their

experience. They comprise the scientific researchers, members of tours designed for education or other similar purposes, and those who take trips specifically to see protected areas and understand the local cultural history. The soft or undedicated ecotourist only take trips as an annual routine or partake nature incidentally as part of a broader trip. Because of this, true ecotourists require a high level of ecological information and discovery from the ecotourism experience in their host destinations. Environmental conditions thus become a major issue because that is where they gain their satisfaction (Rosenfeld *et al,,* 1999). A study by Conde Nest Travellers Magazine in 1996 found that 91% of the respondents were concerned about environmental conditions of their destinations before making their travel plans. A further 25% changed their travel plans due to perceived environmental problems in the intended destinations.

They also have a higher sense of environmental and social responsibility and a greater demand for tourism products that do not degrade the environment. Because of this, many express the will and do contribute to conservation efforts. Boo (1990) reported that a study in Philippine found 70% of the respondents were willing to spend an average of US S50 more per trip than other mainstream tourists to help conserve areas they visited. Making a contribution for environmental conservation of the destination point adds to their satisfaction.

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Whelan (1991) and Boo (1991a) noted that ecotourists come from relatively affluent states, such as the USA. Germany, Sweden. UK, Canada. Australia and Japan, because citizens from these countries have high incomes and more leisure time that they can afford to travel abroad. Moreover, ecotourism is highly developed in some of these states, such that they

need to extend their already developed experience to more wildlands in developing countries. Their main destinations are countries rich in bio-diversity, such as Kenya. Tanzania. Puerto Rico, Costa Rica. China. Mexico and Nepal (Boo, 1990). Their numbers vary with a destination point visited or considered at a particular moment. Studies indicate they are estimated to comprise 40-60% of all international tourists, although their numbers keep on increasing at a rate of between 10 and 30% annually (Boo, 1991b, Wearing and Neil, 1999). Apart from being nature lovers, they are well-educated professionals who combine educational pursuits with physical activities (Boo, 1990; Whelan. 1991). A study by the Ecotourism Society in Ecuador, found 50% of those surveyed were in possession of postgraduate degrees (Wood. 1997).

2.7 CONSTRAINTS TO ECOTOURISM DEVELOPMENT

Weaver (1998) argues that ecotourism in Sub-Saharan Africa (Kenya included), has not taken effective trend to the expectations of many nations. Analyses showed that this results from a multiple of factors. Among them: the negative public image created within the tourists markets; foreign exchange constraints that impede on the provision of necessary tourism infrastructure: shortage of skilled labour; weak institutional frameworks for effective tourism planning and the chronic political instability engulfmg many nations. In spite of the fact that these may be chronic to many ecotourism developments, other area-based issues, such as corruption, chronic poverty, distance from countries with high ecotourists and competition from intervening destination opportunities that are perceived to be more stable also play a major role. In fact, the development of ecotourism in most Southern Africa states has proved to be a major hindrance to Kenya's ecotourism development (Kipkeu. personal communication).

Studies by Nzioka (1994), Namwalo (1992) and Othoehe (1999) showed that limitations to ecotourism development in Kenya result from habitat or ecosystems loss, rapid human population increase, over-utilisation of natural resources, poor marketing strategies, land use conflicts and government policies. Although each of these has a significant impact, the most impacting ones remain the population increase and land use change. Kenya occupies a land mass area of about 569,260km" with only one fifth of it receiving enough rain for effective agricultural production (Pratt and Gwynne, 1977). The arable part carries four-fifth of the rapidly increasing population in spite of the declining land productivity. This forces many people from these areas to seek for alternative lands in the marginal areas previously used for wildlife (Nzioka. 1994). Together with their farming cultures and the shrinking land area, is the requirement of vast lands for wildlife movement. This creates conflicts that force wildlife to be restricted to smaller pockets of protected areas.

Human settlement and expansion of urban centres have resulted in closure of major wildlife corridors as witnessed around Kitengela and around Maasai Mara group ranches (Namwaio, 1992), eventually confining wildlife in parks. This causes park degradation to extents that they are not attractive for ecotourism purposes. In addition, the restriction of animals to parks by human activities cause their deaths (Weaver. 1998). Where some parts of protected areas remain, they get pressure from illegal community encroachments because they are accustomed to utilising natural habitats for grazing, hunting or for collection of natural resources. All these forces downgrade the efforts of making ecotourism sustainable. This then imposes the tasks of seeking for ways that will provide for ecotourism. and cater for the needs of the local residents.

2.8 ECOTOURISM AND LOCAL PARTICIPATION

Different writers have used the term local participation in different situations and in different ways but implying the same issue. Drake **(1991)** and Kiss **(1990)** defined it as the ability of the local communities to influence the outcome of the development projects, such as ecotourism that affect them. Cernea (1991) defined it as the empowering of the people to mobilise their own capacities, be social actors rather than passive subjects, manage the resources, make decisions and control the activities that affect their lives. Several reasons dictate why it is imperative to have local participation. First, conservation efforts have become next to impossible to succeed without the commitment of the local residents. The increasing world population makes the exclusion of local communities from protected areas to be no longer feasible (Wearing and Neil, **1999).** Secondly, the sustainability of ecotourism projects depends on the acceptance and support by the local community. Therefore, community involvement in all stages becomes a vital strategy to ensure that projects are sustainable socially, environmentally and economically (Wearing and Larsen. 1996).

In the past decades, people who live adjacent to parks and protected areas have experienced tourism impacts, a phenomenon that is common in developing nations. The protected areas are governed by the wilderness model that excludes local populations by viewing them as impediments to effective wildlife conservation. This makes the local populations feel being of less importance than the wildlife, resulting in detrimental impacts on conservation (Nzioka. 1994). Local participation as a tool is therefore used to reverse this attitude. It allows for the deccnterisation of power and less top-down planning by the experts, giving

the greater role of management of the resources to local people who hold the resources as ancestrally theirs (Durbin. 1992). This helps to recognise the people's rights and interests over resources, and enhances the implementation of appropriate management structures and institutions for proper representation. Projects without effective local participation in identification, design, implementation and evaluation are less likely to provide widespread community benefits (Cernea, 1991).

Having known the reasons for participation, the question of how and at what levels should participation be implemented remains. Paul (1987) reported that local participation is executable at levels of information sharing, consultations, decision-making and in initiating actions. However, while decision-making and initiating of actions involves the community in the whole process of development, information sharing and consultation processes only allow people to receive benefits without empowering them to make decisions. It is only when conservation projects are set up with an infrastructure that vests control within the community that genuine ecotourism is achieved (Wearing, 1993). The techniques to achieve it being group discussions, public meetings, open-ended surveys and research teams (Drake. 1991).

Local participation carries with it several advantages. It creates a sense of ownership that triggers support for conservation (Ceballos, 1992), provides viable alternatives for sustainable use of resources (Boo. 1990), creates local goodwill that allows local control of ecotourism impacts, opens up more resources for ecotourism and taps local skills and knowledge to enrich ecotourism (Mutharia. 1999). Moreover, it helps change people's attitudes to wildlife conservation (Johnstone, 1999), provides tourists with an authentic

experience (Wearing and Larsen. 1996), makes the local people useful at the project implementation stage (Mutharia. 1999), and ensures effective land use plans that do not contradict with conservation goals (Rosenfeld *et al*1999). Drake (1991) reported that it also provides warning systems for the project managers to plan for decisions that might cause conflicts while educating local residents more about the project benefits. This creates a possibility of benefit flow to target groups by creating accountability among managers. The disadvantage with local participation is that it may anticipate for more than the project can deliver or was initially planned for, increasing the costs. Moreover, when benefits fail to reach the targeted groups or when delays arise, disappointments crop up. Local and regional political conflicts concerning the project also gain ground, paralysing the project initiation and creating unexpected problems.

While local participation may have its own disadvantages, exclusion of local residents from planning may cause greater risks likely to cause conservation and ecotourism to collapse. In Lauvi lagoon. Solomon Island, the exclusion of local residents in planning of ecotourism by some developers resulted in siting of resorts in crocodiles infested areas where even local people never swam (Rosenfeld *et al.,* 1999). In India, the creation of national parks to save tigers without consulting local residents for alternative grazing sites, led to livestock overgrazing in the buffer zone and sometimes wandering into the core area, competing for fodder with the tigers' natural prey, a situation that drove the project to a failure.

2.9 CONCLUSION

From the literature, it is evident that the term ecotourism has been used differently in different situations without a standard definition. It has been used interchangeably with

nature tourism, wildlife tourism and sustainable tourism. For the case of this study, the definition implied by ESOK of ecotourism as a means of enhancing conservation and spreading the tourism benefits through involvement of the local people in carrying out tourism activities will be adopted. Therefore, for the case of Amboseli. ecotourism will imply a situation where local residents are involved in tourism by undertaking conservation and development projects or activities, all geared towards promoting conservation and rural development. Secondly, the effects of ecotourism on communities in terms of benefits, promotion of local economies and costs vary with regions and in magnitude. Studies also have given the characteristics of ecotourists and ecotourism: hence, by analysis using the already known ecotourism characteristics, one can conclude whether ecotourism exists in a certain region. Finally, local participation in ecotourism is vital for it allows the communities to have a word in conservation. Ecotourism therefore serves as a vehicle for involving local people, but where local participation fails, ecotourism in most cases fails.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes methods used in data collection and analysis. The study employed two phases of data collection: primary and secondary data. Primary data were gathered on socio-economic aspects of the local Maasai people and the visitors to the place, each by use of a questionnaire, while discussions were adopted to gather information from other tourism stakeholders operating in the ecosystem. Data on vegetation and wildlife were collected through field sampling in three sites and filling of data collection forms. Primary data were however supplemented with secondary data from relevant institutions, personnel and reviews from libraries.

3.2 DATA COLLECTION

3.2.1 Data collection on the local community

Data on community views were collected from three groups of the Maasai people who live in the vicinity of the park. Stratified random sampling (Steel and Torrie, 1980) was adopted in choosing the households to be interviewed. This stratification was based on the area and economic activities the people engaged in. The questionnaire approach based on open-ended and closed-ended questions was used to gather information relevant to this part of the study. The questionnaire carried questions that were thought would bring out differences between households directly involved in ecotourism and those not. These related to household aspects and environmental issues.

The adopted stratified random sampling involved two stages or phases. The first phase was to stratify the population into groups depending on the area and involvement in ecotourism activities. This was geared to find out whether tourism activities had an effect on all the people in the group ranch, and how this translated into willingness to conserve. Based on this stratification, three groups were identified, namely:

- Enkong'u Narok group involved in pastoralism and ecotourism (ecotourism group)
- Olmoti-Iimarba-oldure group involved in pastoralism (pastoral group)
- Osoit-oldonyo group involved in pastoralism and irrigated farming (farming group)

Households in ecotourism and pastoral groups were first listed down by establishing the number of "manyattas" or "bomas." and the number of households within each manyatta. For the farming group, households were easily identified because each household had settled on its own unlike where several households were clustered together to make a manyatta in pastoral setting.

The second phase involved the selection of actual households to be interviewed within each group using the complete random procedure. To ensure random distribution of interviewed households, the total households were first counted and listed from 1 to N in each group, where N represented the total number of households in that group. A certain range of households on the list was known to represent a particular manyatta depending on the number of households previously encountered in it. Random table numbers (Gomez and Gomez. 1984) were then used to select the households to be interviewed.

At the manyatta level in the ecotourism and pastoral groups, the first people from different

households to be sighted were targeted for interviewing. Changes were necessary where women were encountered for they were requested to inform their husbands if present, or in cases where other spotted parties felt incompetent to reveal family information. This was driven by the fact that the Maasai culture prohibits people considered as strangers from talking to women. Men in this society are considered more informed about family matters. Therefore, the information obtained was likely to be a better reflection of the ecotourism effects on households and society. Women were only interviewed in cases where husbands could not be reached within the selected household, or in case of single mothers' households. One copy of the questionnaire was used for each household, whose execution was carried out by trained enumerators. However, where Kiswahili language was applicable (for the educated or those who understood Kiswahili), the investigator carried out the interviews.

To prevent interruption and creation of curiosity during the interviewing process, the interviews were conducted at some distance from the manvatta. This was mostly in the morning hours when it was possible to meet most of the manyatta members before they left for other activities. A total of 105 households were interviewed in the three groups, each with 35 household respondents. This represented 23%, 40% and 37% of households in the ecotourism. pastoral and farming groups respectively.

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Since not all information could be captured through the formal questionnaire, informal discussions were held with manyatta leaders, group ranch leaders, personnel from conservation groups encountered during the study period, and the KWS staff. Elders' meetings and/or rest times provided extra opportunities for the discussions. These

discussions targeted crucial issues relating to challenges faced in running ecotourism projects, environmental and conservation matters, benefits received and costs incurred, and the social effects. The qualitative data gathered through the discussions were then incorporated during the compilation of the study results. The Statistical Package for Social Sciences (SPSS) was used for analysis and the results were presented using descriptive statistics and regressions.

3.2.2 Survey on visitors

The survey on visitors (both local and international) aimed at revealing the major type of tourism in Amboseli. its performance, and whether services offered (both environmental and catering) provided satisfaction to ensure its sustainability. A questionnaire designed to gather information about personal assessment of the environment, participation in various activities, attitudes to charged fees, rating of experience gained, and problems encountered, among others, was distributed to visitors during the April-July period of study.

The lodge and camp management assisted in the distribution of the questionnaire through its reception personnel. Thus, before the actual distribution, discussions were held with lodge and camp managers, informing them about the purpose of the study, and requesting for their assistance. Each willing visitor was issued with a copy to fill and was requested to leave it at the reception or in the room. This formed the main method of distribution, as most visitors were known to spend at least a night in these facilities during the course of their trip. Initial efforts of distributing the questionnaire at the gates did not work effectively. This was because some visitors (one-day or half-day visitors) could not manage to fill them in the course of their time in the park, thereby leading to losses. Moreover, the constant change of

gate personnel provided no opportunity for good follow up.

Two hundred copies of the questionnaire (110 in English. 45 in German and 45 in French) were distributed during the study period to three lodges, one tented camp and the public campsite. The French and German questionnaires had been translated from the English version through the assistance of a language tutor. During the study time, which mostly involved the low season and a month of the high season, efforts were made to observe what visitors involved themselves in during their trip. This was by driving across the highly visited portions of the park while making sure no realisation of the intent was noted. Discussions were also held with willing English-speaking visitors when an opportunity existed to gather views about their experience.

By the end of the study, 117 (58.5%) copies of the questionnaire were recovered, with 101 (50.5%) fully complete for analysis and sixteen (8%) incomplete. Out of the remaining 83 (41.5%), 32 (16%) were unfilled while 51 (25.5%) could not be traced. The information collected through the questionnaire was analysed using SPSS and results presented in percentages, tables and graphs. Further analyses using chi-square tests were employed to test for dependency among variables.

3.2 J **Data collection on woody vegetation**

Before the actual collection of data, two weeks were spent familiarising with the area to select the sites for vegetation study. Three sites were selected depending on the main uses, whose identification was based on personal observation and in consultation with the local peopie. The identified areas were:

- Olkelunyiet-Angata Rangai area on the eastern side of the group ranch and south of the park headquarters where pastoralism formed the main activity due to its distance from tourism centres (Pastoral site).
- Enkong'u Narok where pastoralism and cultural tourism are practised. Much of the ecotourism in this ecosystem is practised around this area due to proximity to tourist centres (lodges). Six of the seven major cultural manyattas within the ecosystem and the public campsite were located in this area (Ecotourism site).
- Kitirua concession area, used for nature-based tourism and camping. The area had been leased to tour companies for camping and game drives. However, a few manyattas were found for local residents who had settled before the land was leased. It therefore exhibited low grazing by domestic livestock as opposed to other areas (Nature-based tourism site). Information from the park management and the local people indicated that ecotourism development in the Amboseli ecosystem started here.

To collect data on the woody vegetation, a six kilometre transect was established in each site starting approximately half a kilometre from the park boundary. The boundary was identified by the local people, as no marking existed. The starting point of each transect was randomly selected and sampling points established at regular intervals of one kilometre. The main considerations then became the equidistant sampling points from the park across the sites. At each sampling point, three sub-transects of 60 metres, perpendicular to the main transect were established to mark out the sampling plots. Each sampling plot was positioned ten metres from the assumed main transect, and measured 50m x 5m (length by width). These sampling plots were used to collect records for calculation of density, cover and diversity. They formed the sampling units. The establishment of transects running from the

park boundary into each land use area was meant to test whether there was uniformity in vegetation attributes across the areas with different uses as the distance progressed away from the park.

Shrubs were abundant and formed a significant amount of the vegetation. This made the intended line intercept method for crown cover measurement inadequate. To effectively deal with this situation, the line method was adjusted by expanding it to a belt of 50m x 2m. The crown cover for shrubs and trees was estimated using crown diameter method (Dumbois and Ellenberg, 1974; Kershaw, 1973), where any plant whose crown was intercepted within transect belt was measured. This involved the vertical projection of the crown outline onto the ground for trees and tall shrubs. Dwarf shrubs were easily managed due to their low height, enabling their crown length to be measured without downward projections. For tall trees and shrubs, a sighting instrument (spirit level) was used to ensure proper projection of the crown outline was effected. The two perpendicular crown diameters were recorded and the crown cover tabulated based on the following formula:

$$A = n\ t^{2}$$

where. $D = \frac{D_{-} + D}{!}$,

and. $D| =$ diameter 1

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D2 = diameter 2

Density is defined as the number of individuals per unit area (Cook and Stubbendiek, 1986). It is useful in evaluating shrub and tree stands. It is estimated by counting the number of

individuals in a quadrat. This procedure, as elaborated by the two writers, was employed for density calculation based on the following formula:

$$\text{Total number of individuals} \over \text{Total area}$$

Any plant species and their numbers encountered within the 50m x 5m plots were recorded. The collected data for density calculation were found useful in the calculation of diversity indices based on Simpson diversity index as elaborated by Brower *el al.* (1989). This index considers the number of species (rij) and the total number of individuals encountered in the plot (N), thus:

$$\pounds n (N - 1)$$

where, $V \over N (N - 1)$ represents dominance with

s = number of species

nj = number of individuals per species

N = total number of individuals

Plant identification was necessary to enhance the separation of individual plant attributes. This was carried out in the field through the assistance of a plant taxonomist. Plant names of the encountered plant species were listed down in botanical and local names whenever possible for later reference. For the case of the unidentified plants, they were pressed for further identification at the Department of Range Management herbarium. University of Nairobi. The collected data were analysed using SPSS and Excel. Analysis of Variance

(ANOVA) was used to test for significant differences, while t-tests were used to test means along the same distance gradient across sites or between two distance gradients means along the same transect.

3.2.4 Wildlife counting

The numbers of animals anu species composition were assessed in areas under which the vegetation study was conducted. It was thought that this would reveal the pattern of wildlife distribution in each site with distance from the park. The roadside count method (Brower *et al.,* 1989; Klein. 1965) was used for this exercise. Driving paths in Kitirua and Olkelunyiet-Olmoti areas were used as roads, while in Enkong'u Narok where no such paths existed, walk count was found convenient. Along these paths, regular intervals of one kilometre were estimated and any animal species sighted together with their numbers were recorded. However, where drive count was possible, low speed driving was adopted to avoid disturbing the animals in order to enhance proper recognition and counting of animal species.

Owing to the fact that not all places were clear enough to enable the sighting of an animal at longer distances, regular stops were made depending on how visible the area was to give time for observation and counting. About ten minutes were spent at each stop for exhaustive observation using a pair of binoculars before the next move was made. For effective observation and counting on both sides of the path, two observers were engaged. This occurred between 4.00 p.m. and 6.30 p.m. when animals were known to be actively feeding, and could be easily identified and counted even at a distance. The numbers of animals sighted were recorded for analysis.

The counting exercise took a period of three weeks during the wet season (April-May). This is the time when animals migrate to the neighbouring ranches and are therefore likely to exhibit their proper distribution in the surrounding areas. Five days were dedicated to each area on an alternate basis between the three sites. ANOVA was used to test for differences among sites and along distance gradients.

3.2.5 Analysis of stakeholders

Analyses of stakeholders involved discussions with parties engaged in ecotourism activities, such as the KWS, lodge operators, tour companies and conservation groups in the area. The key informants were targeted for the discussion. Tour operators on the other hand were contacted through e-mail letters, but where it was possible to arrange for meetings, discussions were held. Tour drivers were nevertheless contacted during the data collection period because they offered relevant information regarding the environment. The information sought was on the type of tourism, role played by each party, the issue of local involvement, distribution of benefits, and the relevance of ecotourism to conservation of resources. Where ecotourism as a land use is effective, stakeholders are actively involved in initiatives to conserve. They also involve the local people in their activities in order to increase environmental awareness and benefits. This is rather different from the general tourism. Therefore, the results from this section would reveal how far ecotourism has developed, and whether it has become self-regulating without external intervention.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents and discusses the results of the analysis of data on the survey on visitors and the local community, vegetation inventory, animal counting and stakeholders. The survey on the local community gives an insight into how the local Maasai people regard ecotourism activities as a land use. how it has affected their livelihoods and their environment. The results from the survey on visitors shows the kind of travellers to the place, how they consider the destination point and the local people, while results on vegetation and wildlife give an insight into the effect of land use on natural resources. Descriptive statistics, especially frequency distributions, ANOVA, regression analysis and t-tests, were used for analysis. The information from the discussions with the stakeholders gives an indication of their views on the impact of ecotourism on the environment and local residents. It also indicates whether ecotourism has attained self-regulation in the ecosystem.

4.2 SURVEY ON VISITORS

4.2.1 Visitors' countries of origin

A total number of 101 respondents were captured by this survey. They came from seventeen countries around the world. USA had the highest number of respondents (36.6%) followed by UK (16.8%) and Germany (7.9%). Kenya and France tied each with 6.9% of the respondents. The respondents from Switzerland. Italy, and Spain comprised a total of 13%, while the rest of the respondents were classified as rest of the world (Table 4.1). This

indicated that most visitors were from the Europe union countries (44.6%) and America (36.6%). Whelan (1991) and Weaver (1998) argue that most ecotourists to African countries. Kenya being among the highly visited, come from Europe. North America and Japan. The main reasons for this are that citizens of these countries earn high incomes, and have more leisure time to afford holidays abroad. Moreover, ecotourism is well developed in some of these countries (Whelan. 1991), thereby increasing the need to extend the already developed ecotourism experience into more wild parts of the world.

Out of the total respondents, only 16.8% were on a repeat trip to Amboseli ecosystem. The making of a repeat trip indicated an association with the country of origin (X^2=40.802, P=0.001) because most visitors on a revisit trip were from USA, UK. Germany and Kenya. Germany and Kenya carried 29.4% each of the respondents on a repeat trip. Going by the park records for the years 1990 to 2000, it was evident that USA and UK nationals comprised the highest number of visitors to Amboseli each year, which is attributed to the good air transport network between these countries and Kenya. While such high records were recorded from the developed nations, records from other nations were generaily low. There is need to investigate the reasons behind this in an effort to boost their visitation levels.

Table 4.1: The countries of origin for the tourists visiting Amboseli National park

Country of origin	Percent
USA	36.6%
UK	16.8%
Germany	7.9%
France	6.9%
Kenya	6.9%
Switzerland	5.0%
Italy	5.0%
Spain	3.0%
Rest of the world	12.0%

Source: Author. 2002

4.2.2 **Reasons for choosing Amboseli, the attractions observed and activities engaged in**

Most respondents chose Amboseli as their destination point for several reasons as shown in Table 4.2. Wildlife viewing was the major reason for 93.1% of the respondents, while observing natural sceneries and landscapes ranked second. This concurs with the observations of Marsh (1991) and Eagles (1992) among the ecotourists to Antarctica and Canada respectively, where the main motivations were wildlife viewing, other natural features and the local cultures. Non-ecotourism activities (enjoying sunshine, visiting friends and having a business break) carried less than 10% of the respondents' reasons. This is because most non-ecotourists favour the three S's (sun, sand and sea) and they prefer spending their time at the beaches or in big cities but not in wild places (Wearing and Neil. 1999).

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Results also indicated that no one chose the area for the purpose of visiting friends. This suggests that there is no relationship between the local people or those working in the area and the external visitors. The education purpose on the other hand only motivated 16.8% of the respondents. Lindberg (1991) noted that some ecotourists are scientific researchers or

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members of tours designed for educational purposes, thereby making education a motivating factor for travel. Nevertheless, based on the number of reasons given by an individual respondent, those from USA and UK gave multiple reasons unlike the other respondents. This suggested the broad spectrum of interests they have in comparison to other visitors.

Table 4.2: The reasons cited by tourists for choosing Amboseli as the destination point

Reason	Response*
View wildlife	94 (93.1)
Observe nature and sceneries	51 (50.5)
Cultural history	43 (42.6)
Education purposes	17(16.8)
Enjoy sunshine	7(6.9)
Have a business trip break	2 (2.0)
Visit friends	0 (0.0)

* Figures in parenthesis represent percentages

Source: Author, 2002

The major attractions were classified as beautiful natural sceneries (84.2%), indigenous people and their cultures (88.1%), Mount Kilimanjaro (50.5%), swamps with birdlife (50.5%), and the famous wild animals (93.1%). Amboseli is known for its large herds of grazing ungulates, which are legendary on the plains, forming a significant attraction to thousands of marvelling visitors. Mount Kilimanjaro on the other hand is famous, for it provides a superb backdrop for wildlife photographs. Based on the attractions recorded, it is evident that the Amboseli ecosystem is endowed with various natural attractions. Moreover, the responses illustrated the interest ecotourists have in natural features rather than the man-made ones, such as lodges and camps, which concurs with findings of Makopodo (1994).

On assessing the potential for ecotourism activities, it was revealed that the Amboseli ecosystem carries vast resources with high potential for different ecotourism activities. The

resources range from beautiful landscapes to water bodies and abundant wildlife. However, the respondents mentioned wildlife safaris (96.1%) and photography (89.1%) as the most important activities engaged in. Bird watching (50.5%) and enjoying the view of natural landscapes (37.6%) were also important. Although Boo (1990) found that most ecotourists like engaging themselves in such activities, camping (12.9%), hill climbing (5.9%) and trekking (5%) were not important as wildlife safaris because they are not fully developed or are not appreciated by the visitors. They were only common to respondents from USA UK and France.

Camping was prioritised as a community enterprise service because of the campsite in the group ranch, and was meant to help the local community tap incomes from the visitors (Masinde. personal communication). However, the campsite was highly neglected, lacked proper security, while the necessary amenities were inadequate or lacking. Its improvement would create an extra exciting activity for people interested in bush life. All in all. there is need to diversify ecotourism activities to include those with high potential and environment friendly. Such may include water rafting or canoeing in the swamps, fishing, botanical studies, hill climbing and nature walks in the group ranches.

Because of the limited activities to engage in, the mean length of stay was 2.5 ± 1.27 days with a mode of two days (Figure 4.1). Majority of the respondents (52.5%) stayed in the park for two days, while 15.8% visited the park for a day. Nzioka (1994), on assessing the visitors' preference in the area, found the mean trip duration to be two days, which indicates that there has been no change in the visitation duration over the years. The short length of stay can be attributed to several factors. These include the over-reliance on wildlife safaris

as the main activity within a small area of the park and the concentration of calm animals in the open plains and around the swamps, making wildlife observation within a short period of time possible.

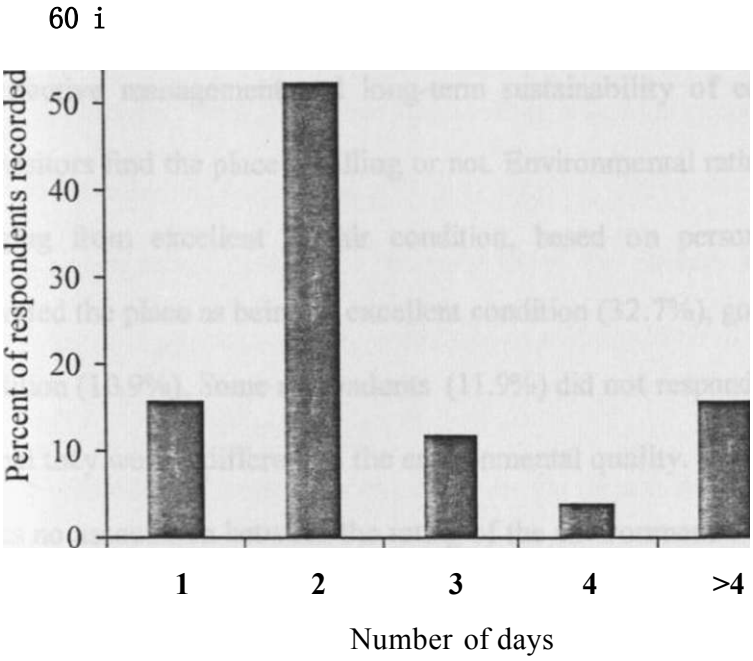

Figure 4.1: Recorded length of stay in the Amboseii ecosystem

Source: Author. 2002

A study by Wearing and Darcy (1998) on backpackers in Australia found that the possibility of ecotourism to contribute to local economies is dependent upon the length of stay the visitors make, for it determines the amount of expenditure. Therefore, proper diversification i of ecotourism activities and implementation of measures to disperse animals from the core area to increase the time spent in sighting them would increase the length of stay, consequently increasing the incomes for conservation and local residents' livelihoods. On the basis of nationality, visitors from France recorded the highest mean number of days (7)

followed by Germany (5) since some respondents from these countries were on academic trips that took longer than the normal visits.

4.2.3 Visitors' assessment of environmental quality

The need to know whether the environmental quality of a place pleases the visitors is that it allows for effective management and long-term sustainability of ecotourism. It reveals whether the visitors find the place fulfilling or not. Environmental rating was given in three classes, ranging from excellent to fair condition, based on personal observation. The respondents rated the place as being in excellent condition (32.7%), good condition (44.6%) and fair condition (10.9%). Some respondents (11.9%) did not respond to this classification, suggesting that they were indifferent to the environmental quality. Further analysis indicated that there was no association between the rating of the environmental quality and frequency of visit ($x^{2=}$ 6.420, P=0.093). A majority of the respondents who considered it to be in fair condition (88%) spent only two days, while only 55.6% and 51.5% of those who considered it to be in good and excellent conditions respectively spent two days. Results indicated that most of the respondents who exceeded two days were in the latter classes, implying that the duration of stay in a destination point is motivated by how pleasing the place is.

The concern for the environmental quality in ecotourism is driven by the fact that most ecotourists are environmentally conscious tourists who travel to wild places because of the desire to appreciate what nature provides. Many of them are members of conservation organisations or clubs in their country or internationally. They therefore require destination points that are environmentally friendly. From the results, it was found that 40.6% of the

respondents were members of conservation bodies, 59.4% were non-members. Therefore, slightly more than a third of the visitors were environmentally aware and informed. This compared favourably with the findings of Marsh (1991) amongst the ecotourists to the .Antarctica, where only 28% were members of conservation organisations. Moreover, Wearing and Neil (1999) reported that true ecotourists who are environmentally conscious comprise about 40-60% of the international tourists, although the proportion may vary from year to year. It is therefore clear that Amboseli receives a normal proportion of visitors who could be termed ecotourists or environmentally conscious. Chi-square analysis showed that membership to conservation clubs was independent of the country of origin (X^2=17.902, P=0.979), implying that environmentally conscious people could be of any nationality.

Based on this environmental awareness exhibited by the respondents and the environmental quality observed, the comparison of Amboseli with other visited places within Kenya would help reveal how the ecosystem faired nationally. Records show that the Amboseli ecosystem is one of the highly visited places in Kenya. Its world fame lures people from different parts of the world to come and see interesting features and cultures. In future, this will depend on whether visitors will find the place more interesting than the other places or not. Most visitors to Amboseli (68.3%) had visited some other parts of Kenya during the period of this study. Out of the 31.7% who had not visited, some indicated they had plans to visit other places and parks, with a few admitting that their main interest was, only in visiting Amboseli Park. Out of the 68.3% who had visited other places, their rating for Amboseli in comparison to other visited areas was as shown in Table 4.3.

Table 4 J: **Amboseli ecosystem compared with other visited places in Kenya**

Rating	Response *
Far much better than other places	26 (37.7)
Just the same	34 (49.3)
Worse or poorer	3 (4.3)
Not sure	6 (8.6)

* Figures in parentheses represent percentages; N=69

Source: Author. 2002

From the results, it is clear that the Amboseli destination point continues to face competition from other game parks and reserves in Kenya. This would affect its future visitation levels owing to the distance covered from the major towns of Nairobi and Mombasa, while one can access other parks and community conservation projects within a short time and quite easily.

4.2.4 **Problems encountered by visitors**

No serious problems were encountered during the visit except for the poor roads that were unpleasant to 57.4% of the respondents. The poor roads were said to promote incidences of off-road diversions. Vehicle concentration (9.9%) despite being lowly reported ranked second. Cases of a hostile host community and lack of guidance and information were rare (1%). However, although the host community was not considered hostile, some respondents expressed comments of discomfort with regard to selling of local products. The high

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competition by sellers at the entry gates was termed unpleasant, with some respondents considering it as a form of harassment. There is the need to consider how and where these transactions should take place. Most tourists come from non-bargaining cultures and they would feel offended when confronted with wares to buy. Effective marketing of these items

requires putting up display or curio shops in an organised manner, where items are priced for selection depending on preference rather than persuasion.

Nevertheless, even though the visitors encountered some problems while on their trip to Amboseli, 95% of the respondents expressed the will to make a revisit, with 99% admitting they would advise their friends or relatives to visit the place. This portrays the potential of ecotourism in this area if well managed, for Wearing and Neil (1999) noted that ecotourism success is not only measured in terms of the number of visitors who visit the operation at a particular moment, but by the likelihood to return.

4.2.5 Visitors' assessment of the cost incurred and gate fee charges

Amboseli National Park had the highest gate entry fee in Kenya by the time of study. This was implemented to curb incidences of mass tourism that previously characterised the place (Kipkeu. personal communication). Such a high fee is likely to affect the visitation levels if it does not reflect the experience one acquires. Rating of the trip experience with regard to cost (entry fee) showed that 68.3% of the respondents considered it worthy and 25.7% somehow worthy, depicting some level of dissatisfaction. Only 2% of the respondents considered it unworthy. This suggests that the majority of visitors' expectations were met or fulfilled. The rest could have had their experiences negatively affected by the environmental quality or any other negative attribute encountered within thd trip period. Chi-square analysis showed that the rating had an association with the length of stay in the area ($X,^{2}=67.480$, P=0.003), but was independent of the country of origin ($x^{2}=44.571$, P=0.614) and the number of times one visited the place ($x^{2}=2.527$, P=0.470). This suggests that those pleased with their experience spent a longer time than the non-pleased ones. In fact, the 2%

of the respondents who considered their experience as unworthy expressed no will to make a repeat trip to the place.

An assessment of the visitors' response to further increase of gate fees was evaluated. Tourism activities in any destination point should provide the financial resources for maintaining the natural resources they depend on. which is possible through the collection of entry fees by the park management or through donations from ecotourists. With respect to this, 55.4% of the respondents expressed support for entry fees increase for purposes of conserving and maintaining the visited place, 28.7% did not support it, and 14.9% were indifferent. Hence, it is clear that more respondents were willing to help conserve the area they visited. This supports a study in Philippines where 70% of the respondents were willing to spend an extra USS 50 per trip in aid of conservation compared to the mainstream tourists (Boo. 1990). Chi-square analysis showed that the support for an increased fee for conservation was independent of the will to make a repeat visit; hence, indicating the will to support conservation among ecotourists doesn't necessarily depend on whether they will revisit the area or not. In fact, 89.7% of non-supporting respondents expressed the will to return, as did 96.4% of the supporting group.

4.2.6 **Promotion of the local economy**

Ecotourism and tourism activities promote local economies by creating a market for local products. Results showed that 72.3% of the respondents purchased some locally produced items while 24.8% did not. The items on sale were classified into groups or combinations to show the ones most demanded, and expressed as a percentage of respondents who did purchase. The results showed that the highly bought items were bead works (30.1%),

carvings and bead works (28.8%), and carvings alone (27.4%). Lowly purchased items included animal horns (1.4%), carving and gemstones (2.7%), and carvings, bead works and animal horns (9.6%).

Out of this trade, the involved households earn some incomes for survival. Weaver (1998) and Eagles (1992) found that ecotourism and tourism activities in most cases only promote local economies through the purchase of such local products offered for market. Nevertheless, the purchase of local goods was associated with cultural history as the motivation of the visit (x^2=6.425, P=0.040). Most of those who were motivated by the cultural history purchased some local products, indicating that the interest in local peoples' cultures carries with it the broad spectrum of what people do and what they produce. Eagles (1992) reported that purchasing of local crafts and products is an observed characteristic among the ecotourists. This need to be properly harnessed by promoting more activities that bring together local people and the visitors in order for the local residents to tap more incomes through such sales.

Apart from promoting the livelihoods of local residents from the sale of local products, ecotourism should enhance local participation and control for it to be sustainable. Survey data indicated that 89.1% of the respondents were in support of local participation in ecotourism activities. Only 1% were not for that while 8.9% were indifferent. In addition to advocating for local participation. 47.5% of the respondents thought that the local people should be given the mandate to manage and control ecotourism and its benefits, but 21.8% opted for the co-operation between the local people and government, as shown in Table 4.4.

From the values in Table 4.4, it is evident that the highest number of respondents (47.5%) thought that the management and benefits of ecotourism should be under the control of the local residents. This shows that the modern tourists have concern for residents of their destinations. Consideration therefore to delegate and encourage much of ecotourism to be under local controls is necessary. Judging from the status of the local people for the current ecotourism performance, depending on observation. 59.4% of the respondents felt that they benefited from ecotourism. 27.7% felt that no benefits reached the common man. and 2% felt local residents had slightly benefited. The response of 59.4% could be attributed to the fact that most visitors come into contact with local people in Enkong'u Narok area where cultural Manyattas are located, and those working in lodges who are the main beneficiaries of ecotourism in the group ranch. This indicates the concentration of ecotourism activities and lack of spread into the entire ranch where visitors could be interacting more with the residents. The 27.7% response depicts how non-effective ecotourism is in improving the livelihoods even for the involved households.

Table 4.4: **Visitors response on who shouid manage and benefit from ecotourism**

Who should manage and benefit from ecotourism	Response *
Local people	48 (47.5)
Government and local people	22 (21.8)
Local people, government and tour operators	12(11.9)
Local people and tour operators	8 (7.9)
Government	8 (7.9)
Tour operators and private entrepreneurs	1 (1.0)
Government and tour operators	1(1.0)

* Figures in parentheses represent percentages

Source: Author, 2002

4.2.7 Visitors' learning of local cultures

Learning of local cultures and traditions gives an opportunity for the visitor to add onto the experience by understanding the association between the local people and their environment. While only 42.6% of the respondents chose Amboseli for cultural reasons, 83.2% managed to be informed about the local cultures through talks in lodges, camps or by visiting the cultural Manvattas. This is because modern tourists seek to experience nostalgia, history and art within a heritage site. Their emphasis is not only on the site, but also on getting a deeper involvement with societies and cultures, as Eagles (1992) observed among the Canadian ecotourists.

Another reason is that in the recent times, cultural and heritage tourism has been incorporated into tourism markets and the opportunity to sell it has been realised. Under such situations, the tour companies and lodges market themselves using the local cultures in the places they are located. Lodges and camps in Amboseli have learnt to tap the local cultural resources to diversify the range of services they offer to their customers. This is by offering cultural shows, dances and talks to visitors during the resting time, although these are only dedicated to willing visitors who want to supplement their environmental experience. Therefore, the 83.2% indicate the in-depth interest among the Amboseli visitors in knowing and experiencing cultures of their host community. Wearing and Darcy (1998) concluded that where such cultural and environmental activities are co-related, the appeal for ecotourism activities becomes high.

4.2.S Visitors[1] perception of the negative environmental aspects of ecotourism

Ecological or environmental problems are known to affect visitation levels of destination points. Rosenfeld *et al.* (1999) reported that ecotourists are more concerned about the environment when making their travel plans, and some do cancel their planned trips out of perceived environmental problems in the intended destination points. For some years, the history of Amboseli was known for its degradation from off-road driving, poor waste disposal and animal disturbance, causing the park management to move into action. Even though measures to alleviate the situation were implemented in the 1990's, certain negative environmental impacts, such as massive vegetation destruction by wildlife (23.8%), off-road driving (22.8%), and animal harassment (9.9%), were still taking place. Other minor ones included animal habituation (1%) reflected by the presence of monkeys around lodges, littering (2%), and pollution (1%).

The incidences of animal habituation and littering were alleviated through proper waste disposal. For example, incinerators are used for burning combustible materials that include food remains that attract wildlife, while non-combustible ones such as bottles, cans, and plastics are ferried to Nairobi for recycling or for proper disposal. Water treatment is also carried out to avoid groundwater contamination. This shows how serious conservation is being taken due to the requirement of higher environmental standards by ecotourists than the former mass tourists. However, although these efforts were implemented in lodges and the tented camp, it was not the case with some cultural centres and the public campsite. The latter were characterised by improper waste disposal in open pits that attracted birds and monkeys.

Vegetation destruction has been a major problem in the ecosystem, as reported by Shorter (1982), Western (1989), and Altman *et al.* (2001). Various factors are attributed to this, among them being the rising water table, increasing water salinity, ageing of trees, grazing impact and climatic change. However, the greatest impact could be attributed to the increasing animal numbers and their increasing resident status, with no proper monitoring of their population dynamics to keep up with the carrying capacity of the ecosystem. This results from the increasing prevalence of the financial rationale for ecotourism (e.g. by estimating a certain amount of revenue to be generated from the presence of a particular animal species per year) that may have become an obsession, superseding the consideration for the ecological value.

Information revealed that the vegetation decline and destruction started in the 1980's when poaching and spearing of animals in the neighbourhoods were high, forcing them to seek refuge in and around the park. Hunting in the neighbouring country, Tanzania, was also described as a force driving many wild animals to seek refuge on the Kenyan side where there is less pressure due to non-consumptive utilisation by ecotourism. This together with livestock grazing has increased the grazing pressure and destruction of vegetation from then up to the current time. Elephants debark and knock down most of the big *Acacia* trees, while grazing and trampling severely inhibit their regeneration. However, the water table rise on the other hand has been gradual, from about ten metres below the ground surface in the 1950's to about one metre in the 1990's, and cannot be ruled out as a factor in vegetation decline. The rising water carries with it salts that are thought to affect the trees rooting systems by altering the soil pH (Moss, personal communication). However, its effect was thought would not be drastic as that of animal destruction. In fact, the fenced areas around

lodges with no access by animals but with underground water have more woody vegetation than the adjacent open areas. This may illustrate the difference between the impacts of wildlife and water table rise.

Off-road driving in the earlier years was influenced by the search for the big five and resulted in enormous impacts on vegetation and animals. This has greatly declined because stakeholders have come to appreciate the role played by the environment towards ecotourism business, a fact that made 81.2% of the respondents to report that drivers expressed concern for the environment. Nevertheless, the study results indicated that some off-road driving still occurred but was confined to some portions with poor roads. By the time the study was initiated, many sections were impassable due to rainwater accumulation during the wet season. Roads in national parks and game reserves are not upgraded into excellent conditions because of the need to keep tourism areas in their most natural state. Upgrading roads to all-weather conditions has been claimed to reduce the attractiveness of some parks in South Africa and North America (Whelan. 1991). However, although maintaining the roads in their natural condition is vital for best tourism experience, it would be wise to consider the ecological status of the ecosystem in question. The Amboseli ecosystem has fine salty soils and off-road driving or creation of diversions would accelerate vegetation destruction along the curved paths while during the dry season, the powdery dust settling on the vegetation would affect their photosynthetic efficiency and palatability to animals.

In spite of the realisation of these environmental aspects, ecotourism activities in Amboseli were thought to have a future by 66.3% of the respondents. The rest felt it is likely to decline

due to environmental impacts, especially from local people's activities as witnessed in Enkong'u Narok area.

4.2.9 The trend of visitors in Amboseli over the last decade

The number of visitation records exhibited a declining trend over the last decade (Figure 4.2). High swings were witnessed around 1992-1993 and 1997. Analysis of recorded visitation figures for the period 1990-2000 showed significant differences between the years ($P<0.05$), thereby failing to hold the hypothesis that there was no significant difference in visitation records over the last decade. The major causes established for this performance according to the park management include:

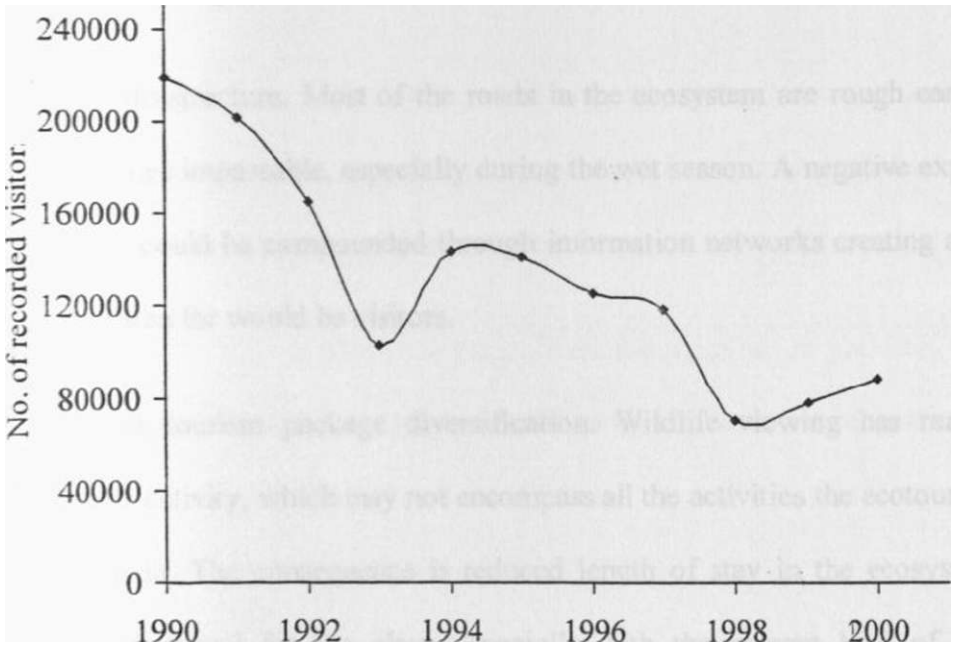

Figure 4.2: Visitor numbers in Amboseli ecosystem, 1990-2000

Source: Author. 2002

Inadequate promotion and marketing of tourism abroad. Tour companies do most of the tourism promotion when soliciting for clients. However, this was not considered effective to sustain the performance desired in this ecosystem. More active promotion would be vital for sustained visitation both to the country and the ecosystem in general.

Negative publicity of Kenya abroad due to incidences of crime and corruption.

Increased insecurity that caused a decline in visitation levels around 1992 and 1997, which was due to tribal clashes experienced in the country during these two periods.

Competition from South African countries that are developing tourism and ecotourism activities quite fast in comparison to Kenya. This makes many tourists to change their destination in preference of these southern states.

Poor infrastructure. Most of the roads in the ecosystem are rough earth roads that are sometimes impassable, especially during the wet season. A negative experience by some tourists could be compounded through information networks creating a negative picture of the area for would be visitors.

Lack of tourism package diversification. Wildlife viewing has remained the most popular activity, which may not encompass all the activities the ecotourists would like to engage in. The consequence is reduced length of stay in the ecosystem and possibly reduced appeal for the place especially with the current kind of tourists who are multifaceted in interests.

KWS policy on non-consumptive wildlife utilisation that emphasises wildlife preservation. The results have been increasing animal numbers that exceed the carrying

capacity of the ecosystem, leading to environmental quality decline that offers less for environmentally interested tourists.

- Low ploughing back of generated revenues for conservation measures. Tourism generated money is allocated by the treasury to the various parks and reserves. Most of the high revenue generating parks are sometimes denied enough allocations to effect proper conservation measures. Ploughing of less than 5% for managerial purposes was a great hindrance. Ecotourism unlike mass tourism thrive best because of the experience gained by the visitor from the environment. Extra efforts and increased financing to maintain the destination point in an attractive condition would enhance more ecotourism. It is therefore imperative for ecotourism areas in Kenya to be given an added advantage in terms of financing for conservation.

- Management goals that aimed at reducing incidences of mass tourism and promote ecotourism. This was effected through raising of entry charges whose repercussion was the reduction in number of mass tourists.

From the results, it is apparent that the park management has to put extra efforts to alleviate the declining trend of visitors by making the park more attractive, appealing and satisfying.

4.3 ANALYSIS OF THE LOCAL COMMUNITY

i

4.3.1 Demographic characteristics of the study groups

The sex and relationship of the respondent to household head varied between the groups as shown in Table 4.5. The percentage of household head responses attained the highest values. This was because most family members opted to let their household head to reveal family

information. Therefore, the information obtained is likely to be a true reflection of the ecotourism status and its contribution to the society. Response by women was a bit high in the pastoral and farming groups, for in some households, men were not encountered as they were said to be away for grazing or in employment. In the ecotourism group, they remained around the camps to market their products.

Table 4.5: Frequencies of respondent household membership in the three groups *

Respondent	Ecotourism	Pastoral	Farming
Son	1 (2.9)	5 (14.3)	3 (8.6)
Wife	5 (14.3)	12 (34.3)	11 (31.4)
Daughter	0 (0.0)	0 (0.0)	2(5.7)
Household head	29 (82.9)	18(51.4)	19(54.3)

* Figures in parentheses represent percentages

Source: Author, 2002

A household forms the primary social unit in any community. Its size varies from one household to the other, or between different groups of people within a community or communities. The mean household sizes were 10.2, 10.51 and 9.8 members in ecotourism. pastoral and farming groups respectively, and were considered to be large. Their sizes were not significantly different ($P<0.05$) between the groups, although the pastoral group attained a slightly higher mean household size than the rest two groups. The large household sizes are comparable to those of the Gogo in Tanzania (Rigby, 1969) and the Pokots of Kenya (Herlocker, 1999). They resulted from the polygamous and extended nature of the Maasai families. The largest household recorded 25 members. The driving forces behind the large families were the need for herding labour and or fanning. Khogali (1980) found that nomadic families prefer large families because they provide enough labour required to move livestock away from camps, a factor that is driven by livestock stratification needs. Moreover, Kariuki (1995), on assessing the effects of irrigation to pastoralists in Isiolo,

found that the households increased with increased farming activity due to the requirement of labour.

4.3.2 **School attendance**

School attendance in the three groups varied with each level of education under consideration, namely; university, college, secondary, primary and nursery. Higher levels of school attendance were observed in the farming group compared to the other groups (Table 4.6). No household in the sample had a family member in the university level. College level was only reported by 17.1% of the farming group families. However, primary school attendance was high in all the groups, with 85.7% in ecotourism group. 68.6% in the pastoral group and 97.1% in the farming group. This was attributed to the presence of a school in each area constructed from tourism money directly or indirectly. Moreover, some parents interviewed expressed the need for their children to acquire education in order to benefit from the school bursary programme, or obtain employment in the lodges. Therefore, ecotourism played a role in education motivation comparable to what Wearing and Larsen (1996) observed in the Santa Erena rainforest project. In the Santa Erena project, education was motivated by the need to get education for employment in the project, which was only available to high school graduates.

Table 4.6: **Household education attendants at various levels***

Group	University	College	Secondary	Primary	Nursery
Ecotourism	0 (0.0)	0 (0.0)	8 (22.9)	30 (85.7)	14(40.0)
Pastoral	0 (0.0)	0 (0.0)	3 (8.6)	24 (68.6)	8 (22.9)
Farming	0 (0.0)	6(17.1)	26 (74.3)	34(97.1)	3 (8.6)

* Figures in parentheses represent percentages

Source: Author. 2002

Pastoral households recorded lower values in almost all levels. This resulted from lack of finances, cultural practices of circumcision and early marriages, and school disruptions from wildlife that made many parents to withdraw their children from school. High dropout rate for lack of school fees was reported in limarba school (pastoral group) than in Enkong'u Narok school (ecotourism group). A total of 109, 77 and 139 school attendants were recorded in the interviewed families for the three groups respectively. A regression analysis was carried out to determine the factors influencing school attendance at the household level. The regression was based on the following function:

$Q_i=P0+P.X_{il}+p_2X_12+P3X_{i3}-\hat{}_i$

where. Q; = the number of school going children for the i^{lh} household.

Xji = chance of having benefited from school bursary by the i^{th} household

X2 = household size of the i^{h} household

X3 = number of livestock owned by the i^{th} household

6j = error term for the i^{lh} household.

po = constant

Pi_ P3 = regression coefficients

The resultant t-values in Table 4.7 show the strength of the variables in influencing the dependent variable. The higher the t-vaiue, the stronger the variable in influencing the variation of the dependent variable. The household size and the possibility of having benefited from the bursary scheme influenced the number of children attending school per household. It was negatively related to the number of livestock owned, suggesting that the larger the household herd, the higher the possibility for some children not to attend school. Children in pastoral areas provide much of the labour force required to herd livestock

(KhogalL 1980). Therefore, large household sizes ensure that herding labour is sufficient and the rest attend school.

Table 4.7: Factors influencing school attendance

Variable	Coefficient	t-value
Constant	5.79	8.76*
Household size	0.15	4.25*
Benefited from the bursarv scheme	2.44	7.72*
Number of livestock owned	-2.38	-1.01

* Significant at 5%, R" = 0.46. F=28.45», N=105

Source: Author, 2002

43.3 Income sources and expenditure

Incomes among the three groups were derived from a variety of sources. Each group received quite some substantial amount of its income from livestock keeping, supporting Galaty (1981) argument that livestock still forms the base of the Maasai livelihood. Results indicated that the pastoral group families (97.1%) depended highly on livestock, earning **92.2%** of their incomes compared to 60% of the ecotourism group families who only derived an average of 30.9% of their total income (Table 4.8). Ecotourism activities (selling curios and employment in lodges and cultural centres) earned an average of 66.1% towards the incomes of the involved families compared to an average of 1.5% realised by pastoral group households. These ecotourism activities generated more than twice the mean income earned from livestock by the ecotourism group. The total household incomes showed a higher correlation to ecotourism activities (r^2 = 0.652) and farming (r^2 = 0.657) than to livestock keeping (r^2 = 0.140). This indicates the ability of ecotourism to contribute to household livelihoods: hence reducing the reliance on livestock, supporting Mathielson and Wall (1982) that protected area tourism offers people in the neighbourhood increased alternative

financial earnings. Ecotourism related earnings in the farming group came from crop sales and employment.

The farming group indicated a higher mean income per household than the other groups because most families practised some irrigated farming that was more market than subsistence oriented. Table 4.8 gives the percentage of households deriving incomes from the various activities and the proportion of income earned.

Table 4.8: Sources **and proportions of incomes from activities engaged in***

Source	Ecotourism		Pastoral		Farming	
	%HH+	% income	%HHt	% income	%HHt	% income
Livestock	21 (60.0)	30.9	34 (97.1)	92.2	23 (65.7)	20.3
Farming	4(11.4)	2.5	3 (8.6)	4.7	31 (88.6)	52.4
Charcoal	0 (0.0)	0.0	0 (0.0)	0.0	4(11.4)	0.4
Curios	31 (88.6)	40.0	5(14.3)	1.3	0 (0.0)	0.0
Employment	6(17.1)	11.3	0 (0.0)	0.0	8 (22.9)	23.3
Handcrafts	19(54.3)	14.8	1 (2.9)	0.2	0 (0.0)	0.0
Land lease	2(5.7)	5.0	4(11.4)	1.7	0 (0.0)	0.0
Other sources	0 (0.0)	0.0	0 (0.0)	0.0	5 (14.3)	3.6

* Figures in parentheses represent percentages, t Percent households

Source: Author, 2002

Income expenditure varied by groups. The main use was in purchasing of household goods (consumables), paying for education, investing in farming and buying of more beads and jewellery to make curios (ecotourism group). Consumption of alcohol was also high among the ecotourism residents due to its availability in the nearby tourist centres. Livestock purchase was reported by 71.4%, 40% and 48.6% of ecotourism. pastoral and farming group respondents respectively. The high rate of livestock purchase by ecotourism respondents was driven by the fact that many households settled there for lack of livestock wealth, and were previously considered poor. They therefore utilised the ecotourism-generated income

to purchase livestock. This phenomenon of adding livestock amongst all groups indicates the high affinity the Maasai have for livestock. Kariuki (1995) observed that the Borana nomads of Isiolo preferred adding livestock out of their irrigation earned money to investing in other forms: for it is through livestock that they would be assured of a steady subsistence. Moreover, livestock forms a better form of wealth likely to be relied on for long unlike tourism that follows seasonal patterns year after year. It is also the only wealth one could pass on to his children. Bekure *et al.* (1991) argues that such a pattern, which is common amongst the pastoral tribes, is driven by lack of alternative forms of investment.

4.3.4 Livestock ownership

Livestock owned were of different categories (cattle, sheep, goats, chicken and donkeys), which is a common practice among the pastoralists (Homewood and Rodgers. 1991). The total number of animals owned showed significant differences ($P<0.05$) between the groups. Tukey's test indicated that the pastoral group owned more livestock numbers of each category except for chicken. Chicken were only recorded in some farming group households for they could sell eggs in the nearby shops and eating-places. The other groups did not rear them because of cultural beliefs.

The mean numbers of livestock owned are given in Table 4.9 while ranges of livestock ownership in classes of hundreds are shown in Table 4.10. The pastoral group recorded a higher number of households with more than 100 animals. It also exhibited higher animal sales per household than the rest of the groups (Table 4.11). Majority of the households in ecotourism and farming groups owned less than 100 animals. The high livestock numbers

ownership by the pastoral group provided the means to buy grains, educate the children or get enough milk for consumption since they had no other major source of income like their counterparts in ecotourism or farming. Correlation analysis showed negative relationship between number of livestock owned and household incomes (r^2 = -0.320), implying that livestock accumulation was necessitated by lack of alternative income sources for household subsistence. Hjort (1980) argues that large herds are essential in supplying the caloric needs of the nomadic families. This is because the nomadic pastoralists are mostly isolated from cash economies (Eckholm, 1975).

Table 4.9: **Mean number of livestock owned by the groups**

Group	Cattle	Goats	Sheep	Chicken	Donkeys	Total
Ecotourism	36.31	29.26	19.31	0.00	3.09	87.97
Pastoral	59.17	41.00	22.60	0.00	5.09	127.86
Farmine	27.97	21.51	11.31	2.69	0.86	64.34

Source: Author, 2002

Table 4.10: Ranges of livestock ownership by household group*

Livestock numbers	Ecotourism group	Pastoral group	Farming group
<100	20 (57.1)	15 (42.9)	28 (80.0)
100-200	14 (40.0)	12(34.3)	7 (20.0)
>200	1 (2.9)	8 (22.9)	0 (0.0)

* Figures in parentheses represent percentages

Source: Author, 2002

Table 4.11: Mean number of each livestock category sold

Group	Cattle	sheep	Goats	Total
Ecotourism	1.34	0.46	0.94	2.74
Pastoral	2.94	1.40	3.80	8.14,
Farming	1.49	0.46	1.54	3.49

Source: Author. 2002

A regression analysis was carried out to determine factors influencing livestock sales. The regression was based on the following equation:

$Q_l = Po+p,x_i,+p_2x_i2+Mi3+ £|$

where, Q, = number of livestock sold for the i^{h} household

Xji = need to pay for education for the i^{lh} household

X,2 = livestock keeping as the main source of livelihood by the i^{h} household

Xj3 = number of people employed in tourism sector in the i^{th} household

£j = error term for the i^{h} household

Po — constant

P3 = regression coefficients

The results indicated that the number of livestock sold at the household level was influenced by the need to raise money for education, possibility of not having a family member employed in tourism sector and mostly by the reliance on livestock as the main source of livelihood (Table 4.12). Therefore, disposal of livestock to market was mostly influenced by a particular need, which holds to the argument that pastoralists do not part with their cattle unless under certain conditions. Selling of livestock was observed mostly in the pastoral households who had fewer sources of incomes and had to educate their children as well as meet their daily needs. The t-values show the strength of the independent variable in influencing the variation of the dependent variable.

Table **4.12: Factors influencing the number of livestock sold at household level**

Variable	Coefficient	t-vaiue
Constant	-3.75	***-2.61****
Need to pay school fees	2.85	3.76*
Livestock keeping as the main activity	1.69	10.65*
No familv member enroloved in tourism	1.24	1.97*

* Significant at 5%, R" = 0.59. F = 48.00*

Source: Author. 2002

In spite of the fact that the pastoral group owned higher livestock numbers, the ecotourism households attained a higher rate of animal purchase (71.4%) from the tourism money. This enabled 20% of the households to attain an increasing livestock trend unlike other groups that reported a declining trend over the past five years. Livestock addition was also driven by lack of hope for the future contribution of ecotourism to livelihood maintenance since the returns were declining rather than increasing with time. Information from respondents and opinion leaders revealed that ecotourism had not lived to the people's expectations despite offering competition for the resources. They thus viewed livestock keeping as the solution to their future survival. Hopcraft (1980) and Sandford (1983) argue that pastoralists increase their livestock not out of irrationality, but in efforts to increase their individual gains from common resources.

Over 70% of the respondents in each group reported to have experienced a declining livestock trend over the past five years. Several factors were identified for this (Table 4.13). Ecotourism activities affected the number of livestock owned by increasing competition for pastures, transmission of diseases and predation from wildlife. However, to some respondents in ecotourism. these costs were not equivalent to the benefits derived. Ecotourism provided an alternative source of income to purchase household goods and pay for school fees, reducing the reliance on livestock (Table 4.13). Asked whether they would increase their livestock could tourism be wiped out of the region, 40%, 57.1% and 80% of ecotourism, pastoral and farming group respondents respectively felt they would automatically do it. Majority of the ecotourism group respondents (60%) felt that their livelihoods would be affected because tourism assists them in adding their stock and meeting their daily needs. Without ecotourism. they would destock in efforts to maintain

their households. The other two groups viewed ecotourism activities to have taken vast land with high potential for grazing, i.e. the park with most of the water points.

Table 4.13: Reasons for declining livestock numbers*

Cause of decline	Ecotourism	Pastoral	Farming
Lack of pastures due to competition	20 (57.1)	26 (74.3)	22 (62.9)
Predation and diseases	23 (65.7)	26 (74.3)	25 (71.4)
Drought	22 (62.9)	28 (80.0)	15(42.9)
Sold to buy household goods	10(28.6)	14(40.0)	7 (20.0)
Sold to pay school fees	2(5.7)	11 (31.4)	26 (74.3)
Sold to get money for farming	5(14.3)	5(14. 3)	26 (74.3)

* Figures in parentheses represent percentages

Source: Author, 2002

43.5 Employment opportunities

Ecotourism or tourism existence creates jobs for the local people. Job opportunities were created in KWS, in campsites and lodges, and in the cultural manyattas. Among the ecotourism. pastoral and farming group families. 40%, 17.1% and 31.4% of the respondents respectively indicated having at least one family member employed in the sector. The most common job opportunities were of low status due to lack of technical skills. These included cultural dancing, car cleaning, cooking, gardening, security, laundry work and tour guiding. Previously, job opportunities for game scouts were common in the ranch and facilitated the protection of animals from poaching or any other form of destruction. However, this was discontinued because of financial limitations. This generated increased hostility towards wildlife, increasing incidences of wildlife spearing around homesteads and water points.

4.3.6 Poaching trend

Poaching activities are common where local people lack the sense of animal ownership. Results indicated that poaching was rare, and was only carried out by outsiders when it happened. It was rather common in the 1980's when animals were viewed as state property. To most respondents, poaching had either declined or was non-existent. This was attributed to the role of game scouts during the early 1990's after the introduction of active ecotourism and benefit sharing (Table 4.14). The local people gave information to KWS on animal harassment or killing for they held high benefit expectations from ecotourism. Moreover, their cultural practices that promoted animal killing were slowly getting abandoned, adopting an advocacy for conservation. Moss (1988) further attributed this to their traditions, which are pro-conservatism. Although this could have contained the harassment or poaching of animals as happened in Nazinga project in Burkina Faso (Kiss, 1990), the case was reversing in the last few years, taking an upward trend. This was attributed to the sacking of game scouts, derivation of low benefits, and conflicts around water points or around farms and bomas (Moss, personal communication).

Table 4.14: Trend of poaching according to the local people*

Group	Declined	Remained constant	Does not occur
Ecotourism	11 (31.4)	2(5.7)	22 (62.9)
Pastoral	21 (60.0)	0 (0.0)	14 (40.0)
Farming	7 (20.0)	0 (0.0)	28 (80.0)

* Figures in parentheses represent percentages

Source: Author. 2002

4.3.7 Wildlife ownership and utilisation

Effective ecotourism coupled with derived benefits by the local people creates the will to live with wildlife through change of attitude (Johnstone, 1999; Ceballos, 1992). Over 80% of the respondents in each group were willing to accommodate tourism on their land as they expected it to generate more benefits. This implies that the ranch land still has a high potential for tourism. However, the current situation differed. Tolerance for wild animals was indicated by 62.9% of the ecotourism group, 65.7% of the farming group and 28.6% of the pastoral respondents. Families in the farming and ecotourism groups derive a diversity of benefits, e.g. market for artefacts and farm produce, source of employment and benefits from the bursary scheme. Majority of the pastoral group (71.4%) expressed a negative attitude to wildlife conservation and existence of tourism in their ranch. This is because they viewed their gains from wildlife as low while costs are high. A regression analysis to determine the influencing factors on the will to accommodate wildlife showed the results in Table 4.15. The regression was based on the following equation:

$$Q_i = P_0 + P_1 X_{j1} + P_2 X_{i2} + P_3 X_{i3} + p_4 x_{i4} + p_5 x_{j5} + P_6 x_{i6} + P_7 x_{i7} + S_i$$

where. Q_t = the will to accommodate wildlife by the i^{th} household

X_{i1} = a member of the i^{th} household being employed in tourism sector

X_{i2} = getting water as an ecotourism benefit by the i^{th} household

X_{j3} = benefit of school bursary by the i^{th} household

X_{i4} = experience of school disruptions from wildlife

X_{j5} = income from ecotourism activities received by the i^{th} household

X_{i6} = involvement in decision-making on the benefits from wildlife conservation

x_{i7} = need to maintain tourism industry

£; = error term for the i^{lh} household

Po = constant

Pi_ P7= regression coefficients

The results indicated that the will to accommodate wildlife was driven by the benefits received from ecotourism activities such as water from boreholes, school bursary provided from KWS compensation money and the chance of a household member being employed in tourism. Moreover, the support was high because of the view that these benefits can only be realised if wildlife tourism is maintained. Incomes from ecotourism activities though positive for influencing the support for accommodating wildlife were not significant because most households received little or nothing in monetary terms, but gained social benefits from wildlife supported ecotourism

Table 4.15: **Factors influencing the will to accommodate wildlife**

Variable	Coefficient	t-value
Constant	0.30	0.96
Family member employed in tourism sector	0.25	2.78*
Water as benefit from ecotourism	0.20	2.32*
Experience of school disruptions from wildlife	-0.15	-1.73
Benefits of school bursary	0.12	2.62*
Involvement in decision-making on type of benefits to acquire from wildlife conservation	0.96	1.67
Need to maintain tourism	0.26 ,	5.50*
Incomes from ecotourism activities	1.02	0.64

Significant at 5%, R' = 0.41, F = 9.69*, N = 105

Source: Author. 2002

According to the pastoral families, elephants and carnivores are regarded as enemies in their neighbourhood since they cause a lot of disturbances to people and livestock. Most

respondents proposed that such animals be confined to the parks to reduce these costs. Stiles (1990) argue that effective survival of wildlife in Africa in most cases depends on the people's attitudes, which largely depends upon the practical consideration of making a living out of the wildlife. The negative attitudes expressed by the pastoral group stem when people are forced or made to face menace from resources they are required by the law to conserve. Moss (1988) attributed the hostility to wildlife in Amboseli as a result of delayed compensation, or shear lack of it, for the losses incurred through diseases and predation. The sense of ownership of the resources by the local residents and the power to regulate their use also influence the will to conserve because ownership instils some pride among the resource keepers (Boshe, 1985). The results indicated that there were varying opinions over the ownership of these resources as indicated in Table 4.16.

Table **4.16: Wildlife ownership as perceived** by **the local people***

Ownership	Ecotourism	Pastoral	Farming
Local communitv	1 (2.9)	6(17.1)	0 (.0.0)
KWS	12 (34.3)	18(51.4)	18(51.4)
State	10(28.6)	5(14.3)	1 (2.9)
KWS and the local communitv	12 (34.3)	6(17.1)	16(45.7)

* Figures in parentheses represent percentages

Source: Author. 2002

The results in Table 4.16 indicate that the ecotourism and farming groups held a high sense of wildlife ownership than the pastoral group. This is by considering the response on the joint ownership by KWS and the community. Nevertheless, the opinion of local ownership was generally low in all groups: the main reason being that they were not given the mandate over the control of the resources while the benefits were considered inadequate. This is comparable to the case of the windfall programme in Zimbabwe (Murindagomo, 1990)

where local people viewed wildlife as state property rather than that of community because they received meagre returns from the wildlife compared to the generated amounts.

Wildlife tolerance could also be affected by the way the resource is put into use for maximum gain by the society. Wildlife utilisation is either consumptive or non-consumptive. In Amboseli, wildlife viewing, which is non-consumptive is the major form of utilisation. While the debate to introduce other consumptive uses continues in the country, 68.6%, 80% and 68.6% of the ecotourism. pastoral and farming groups, respectively, supported non-consumptive use of wildlife for ecotourism purposes rather than consumptive uses (sport hunting, game cropping or home consumption). This suggests that ecotourism as a form of wildlife utilisation does not conflict with the will of the local people on the use of their ancestral resource. In fact, it aids in the conservation of a resource that has been part of their culture.

4.3.8 **Comparison of ecotourism with other land use options**

For ecotourism to be an effective land use option and a conservation strategy, it should contribute to the peoples' well being by raising an extra income for the households. Results indicated that 91.4%, 77.1% and 80% of ecotourism. pastoral and farming group respondents, respectively, had the opinion that ecotourism couid be a viable activity for them if well managed. Hence, they indicated that it would be wise for the society to support it. However, by assessing the current returns or the performance of ecotourism land use to their daily livelihoods, a majority of respondents involved in ecotourism (68.6%) rated it a more valuable activity than any other land use. The pastoral (45.7%) and farming (71.4%)

group respondents rated it as a less valuable activity (Table 4.17). Some pastoral group respondents (25.7%) considered it a low value activity due to its seasonality, creation of dependency and being associated with poverty and corruption.

Table 4.17: The rating (%) of ecotourism in relation to land uses among the groups*

Rating	Ecotourism group	Pastoral group	Farming group
More valuable	24 (68.6)	6(17.1)	0 (0.0)
Less valuable	4(11.4)	16(45.7)	25 (71.4)
Just as others	7(20.0)	4(11.4)	10(28.6)
Non-valuable	0 (0.0)	9(25.7)	0 (0.0)

* Figures in parentheses represent percentages

Source: Author, 2002

The results implies that ecotourism as a land use option was not fully accepted by the majority of the local people in order to make conservation a viable land use option as initially aimed. This is because of the low tangible benefits acquired at the household level. To make it more competitive, it would require the development of a mechanism to increase returns at the household level. Otherwise, wildlife management will remain unprofitable when compared to other land uses, such as livestock keeping and agriculture, in the maintenance of day-to-day life.

43.9 **Local participation**

Local participation in ecotourism practice is important, as the local people remain the most familiar with wildlife resources. They are also well informed about the effective means of conservation. In addition, they bear most of the costs of conservation, such as attacks from animals and loss of land, among others (Henry, 1976; Barbier *et al,,* 1990). Participation allows them lo have a chance to effectively benefit from conservation efforts by being

incorporated as partners. Only 5.7% and 8.6% of the ecotourism and pastoral groups respondents reported that local participation was solicited by KWS in decision-making on wildlife use. Furthermore, participation in decision-making on protected area management and in allocation of benefits for tolerating wildlife only involves leaders, as reported by 54.3% of the ecotourism and pastoral groups each and 40% of the farming group. This made them feel marginalised as far as decision-making was concerned. Barbier *et al.* (1990) argue that under such conditions, incidences of being unsupportive to conservation efforts are likely to crop up, resulting in hostility to conservation efforts that are viewed as impositions from outside.

Participation by tour operators was not common either. Even the tour operators operating under the leased Kitirua land only involved group leadership in signing of agreements and planning for the benefits. The 'common man' played no role, nor was he informed of the happenings. The tour companies also played no major role in the local people's livelihoods. It would be expected that these companies would give local people priority in employment, but it was not the case. The only contribution acknowledged was in provision of building materials by one tour company towards the construction of Enkong'u Narok school. Barrow (1997) pointed out that such situations are common even where leases are entered into with the hope of alleviating the standards of the local residents. This mostly happens because tour companies lack the time and expertise to do enough consultations with the local people who own the resources. They only involve the community leadership with the hope that there would be a trickling down effect of benefits to all. However, the results in most cases are benefit accumulation to just a few individuals. For the lodge operators, they involved the local people mainly through employment. Information revealed that they give priority to

local labour as a way of enhancing local participation, creating a harmonious coexistence and helping to increase conservation awareness. One lodge and a tented camp went further to provide water, contributed to school development and provided training attachments for those pursuing hotel related courses.

According to Koikai (1997), the preference by some stakeholders to collaborate with group ranch leadership rather than the majority remain the greatest drawback to all conservation initiatives by Non-Governmental Organisations (NGOs), government sectors and individuals. The local leaders are taken to mean the society, but this does not serve the purpose. This shows that the KWS goal of using ecotourism to involve local people as partners in conservation has not been fully achieved. The effective way would probably be the formation of village advisory committees to work hand in hand with group ranch committee, so as to involve people at all levels through information sharing and decision-making. Although KWS may view the benefit sharing and the employment policy to imply involvement, the solution may be in participatory involvement, as argued by Toloumbaye (1994), rather than just financial gain. Local participation is needed from problem identification, implementation, monitoring and evaluation if success in ecotourism has to be achieved.

4.3.10 Ecotourism benefits and costs [1]

Benefits in ecotourism and tourism areas are diverse and differ in magnitude depending on the level of contact the community comes into with tourism activities. In most cases, benefits are realised in form of employment, market for products, development projects or

improved services that are directly or indirectly intended for the local people. Table (4.18) shows the benefits received by the three groups.

Table **4.18: Benefits realised by the community from ecotourism***

Benefit	Households in ecotourism	Households in pastoralism	Households in farming
School	31 (91.4)	22 (62.9)	20 (57.1)
Water	27 (77.1)	16 (45.7)	0 (0.0)
Improved communications	5(17.1)	3 (8.6)	0 (0.0)
Improved roads	2(5.7)	0 (0.0)	14(40.0)
Hospital/clinic	4(11.4)	13(37.1)	0 (0.0)
School bursary	34 (97.1)	33 (94.3)	34 (97.1)
Cash money	27(77.1)	2(5.7)	7 (20.0)
Employment	14(40.0)	6(17.1)	11 (31.4)
Market for farm produce	3 (8.6)	0 (0.0)	24 (68.6)
Money and employment from land leasing	6(17.1)	7 (20.0)	10(28.0)

* Figures in parentheses represent percentages

Source: Author, 2002

Schools and school bursaries were among the highly acknowledged benefits among the groups. Each area had a school constructed from tourism money, while the KWS compensation money was mainly used for the school bursary scheme. Water also ranked high for households in ecotourism and pastoral groups due to the existence of bore-holes previously maintained by KWS for the benefit of the local people, their livestock and wildlife. The farming group households relied mostly from spring water for they occupied a wetter section of the ranch. Communication, employment and generation of money from land leasing were the lowest reported benefits. This is due to the distance covered to get the communication services in the park, while land-leasing benefits were only realised by a few.

Cattle dips existed in the pastoral and farming areas but none in the ecotourism area. In spite of a road network in the group ranch connecting several points, roads were only acknowledged by 40% of the farming group. They used them to facilitate the marketing of farm produce. This supports the findings by Homewood and Rodgers (1991) on the effects of tourism in Ngorongoro area that the local people used the rim road to the crater as an important avenue for marketing livestock and grains. Health clinics were found in the lodges and at the park headquarters community centre. However, only 37.1% of the pastoral group respondents considered them as benefits. Despite that the group involved in ecotourism acquired health services from the lodges, they did not consider them as benefits for they were acquired at a cost. Cash money and employment from tourism activities on the other hand were highly ranked in the ecotourism group than in other groups. Furthermore, small businesses of shops and eating-places operating in Enkong'u Narok area availed household items previously obtained from far places. Some lodges reported to get their supplies (cabbages, tomatoes and chillies among others) from the local farmers, thereby providing a market for the farm produce for some farming households.

From these results, it is evident that each group had a set of benefits from ecotourism although unevenly distributed over space. It is conclusive therefore that the hypothesis of uniform distribution of benefits in ail areas though descriptive in nature did not hold. The benefits were mostly of social projects apart from the cash received through the sale of farm produce and artefacts, or employment. Kibasa (1998), on evaluating ecotourism benefits around Lake Manyara in Tanzania, also found that most benefits to the people were of social projects. However, for the Amboseli area, the social benefits were termed inadequate by the local dwellers for they did not fulfil their expectations.

Costs to societies from ecotourism or tourism depend on several factors. These include the level of contact the people come into with realities of tourism that may sometimes lead to loss of traditional resources (Rosenfeld *et al.,* 1999; Wearing and Neil, 1999 and Lusigi, 1981), location, species of animal encountered and peoples' lifestyle (Kagwana. 1993). Based on the results, the costs incurred related to human-wildlife conflicts and the social-cultural breakdown. Human-wildlife conflicts stem from the direct conflict between man and wildlife (Makopodo, 1994). The conflicts in the current study resulted from changes in land use. encroachment on wildlife areas due to the high human population pressure, settlement along the animal corridors (in Enkong'u Narok) and the provision of water that caused a concentration of both domestic and wild animals. The major costs incurred included the loss of human life and injuries, livestock predation and injuries, animal diseases, competition for water and pastures between domestic livestock and wildlife, and school disruptions (Table 4.19).

Table 4.19: **Main costs incurred from wildlife**

Cost	Households in ecotourism		Households in pastoralism		Households in farming	
	%	rank	%	rank	%	rank
Human life loss	71.4	5	68.6	6	37.1	7
Livestock killing and injuries	100.0	1	100.0	1	80.0	3
Crop damage	5.7	8	11.4	8	94.3	1
Diseases transmission	85.7	4	68.6	6	85.7	2
Competition for pasture	94.3	3	91.4	2	77.1	4
Competition for water	71.4	5	82.9	5	71.4	5
School disruptions	45.7	7	91.4	2	11.4	8
Human injuries	97.1	2	88.6	4	68.6	6

Source: Author. 2002

School disruptions were low in the ecotourism (45.7%) and the farming groups (11.4%), but high among the pastoral group residents (91.4%). The school was located near a bore-hole, and whenever the bore-hole was operational, disruptions by wildlife increased, affecting the school enrolment rate. Crop damage ranked high among the farming group respondents (94.3%) because wild animals (elephants, monkeys, buffaloes and gazelles among others) cause damage to maize, tomatoes, onions, beans and vegetables despite the erection of an electric fence. To bear such costs, communities look for remedies from the concerned authorities. The remedies to the costs included: the benefit sharing (to compensate for pastures and water competition), consolation fee from the elephant group for livestock killed by elephants, elimination of rogue animals, scaring away of animals and construction of animal barriers (electric fences). Governments' compensation is only restricted to human deaths but the compensation process is characterised by delays and meagre amounts of only KShs. 30.000.

The elephant consolation fee scheme was initiated to compensate for livestock only killed by elephants as a way of enhancing elephants' conservation. Over the last four years, the number of consoled cases are as given in Table 4.20. The consolation was recognised as a form of benefit or compensation by 65.7%. 48.6% and 42.9% of the ecotourism. pastoral and farming group respondents respectively. The high number of cases in year 2000 was caused by the severe drought experienced that increased the incidences of contact between elephants and domestics in areas of pasture and water.

Table 4.20: The number and kind of livestock consoled from elephant deaths

Year	Cows	Goats	Sheep
1997	4	2	1
1998	0	0	1
1999	1	2	1
2000	25	2	0

Source: KWS (2000)

Other costs related to the loss of traditional grazing land, watering points and natural salt licks to what is now the park where some of the ecotourism activities take place. This justifies their earlier argument that they would increase their livestock numbers would tourism be wiped out of the ecosystem. To them, the park is vast land with great grazing potential because of water resources, but inaccessible to them. In addition, the creation of the national park imposed restrictions to the earlier free movement of livestock and human beings across the ecosystem. In the social-cultural context, the major costs incurred related to disruption of the customs that governed the use of resources, and the introduction of practices that are contrary to their morals. These were mainly reported at Enkong'u Narok. They included:

- Disruption of their traditional gender roles. According to the Maasai. the "morans" were the community's soldiers who moved livestock to the dry season grazing zones. The starting of ecotourism activities resulted in creation of employment opportunities and most morans became engaged as cultural dancers in the cultural manyattas or in the lodges. This deprived the pastoral sector of its most vital herding labour, resulting in reduced mobility. The consequences are increased overgrazing around the settlement.

- Breakdown of the social responsibility in the protection of natural resources, such as trees. According to the Maasai culture, no one was allowed to cut trees aimlessly

because their lives depended upon such natural resources. However, in the recent times, cutting trees does happen. This is common around the settled area due to the need for building bomas and enclosures.

- Breakdown of the mobility pattern due to the need to be near tourism centres for employment and selling of artefacts. Most participants gain from ecotourism activities mostly from sale of products but not from cultural centres entry fees. This is due to the competition amongst the cultural centres and lack of proper organisation to manage the operation of the centres. The implication has been reduced entry charges that are not beneficial to many. One has to be close to the camps all the time to sell one's products. The repercussion has been reduced mobility even during the time of the year when movement used to take place to other areas in search of pasture.

- Introduction of anti-social practices out of the need to gain money, or idleness during the low tourism season time. These include prostitution, breakdown of marriages, idleness, alcoholism and incidences of theft. In addition, is the influx of immigrants either for employment or for business, which was not common before the starting of ecotourism.

Deprivation of herding labour and reduced mobility were of great consequence. Mobility among pastoral people ensures sustainable resource use for it gives them time for regeneration. However, settling to participate in ecotourism and associated activities disrupted this arrangement, a reality they will have to cope with. Hjort (1980) argues that the current pastoralists are competing with the modern sector characterised by irrigation farming, tourism and wildlife management, which the pastoralists support by providing wage labour in return for a means of subsistence. Although this is rational for survival, the pastoral sector suffers by losing members of its own labour force, who are vital in the

maintenance of proper livestock husbandry practices. The consequences are overgrazing with its negative effects on the vegetation composition and richness, a situation Pratt and Gwynne (1977) classified as a major problem facing the African rangelands.

In conclusion, the ecotourism activities have both positive and negative aspects to the host community. These aspects are of social nature. Most of them do not have or cannot be given a vaiue at the household level, e.g. the costs of an injured animal, competition for pasture and water, animal diseases treated using herbal medicine instead of conventional medicine or school disruptions. Also classified in the same criterion are benefits such as roads, communication, or other social services. An exhaustive cost-benefit analysis of ecotourism was therefore not possible.

43.11 Ecological integrity of Amboseli ecosystem

Amboseli ecosystem was reported by the community members to have undergone environmental change. Over 80% of the respondents in the three groups reported having observed some change (degradation or improvement). It was attributed to past and current events of ecotourism. farming and climatic effects such as drought. Environmental improvement was reported by 8.6%, 28.7% and 14.3% of the ecotourism, pastoral and farming groups' respondents respectively. However, degradation was recognised by 74.4%, 57.1% and 71.4% of the ecotourism, pastoral and farming respondents, respectively. Degradation was claimed to result mostly from overgrazing and woody vegetation destruction.

Environmental degradation started upon the establishment of tourism activities and the alienation of the Maasai from their dry season grazing fields. This concentrated them with their livestock in the drier parts of the ecosystem. Attempts to supply water through bore-holes reduced the movement patterns and encouraged concentration of animals, leading to overgrazing and subsequent degradation around the points they were located. More to the large livestock numbers are the increasing populations of wild animals preserved for tourism. This makes conservation and human activities responsible for the increased overgrazing, debarking and knocking down of trees, and opening the ecosystem towards grassland.

Soon after the creation of the national park, tourist facilities started coming up, which increased the demand to provide more food. The natural forests in the wetter areas were opened for cultivation, resulting in sedenterisation, reduced mobility patterns and grazing areas that accelerated the degradation of the surrounding sites. The last two decades of intense ecotourism activities have not improved the situation either. Settlement for participation in ecotourism activities started at Enkong'u Narok and areas next to the park's main gates. The repercussions were deforestation, littering from domestic refuse around settlements, vegetation trampling and destruction, off-road driving, animal displacement from their original grazing fields, overgrazing, obsruction of the animal corridor through settlements, pollution of swamps, and over-collection of dead wood materials for fuel. Off-road driving, although on the decline in the park, has remained high around the cultural centres and in Kitirua area used for game drive.

Deforestation is high around the settled area. Some of the highly affected plant species include *Acacia* species. *Lycium* species, and *Balanites* species. The main causes were

highlighted as harvesting for carving (68.6%), harvesting to build bomas and make enclosures (85.7%), and firewood (62.9%). Overgrazing on the other hand reduced the main perennial grasses (*Pennisetum meiianum, Cenchrus ciliaris* and *Chloris roxyburghiana* among others) resulting in an increase of annual grasses and unpalatable *Cyathura* species. According to Lusigi (1981), such a scenario indicates the mismanagement of the grazing resources. It resulted from the retention of animals for long periods of the year around the camps to allow for participation in tourism trade, and compounded by continued livestock addition from income generated from ecotourism.

The over-collection of dead wood was necessitated by the need to supplement the energy sources in the lodges and for use by local residents. This affects the environmental roles of such materials. Dead wood materials are important in nutrient cycling and in providing shelter for micro-organisms vital in soil processes (Othoche, 1999; Nair, 1984). Because of their deep rooting systems, trees get nutrients from deep within the soil, placing them onto the top layer through dead organic matter, thereby supplying the shallow rooted plants (e.g. grasses) with nutrients (Nair. 1984). Although this may take a long time, the big trees usually hold a lot of potential organic matter, which acts as the source of nitrogen, maintains the soil structure, retains the water holding capacity, increases the resistance to erosion and provides much of the cation exchange capacity. Therefore, the excessive use of trees and shrubs (as was in Enkong'u Narok) causes the reduction in the size of the nutrient pool because of the removal of twigs and branches with high nutrient concentration (Earnest and Tolma. 1991). It should then be understood that the over-collection of dead wood materials and harvesting of vegetation are likely to affect the nutrient cycling patterns played by wood in such an ecosystem.

When environmental resources are disturbed and at risk, the society is expected to take measures to reverse or improve the condition. Results indicated that less was done to address this (Table 4.21), except for some restriction on use of trees in the pastoral and farming groups. Lack of restrictions in utilisation of vegetation in the ecotourism group was blamed for the wanton vegetation destruction. Moreover, issues of alleviating the overgrazing problem were not properly dealt with.

Table **4.21: Measures to rectify environmental problems***

Prevention measure adopted	Households in ecotourism	Households in pastoralism	Households in farming
Do nothing about it	24 (68.6)	13(37.1)	2(5.7)
Restriction on use of trees	5(14.3)	18(52.9)	25 (71.4)
Avoid overgrazing	6(17.1)	15 (42.9)	13(37.1)
Protection of wet areas	0 (0.0)	0 (0.0)	6(17.1)

* Figures in parentheses represent percentages
Source: Author. 2002

Discussions revealed that most local residents think that tourists are only interested in wild animals and people but not in vegetation; hence they care less about it. This reflected the low level of environmental awareness amongst the local people. Effective environmental awareness through education programmes and land rehabilitation are necessary. Otherwise, the continued over use of resources and overgrazing are likely to result in what Hardin (1968) termed the tragedy of the commons.

Ecotourism activities positively facilitated the increase of wild animals, especially those previously under threat of decline. Elephants, lions, buffaloes, hyenas, zebras and wildebeests were among the highly reported cases. The major reasons behind the reported cases were their importance as prime tourist attractions and the KWS rules that prohibit poaching activities and cultural wildlife uses (Table 4.22). This supports the findings of

Othoche (1999) that tourism enhances the conservation of threatened wild species. However, this preservation also resulted from fear of being prosecuted rather than by effective realisation of benefits.

Table 4.22: Reasons behind the wild animals increasing trend*

Cause of increase	Households in ecotourism	Households in pastoralism	Households in farming
Habitat conservation	9 (25.7)	11 (31.4)	16(45.7)
KWS restrictions	21 (60.0)	25 (71.4)	29 (82.9)
Importance in tourism	30 (85.7)	29 (82.9)	29 (82.9)
Lack of hunting	8 (22.9)	0 (0.0)	5(14.3)

* Figures in parentheses represent percentages

Source: Author, 2002

4.3.12 Constraints to community ecotourism enterprises

There are many challenges facing ecotourism development in many parts of the world, as elaborated by Weaver (1998) and Makopodo (1994). However, there are specific problems for specific locations. Information from the local residents and stakeholders revealed that the major constraints stem from:

- Leadership wrangles based on clans that subdivide the people, offering stiff competition even in ecotourism activities while maintaining corrupt leaders in power for long. This makes the realisation of benefits from such ventures by the ordinary members quite difficult.

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- Inequitable distribution of benefits. Benefits from KWS. campsite and land leasing were not properly accounted for and did not trickle down to each and every one. This was confirmed by the response of over 70% in each group that classified it as a major problem facing ecotourism development in the group ranch. This hinders the acceptance

of ecotourism as a land use option because the benefits are not effectively realised at the household level.

- Lack of finances to carry out community ecotourism enterprises effectively. The community involved is poor and cannot afford to raise the heavy amounts required for investment in ecotourism enterprises. Instead they rely on leasing the land and low investment activities that are not likely to generate a lot of returns. The main cause is lack of a national policy framework to facilitate offering of credit to communities to run ecotourism. They have to rely on outsiders for financial assistance, especially from NGOs.

- Lack of proper involvement or participation. Stakeholders such as KWS, NGOs and tour-operators mainly involve leaders in their decision-making without a follow-up to find how it bears on the common people. Most respondents felt left out tor they lacked the avenue of making their contribution on how to run the ecotourism ventures. Moreover, information from deliberations on ecotourism meetings and forums does not reach everyone.

- Lack of managerial skills to operate ecotourism enterprises effectively. The leaders and those appointed by them to run the enterprises lack proper managerial skills vital for running the ventures as businesses. For example, the campsite was operated without effective management, and no records were kept to assess itfc growth in terms of visitor numbers or revenue generation over the years. This made it hard to analyse and conclude whether the venture is making profit or not. This situation also exists in the cultural centres where only the chairman and treasurer were informed about the money

transactions. There is need to engage skilled manpower or offer some training to the managers on relevant skills, such as book keeping, if the projects have to succeed.

- Lack of transparency and accountability with respect to income generation, use of funds and signing of agreements. Agreements were being entered without the consent of all, while the derived benefits accrue to a few individuals who are in leadership or in well-connected positions. Most other group members are unaware or only have vague ideas about the benefits or terms of such leases.

- Ignorance of the people about what was happening and what their role in ecotourism development ought to be. Many of them pegged their hope for ecotourism progress on their leaders without questioning, an opportunity that those entrusted with the responsibilities took advantage unduly.

- Poor marketing of community projects. Most community projects are poorly marketed and rely on the goodwill of lodge and tour operators. Poor liaison with other stakeholders limited their progress. There is need to broaden their scopc of operation and to be marketed on a broader scale beyond the ecosystem boundaries.

- Competition from lodges. While the cultural centres are supposed to sell the local people's cultures and products for their benefit, they faced stiff competition from lodges that offered similar services. For example, local residents were hired to dance and to offer cultural talks in lodges, a situation that limited the number of visitors going to cultural centres. Artefacts too are sold in lodge curio shops, offering competition to those offered by the residents. There is need to apportion responsibilities between the parties

involved to give community projects some advantage of what they can do best for them to thrive.

- Lack of effective organisation among the cultural centres. Cultural centres were supposed to benefit all people who were members by generating incomes from entry fees, cultural shows and sale of goods. However, the lack of an effective body to reguiate their working was a serious problem. They competed against cach other to the extent of lowering their entry charges to levels that were non-beneficial. Income generation was only restricted to sale of artefacts. Competition also led to mushrooming of several centres that compounded the already existing problem.

- Domination by tour-drivers. Most visitors get to the cultural centres by the will of tour-drivers. Tour-drivers in turn take the advantage and exploit the local people by getting the bigger share of the entry charges, so that they can agree to make a comeback. This is because the cultural centres lack a proper marketing system. Marketing of the community projects by the Kenya Tourism Board and tour operators would save them from unnecessary exploitation for they would be in the visitors' trip plan, rather than being directed by the drivers. Othoche (1999) made a similar observation in western Kenya where curio dealers were highly exploited by the tour agents by demanding a certain portion of the earnings in order to keep a steady supply of customers to the businesses. The results were the domination of curio businesses by the tour agents. facing out the local traders.

- Meagre benefits from tourism. Although Amboseli remains one of the highly visited parks in Kenya, and one of the earliest to adopt the local participation strategy, most respondents (over 60% in each group) felt they received too little in comparison to the

generated revenues. The 25% share of the gate fees agreed by K.WS applied no more, and currently they are only entitled to compensation amount. Over the past few years, the six group ranches (Olgulului, Mbirikani, Kimana, Rombo, Kuku and Enselengei) used to earn approximately six million annually, but this was reduced in the year 2000. Comparing the gross revenues generated for the year 2000 and the amount that was ploughed back for community compensation, it approximated 2.72%, with Olgulului ranch earning 0.52% of the year's gross returns. Such returns are rather little for people who have to live with and bear the costs of wildlife. The 2.72% earned by the ranches compares favourably with the 1.6% of the gross earnings received by the group ranches in Maasai Mara in 1989 (Griffith, 1996). In fact, Enghoff (1990) argues that tourism revenues in East Africa only have a low flow-back to communities living with wildlife. This limits the acceptance of tourism as a land use.

- Non-effective flow of tourism benefits to affected communities. Since the agreement between the government and local people for the creation of the park, the county council has been the linking bridge for development in these areas. The results were non-effective developments, with those areas highly affected by wildlife activities becoming neglected in terms of development. Funds were diverted for general development of other areas. In Zimbabwe. Murindagomo (1990) found that such a non-effective money flow through many bureaucracies reduces the amounts to insufficient levels for any effective development for the affected areas. The results are the introduction of land use practices that are incompatible with conservation, e.g. farming on the former dispersal zones, which continue to reduce the wildlife areas and concentrate wildlife in the core area

4.4 ANALYSIS OF STAKEHOLDERS

This part of the study was meant to check how far ecotourism has grown and whether it has achieved self-regulation. Discussions revealed that ecotourism activity was well known in the ecosystem Ecotourism started in the 1980's as a result of three major reasons. First, there was the need to involve the local people in conservation of the resources within their lands that are vital for tourism. This was driven by the fact that their exclusion would result in negative effects. Secondly, in the past decades, mass tourism dominated. This led to serious environmental conditions in the 1970's and 1980's characterised by off-road driving, animal harassment and improper waste disposal from the rapidly upcoming tourist facilities. Moreover, wildlife numbers were declining and there was need to halt the trend through effective conservation. Thirdly, there was changing demand amongst the visitors who wanted to get in touch with the local cultures, in addition to having their experience in undegraded environments, unlike that of Amboseli at the time. From then on. ecotourism practices **were** initiated despite the constant obstacles facing their success. Currently, ecotourism is characterised by involvement of the local people in conservation through community projects and benefit sharing, promotion of ecotourism activities and ecotourists. encouragement of environmentally conscious acts (e.g. re-afforestation), proper waste disposal pollution control and the discouragement of big hotel construction. Eco-!odges that utilise local materials with minimal environmental alteration are highly emphasised.

On conservation of resources, ecotourism played double roles by promoting and degrading the natural resources. It raised environmental awareness and maintained wildlife resources. For example, it is known that reliance on wood fuel by the tourism industry has negative

effects on the vegetation of an area through charcoal burning or fuel wood collection (KWS. 1994: Wearing and NeiL 1999). To avoid this, the lodges in the area installed solar panels to reduce the reliance on wood fuel even though it had not completely curbed the collection of dead wood from the neighbouring ranch land. Furthermore, ecotourism raised environmental concern by promoting proper waste disposal water treatment and re-afforestation process by some lodges.

One of the major hindrances in the achievement of effective conservation was described as the government's collection of taxes from ecotourism operators without ploughing back a substantial amount to maintain the environment effectively. Lack of a national ecotourism policy to regulate ecotourism implies that the general tourism policy is used with regard to tax revenue collection and implementation of conservation measures. The government carries this out. It was proposed that the government should delegate the responsibility of maintaining the environment to those operating in the ecosystem. It would allow for the sharing of responsibilities amongst the parties to effect the most desirable conservation measures, as their businesses depend on the level of environmental quality. Secondly, lack of effective co-ordination among the stakeholders and ad hoc local participation that is limited to non-technical issues also undermined the achievement of effective ecotourism. Participation is done by incorporating local people as partners in conservation, where they undertake community conservation and development projects, or in non-technical jobs. Participation of local people involves the lodges. KWS and some conservation groups.

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Benefit sharing with the local people was viewed as an effective way to win the local people's confidence in conservation matters. However, many factors, and especially the

problem of inequitable distribution, hindered this. None of the parties was concerned or attempted to seek a lasting solution. It would be wise, therefore, for the parties to assist in devising an effective mechanism to enable ecotourism benefits to contribute to household livelihoods. The sustainability of ecotourism businesses is directly or indirectly influenced by the acceptance of ecotourism by the local residents.

Ecoto irism. though not perfectly functioning in the Amboseli ecosystem, has gained some momentum towards self-regulation, especially with regard to environmental protection. It is a common practice with general tourism for lodge operators and tour companies to be only concerned about their businesses without the concern of the resources the businesses depend on and the local people. This was observed to be changing towards a situation where environmental and local residents' welfare is a major priority amongst some stakeholders rather than waiting for the government to implement environment conservation and community development projects.

4.5 VEGETATION INVENTORY

The vegetation study assessed the woody vegetation attributes in three sites, namely: the pastoral site, ecotourism site and a nature-based tourism site. The aim was to evaluate whether these land uses have similar influences on the woody vegetation parameters. The

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prediction was that in the ecotourism site where local residents are involved, higher vegetation parameters would be found since the residents would be more environmental conscious out of involvement in conservation related activities. From the results, it was observed that the woody vegetation in the study sites comprised a mixture of trees and

shrubs. Shrubs were more abundant than the trees. Within the three sites, a total of 42 species were encountered in the sampled plots (Appendix 1), with only nine tree species. However, more would be expected if all species were to be studied because there is a likelihood that some plant species were not encountered within the sampling plots. Twenty-three. twenty-seven and twenty-one species were encountered in the pastoral, ecotourism and nature-based tourism sites, respectively. Out of these, five species shared dominance among the sites, and they were used during data analyses. They include *Lycium europeum. Acacia tortilis, Maerua triphyla, Balanites aegyptiaca* and *Sericocomopsis hilderbrandtii.*

4.5.1 Cover

Vegetation cover in rangeland environments is essential due to its multiple uses, such as browse and shelter for animals, protection of soil from erosion, shade for sensitive plant species, addition of the scenic beauty, and in regulation of carbon dioxide levels in the atmosphere. Moreover, cover is an indicator of the ecological condition because areas devoid of it are likely to undergo environmental changes. The total cover for all species of trees and shrubs expressed per $100m^2$ was 68.71%, 35.96% and 63.10% for the pastoral, ecotourism and nature-based tourism sites, respectively. The percent cover of each woody species is presented in Appendix 1.

Plants with over 10% cover were *Acacia nubica. Acacia tortilis* and *Sericocomopsis hilderbrandtii* in the pastoral site. *Balanites aegyptiaca* in the ecotourism site, and *Acacia tortilis* and *Asystacia chairmian* in the nature-based tourism site. *Acacia tortilis* attained the highest cover values in the pastoral and nature-based tourism sites. The total cover was significant higher in the pastoral and nature-based site than in ecotourism site ($P<0.05$)

(Appendix 2). Moreover, there were a significant difference ($P<0.05$) for cover along distance gradients within the ecotourism and nature-based tourism sites (Appendices 3b and 3c). Percentage cover increased with distance from the park in the pastoral and nature-based tourism sites ($y=3.97x + 55.03$ and $y=7.06x +35.84$. respectively). This is due to the increase of the big woody trees and shrubs. In the nature-based tourism site, cover increase was quite drastic from the third kilometre; hence the high slope gradient indicated by the equation. The pastoral area exhibited fewer fluctuations than exhibited by the other two sites (Figure 4.3) with the lowest value at distance two where open grass plain existed, characterised by scattered trees and shrubs.

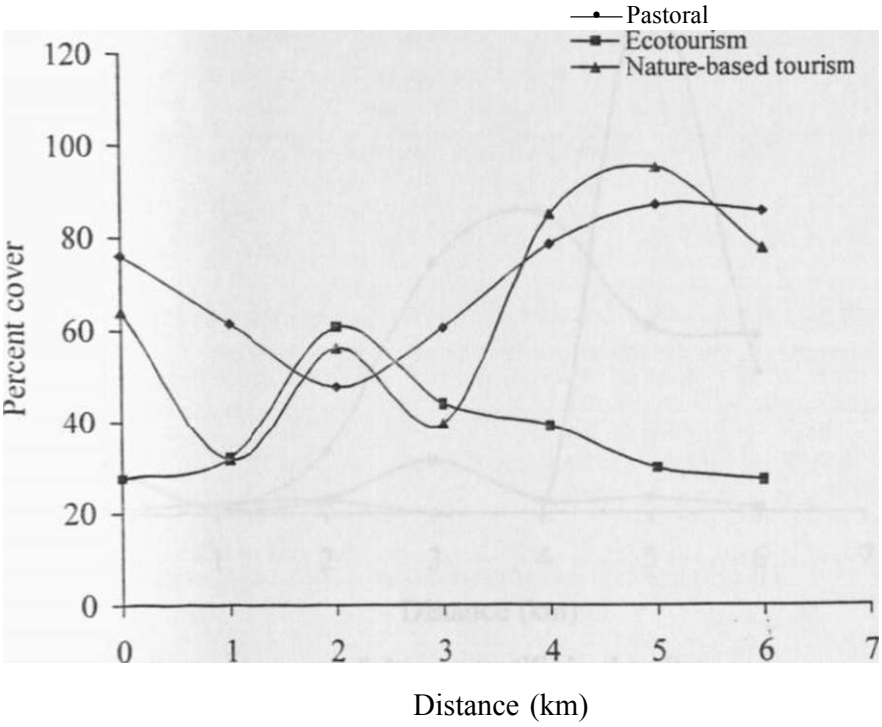

Figure 4.3: Percent total cover trend for three sites

Source: Author, 2002

The ecotourism site had low cover values except at distance two. It would be expected that the first two kilometres would record the highest values along the site, as they were nearer the southern part of the park where a woody belt previously existed. However, human activity in the settled area, aggravated by wildlife impact on the vegetation resulted in reduced cover for the first two sampling points as shown in Figure 4.3. The declining trend from distance three resulted from change in soil condition, which supported short trees and shrubs. Cover of *Acacia tortilis* increased with distance gradient both in the pastoral (y = 4.72x + 5.8) and nature-based tourism (y = 6.78x - 7.2) sites (Figure 4.4).

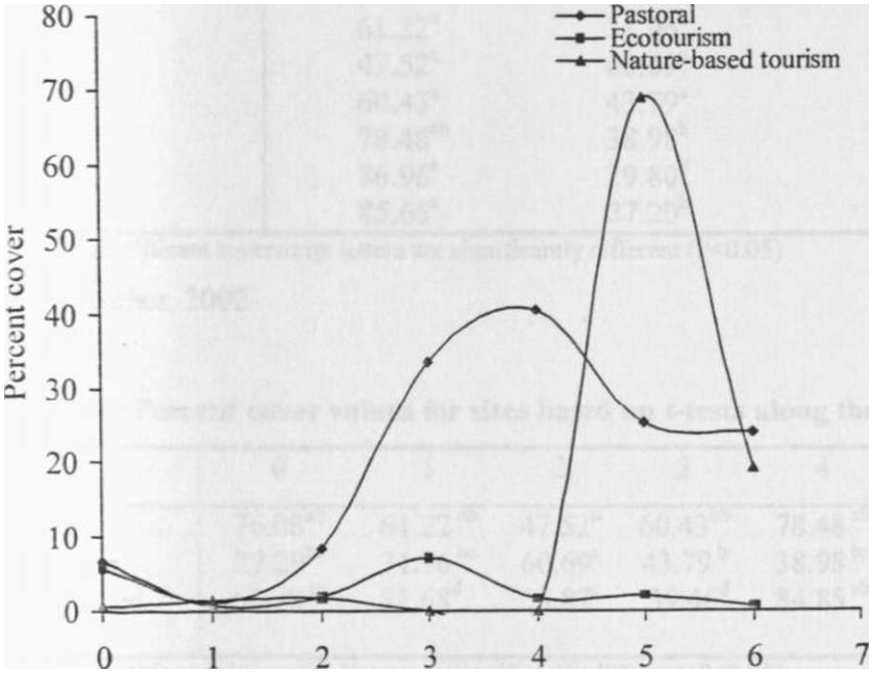

Figure 4.4: Percent cover of *Acacia tortilis* **in the sites ,**
Source: Author, 2002

In **the** nature-based tourism site, cover fluctuations were recorded for the first three kilometres. Felled logs of trees and stumps indicated that wild animals knocked down most of **the** trees in this area. The few remaining ones were debarked and massively destroyed.

Asystacia chairmian and *Sueda monoica.* dominated in the first three kilometres. *Acacia* sp., *Balanites* sp. and *Lycium* sp. only increased from the fourth kilometre, creating a rapid cover increase. Test for equality of means across sites for equidistant points from the park across the three sites, on the assumption that equidistant points have similar vegetation parameters, indicated that only the ecotourism site had significant lower values ($P<0.05$) at some points (Table 4.23). Table 4.24 shows t-tests based on distance gradient in each site.

Table 4.23: Mean cover (%) values indicating means test of equality across sites*

Distance	Pastoral	Ecotourism	Nature-based tourism site
0	76.08[a]	27.29[b]	63.87"
1	61.22"	31.96"	31.68"
2	47.52"	60.69"	55.87"
3	60.43"	43.79"	39.46"
4	78.48[ab]	38.98"	84.85"
5	86.96"	29.80"	95.27"
6	85.65"	27.20"	77.62"

•Values with different superscript letters are significantly different ($P<0.05$)

Source: Author, 2002

Table 4.24: Percent cover values for sites based on t-tests along the transect*

Distance	0	1	2	3	4	5	6
Pastoral	76.08[ab]	61.22[ab]	47.52°	60.43""	78.48[ab]	86.96"	85.64"
Ecotourism	27.29"°	31.96"°	60.69"	43.79"	38.98"°	29.80"°	27.20°
Nature-based tourism	63.78 "°	31.68[d]	55.87°	39.46[d]	84.85[a]"	95.27"	77.62"

•Values with different superscript letters are significantly different ($P<0.05$)

Source: Author, 2002

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The difference in the last three sampling points of the ecotourism site was attributed to rocky shallow soils that supported mainly *Acacia mellifera, Duosperma eremophilum* and *Berlaria ventricosa,* among others. However, harvesting of trees and shrubs for carving, building

bomas and enclosures reduced the *Balanites, Lycium* and *Acacia* species cover in the first two kilometres, which was evidenced by stumps.

The five common species showed significant difference ($P<0.05$) with distance gradient in the pastoral and ecotourism sites (Appendices 4a and 4b). Their cumulative cover also indicated a significant difference ($P<0.05$) in the ecotourism and nature-based tourism areas (Appendices 4d and 4e). The cumulative cover trend of these selected species is shown in Figure 4.5.

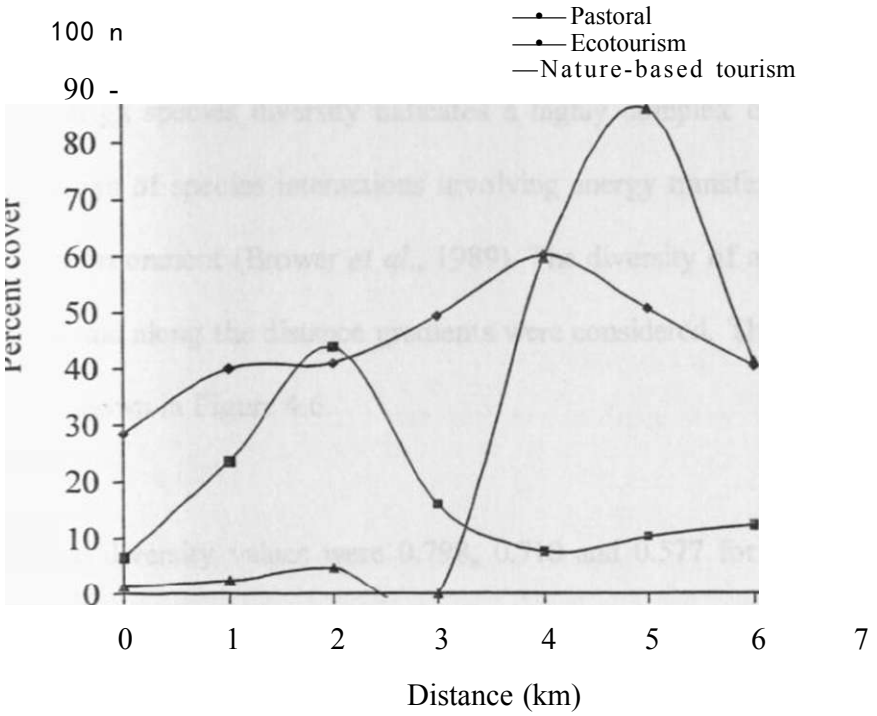


Figure 4.5: Cumulative cover trend for common species in three sites

Source: Author. 2002

Figure 4.5 indicates that the species in pastoral site maintained high cover values. They were evenly distributed over the site. The trend in the ecotourism site followed a similar pattern as that of the total cover. A different pattern was observed in the nature-based tourism site. The

first four sampling points had low cover values as a result of reduced number of trees and shrubs near the park. This indicates the de-vegetation process occurring around the Amboseli national park, changing the vegetation structure towards lower shrubs and grasslands.

4.5.2 Species diversity'

According to Brower *et al.* (1989), diversity refers to the richness and evenness of species composition of plant communities, and is an expression of the community structure. A community becomes species diverse if many equally or nearly equally abundant species are present. High species diversity indicates a highly complex community, which allows for larger arrays of species interactions involving energy transfer, predation. competition and niche apportionment (Brower *et al.,* 1989). The diversity of all species encountered within each site and along the distance gradients were considered. The diversity trends in the three sites are shown in Figure 4.6.

The mean diversity values were 0.798, 0.710 and 0.577 for the pastoral, ecotourism and nature-based areas, respectively. Analysis of variance showed significant differences ($P<0.05$) among sites (Appendix 5) and along distance gradients ($P<0.05$) in the pastoral site (Appendix 6, 7, 8). The high values in ecotourism and pastoral sites indicated that the two sites had even distribution of plant species. Nature-based area had the lowest diversity value because of domination by some plant species at some points. For example, sampling point two. three and four were dominated by *Asystacia chairmian* and *Sueda monoica.* Tests for equality of means along transects and between equidistant sampling points from the park showed the results in Table 4.25 and 4.26. Trend line analysis indicated that only the

pastoral site had an increasing diversity trend with distance from the park (y=0.0028x + 0.79).

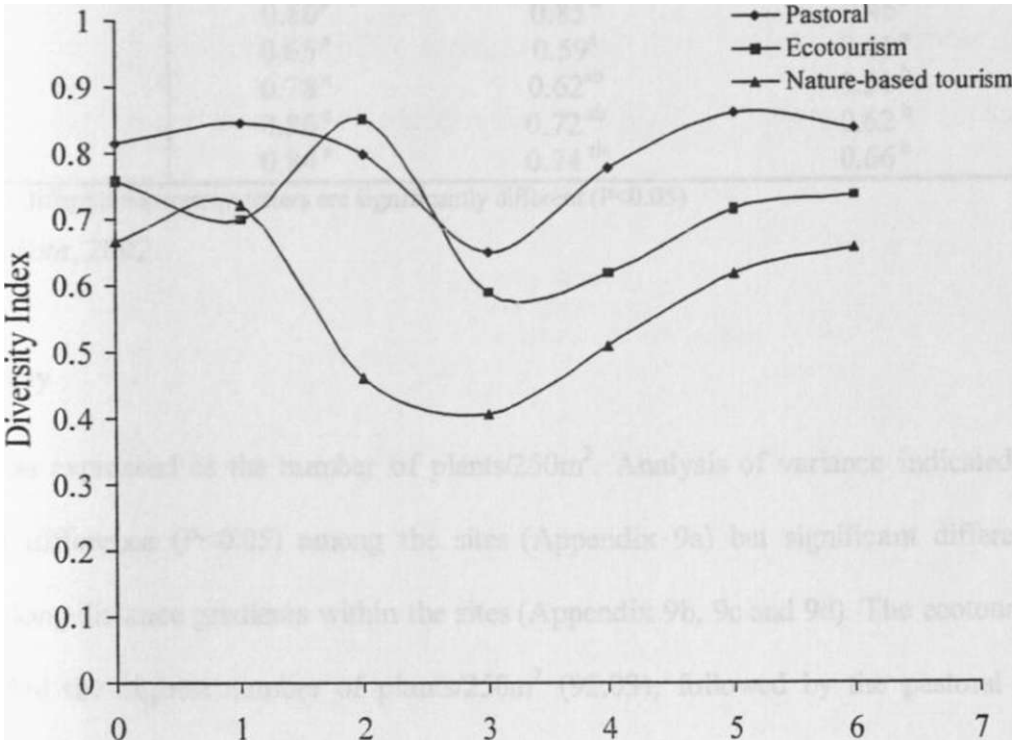


Figure **4.6: Trend of diversity with distance in three sites**

Source: Author, 2002

Table **4.25: Mean diversity values along transects***

Distance	0	1	2	3	4	5	6
Pastoral	0.82^{a}	0.85^{a}	0.80^{a}	0.65"	0.78^{ab}	0.86^{a}	0.84^{a}
Ecotourism	0.76^{b}	0.70^{b}	0.85^{a}	0.59^{b}	0.62^{b}	0.72^{b}	0.74"
Nature-based	0.67^{a}	0.72^{a}	0.46^{a}	0.41^{a}	0.51^{8}	0.62^{a}	0.66^{a}

•Values with different superscript letters are significantly different (P<0.05)

Source: Author. 2002

Table 4.26: Mean diversity values for equidistant points across sites*

Distance	Pastoral	Ecotourism	Nature-based tourism
0	0.82^{s}	0.76^{a}	0.67^{s}
1	0.85"	0.70^{b}	0.72^{8}
2	0.80^{b}	0.85^{a}	0.46^{c}
3	0.65^{4}	0.59^{a}	0.41^{a}
4	0.78^{a}	0.62^{ab}	0.51^{b}
5	0.86^{s}	0.72^{8b}	0.62^{b}
6	0.84^{a}	0.74^{ab}	0.66^{b}

•Values with different superscript letters are significantly different (P<0.05)

Source: Author, 2002

4.53 Density

Density was expressed as the number of plants/250m^2. Analysis of variance indicated no significant difference **(P**<0.05) among the sites (Appendix 9a) but significant difference occurred along distance gradients within the sites (Appendix 9b. 9c and 9d). The ecotourism site recorded the highest number of plants'250m^2 (92.03), followed by the pastoral site (72.68) and nature-based tourism site had the lowest (43.95)" The high value in the ecotourism site was attributed to the abundance of shrubs other than trees.

Density of woody species is summarised in appendix 1. For the case of individual plant species. *Sericocomopsis hilderbrandtii* attained the highest density in the pastoral site (I9.14/250m^2), *Asystacia chairmian* in nature-based tourism site (18.57/250m") and *Berlaria ventricosa* in ecotourism site (37.29/250m^2). This indicates the high abundance of shrubs other than trees in the study sites, which suggests that the ecosystem has undergone habitat change towards the lower levels. Information revealed that the place was once highly wooded than in the recent times, with the big *Acacia* trees dominating. However, they have declined tremendously over the years. Further analysis showed that the pastoral (y = 4.73x +

58.18) and ecotourism (y= 13.93x + 50.37) sites had density of woody vegetation increasing with distance. Density of *Acacia tortilis* too only increased with distance in the pastoral (y=0.704x + 1.45) and nature-based tourism (y=0.196x + 0.52) areas (Figure 4.7). This shows that *Acacia tortilis* could achieve increasing trend from the park if all areas were uniform in soil characteristics, which signifies the declining environmental quality around the park due to continued devegetation of the dominant tree species.

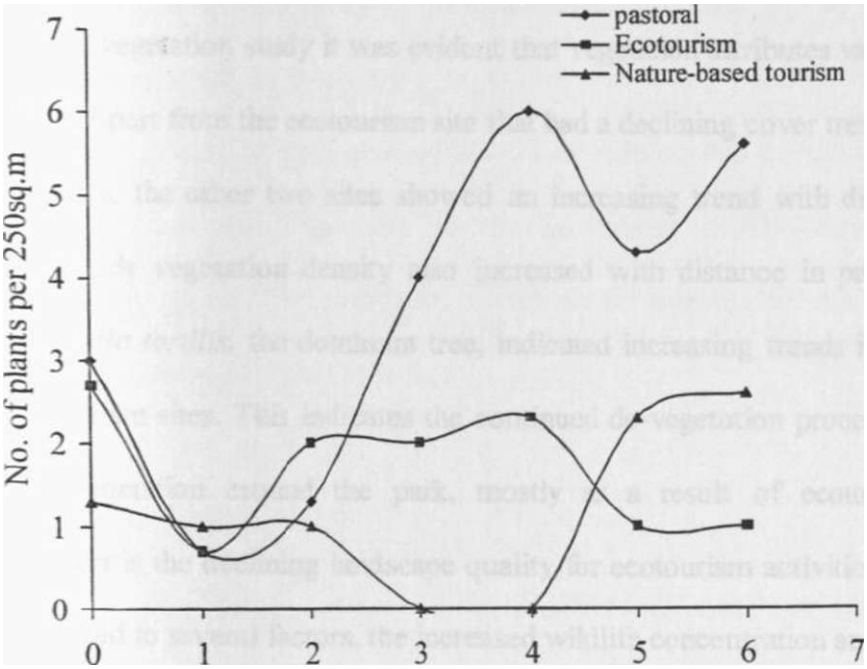


Figure 4.7: **Trend of *Acacia tortilis* density in three sites**

Source: Author. 2002

From Figure 4.7, it shows that even the density of *Acacia tortilis* was affected near the settlement in ecotourism site just like with other plants. Cut trees and shrub stumps indicated that the reduction in number of woody plants resulted from overuse for fencing, building and to some extent firewood. Four of the common species indicated significant difference ($P<0.05$) in density only in the pastoral site (Table 4.27).

Tale 4.27: Mean density per 250m" for four common species within sites

Site	*Acacia tortilis*	*Balanites aegyptiaca*	*Lycium europeum*	*Maerua triphyla*
Pastoral	1.19[b]	1.67[b]	6.51*	1.80"
Ecotourism	1.67"	2.71[8]	2.71[s]	3.20[a]
Nature-based tourism	3.21[a]	0.61[a]	4.67"	2.73"

•Values with different superscript letters are significantly different (P<0.05)

Source: Author, 2002

From this vegetation study it was evident that vegetation attributes varied across and within the sites. Apart from the ecotourism site that had a declining cover trend with distance due to soil factors, the other two sites showed an increasing trend with distance away from the park. Woody vegetation density also increased with distance in pastoral and ecotourism sites. *Acacia tortilis,* the dominant tree, indicated increasing trends in pastoral and nature-based tourism sites. This indicates the continued de-vegetation process that is reducing the woody vegetation around the park, mostly as a result of ecotourism activities. The implication is the declining landscape quality for ecotourism activities. Although this could be attributed to several factors, the increased wildlife concentration and human activities and grazing (in ecotourism site) were accelerating it.

The human settlements accelerated the opening up of the former woody portion through deforestation on the southern part of the park, reducing the cover and density. Duncan and Jarman (1993) and Kariuki (1995) found that cutting trees and shrubs directly reduce their cover and density. The consequences are that the woody portions vital for wildlife habitats and with high potential for community ecotourism activities, such as botanical studies, primate tracking, nature walks and bird viewing due to nearness to main tourist centres are

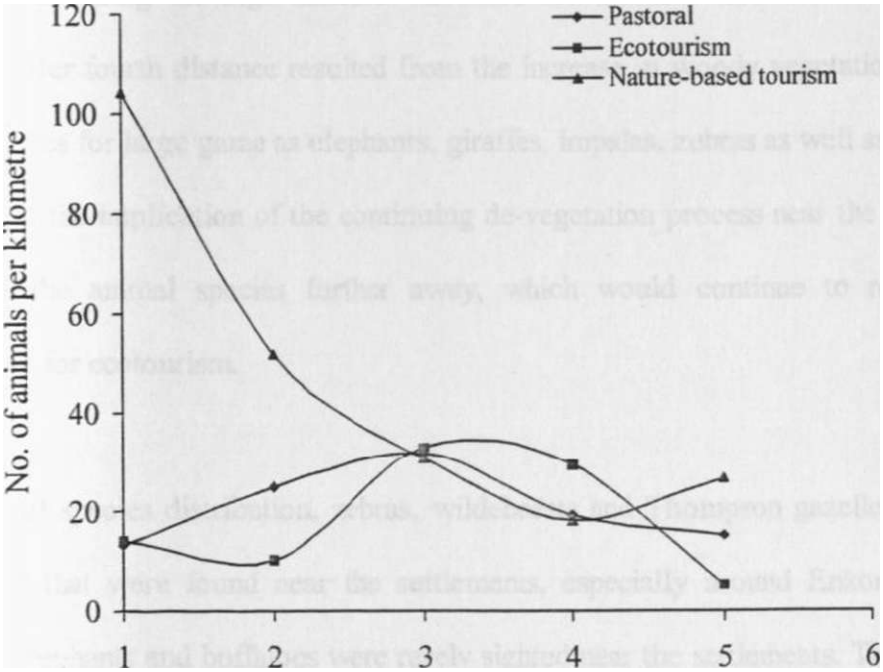
disappearing quite fast. Moreover, this is the place where the campsite is located. The big Acacia trees are vital for camping and for increasing the scenic beauty. Therefore, with continued settlements coming up around the National Park in order to benefit from the visitors, the quality of the ecotourism in the park and the surrounding areas will be affected. This has already been exhibited by the settlements in Enkong'u Narok where most vegetation attributes in the first three kilometres from the park boundary were lower compared to equidistant points in the other sites. This can only be blamed on lack of an effective mechanism of addressing how each and every household should benefit from ecotourism. Looking at such a scenario, it is conclusive that ecotourism activities have not promoted conservation in the area, but have accelerated the degradation likely to reduce the environmental appeal for ecotourism if corrective measures are not implemented, such as prohibiting settlements near the park.

4.6 WILDLIFE NUMBERS

Wildlife counting employed Brower *el ai,* 1989 roadside/trail count. The numbers of animals sighted were recorded with the number of kilometres moved from the park, which was meant to assess wildlife distribution in the three sites. Thirteen species were encountered. Nine species were sighted in the pastoral area, ten in ecotourism and nature-based tourism sites, respectively. Seven of the animal species were common in the three sites, and they included the zebras, wildebeests. Thomson gazelles, grant gazelles, elephants, impalas and ostriches.

An average of 20.72, 15.56 and 46.32 animals per kilometre was recorded in the pastoral, ecotourism and nature-based site, respectively. This indicates that use of land for nature-

based tourism accommodated significant higher animal numbers than other land uses due to lack of human interference. Significant differences ($P<0.05$) also occurred along distance gradients ($P<0.05$) in pastoral and nature-based tourism sites (Appendix 10a, 10b and 10c). For the seven common species, there was no significant difference between sites (Appendix 11), indicating their even distribution in the three sites. This was attributed to the fact that the study was conducted during the wet season when forage is available everywhere enabling wildlife to spread into the surrounding ranch areas more evenly. Wildlife distribution with distance from the park is shown in Figure 4.8.



Figures 4.8: Wildlife distribution in relation to distance from the park

Source: Author, 2002

As shown in Figure 4.8. the wildlife numbers in the pastoral area first increased up to the third kilometre and then declined. The decline could be attributed to human settlements and grazing impact from residents around Olmoti area. For the first two kilometres, there was

the possibility of not sighting all animals since the area was bushy. However, the peak at the third kilometre corresponded with an open grass plain with scattered trees, which provided a haven for a number of grazers. In the ecotourism site, the distribution followed a similar pattern as vegetation cover with numbers increasing between the third and fourth kilometres, and then declining as the vegetation cover declined. The declining numbers observed at point two resulted from presence of high human activity. In nature-based tourism area, the numbers declined with distance up to the fourth kilometre, then increased as the woody vegetation increased. The open plains with short shrubs provided good grazing fields for the grazers, facilitating the high numbers recorded for the first three kilometres. The slight increase after fourth distance resulted from the increase in woody vegetation that provided hiding places for large game as elephants, giraffes, impalas, zebras as well as monkeys. This shows that the implication of the continuing de-vegetation process near the parks will push some of the animal species further away, which would continue to reduce the park attractions for ecotourism.

In terms of species distribution, zebras, wildebeests and Thompson gazelles were the only big game that were found near the settlements, especially around Enkong'u Narok and Olmoti. Elephants and buffaloes were rarely sighted near the settlements. This supported the earlier argument by the local people in the ecotourism group that their settlement displaced some animal species from their former grazing portions into the park. This concurs with Kagwana (1993) argument that the distribution of big game in the Amboseli ecosystem has a bearing on the settlement patterns. Predator species were rarely seen in any of the sites due to their hiding nature. Therefore, it is evident that leasing of land for nature-based tourism in Kitirua accommodated more animals because of less human interferences although it

negatively affected the big woody plants. The involvement of local people in ecotourism and subsequent settlement on the other hand affected not only the vegetation but also the animal numbers and their distribution pattern through disturbance and competition for grazing resources with their livestock. Marcus (1973) argues that competition for resources by wildlife and livestock negatively impacts on the wildlife even though pastoralists do not actively kill them off from the ranges.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter, the main findings from the study are presented. Thereafter, the recommendations thought necessary to improve ecotourism in the ecosystem are given. They relate to the aspects studied on visitors, local community, stakeholders and environmental resources.

5.2 CONCLUSIONS

This study showed that majority of the visitors to the Amboseli ecosystem bear the characteristics of ecotourists. They mostly came from developed countries, such as USA (36.6%) and European nations (44.6%). Visitation from less developed nations was low. Most visitors were motivated to visit the Amboseli by the natural features (famous wildlife, beautifiil landscapes, Mount Kilimanjaro, birds and swamps), local people and their cultures. In spite of the diverse motivations, the scope of ecotourism activities undertaken in the region was mainly limited to wildlife safaris (96.1%), photography (89.1%) and bird watching (50.5%). This was probably due to the lack of diversification of tourism activities. Emphasis was placed on game viewing safaris.

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The tourists to Amboseli were environmentally conscious. A moderate number (40.6%) were members of conservation groups. They expressed the will to support conservation in the ecosystem (55.4%). Their main concern was over the massive destruction of vegetation by wildlife through debarking and knocking down of big trees that lowered the

environmental appeal of the area. This results from preservation of animals without proper monitoring of their population dynamics to maintain environmental integrity, which is compounded by changing climatic patterns, ageing of trees, and the rise in the level of the water table (Altman *et al,,* 2001; Western. 1989). This made Amboseli of lower environmental quality (49.3%) than other areas in Kenya. Nevertheless, the trip experience to many visitors (68.3%) was satisfactory and worth the cost incurred. This is because there were no major problems encountered except for inconveniences caused by rough roads (57.4%). Information and services at the facilities were declared satisfactory for ecotourism.

The trip duration remained at two days as observed in the early 1990's by Nzioka (1994), probably due to lack of diversified tourism activities, with the main emphasis being placed on wildlife safaris. Moreover, the area used for such activities is small and can be covered within a few hours of game drive. Wild animals have also become calm to human activities over the years and are concentrated around water points, making game viewing over a short duration of time possible. Therefore, despite the initiation of ecotourism in the 1990's, it has not been well diversified and developed in ranches.

The visitation trend over the last decade declined from over 200,000 visitors in 1990 to around 87,000 by the year 2000. This resulted from a multiple of issues, such as increasing insecurity, poor infrastructure, political instability and declining environmental quality. Moreover, there was the management aspect of promoting ecotourism by restricting would be mass tourists through increasing entry charges. In spite of these, ecotourism as an activity was gaining grounds and headed towards self-regulation, something that never happened with mass tourism. The visitors too showed concern for the local people. They supported the involvement of local people in ecotourism projects, in management and derivation of the

benefits. The support for local people was further expressed by the purchase of local products by a majority of the respondents (72.3%), which enabled them earn a living. Eagles (1992) reported that one way that ecotourists express their concern for local residents in an area is through the purchase of local products because it assists improve micro-enterprises and hence the local economies.

In connection with Olgulului group ranch, ecotourism activity had been operational for about two decades. Its existence carried both positive and negative effects on the local people and their natural environment. The main beneficiaries from ecotourism were the involved households through selling local products and employment. The other categories of households only benefited from some employment openings and social benefits directly or indirectly. Most households continued to rely on livestock, livestock products or goods obtained through livestock sales and farming, implying that ecotourism was not an effective land use to reduce the reliance on livestock to most households in the ranch as expected. Apart from generating incomes for the involved households, ecotourism motivated education through development of schools and provision of school bursaries for post-primary education. This motivated many families to let their children attend school in the effort to benefit from the bursary scheme or obtain employment in the lodges after completing school. The main problem with the social projects was that they were inequitably distributed in space, making them inadequate for the residents. Their distribution pattern seemed to influence the attitudes to conservation, since those in positions likely to derive more from ecotourism activities (ecotourism and farming households) expressed a positive attitude to wild animals than those in less likely positions such as the pastoral group.

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Costs were spread to almost all households unlike the benefits. They were mainly disease transmission to livestock, competition for resources (pasture and water), crop damage, loss of lives, and disruption of school programmes (in the pastoral group). Moreover, the reduced reliance on livestock in the ecotourism households, coupled with livestock addition from tourism revenues, resulted in overgrazing around the settlements.

Lack of community ecotourism projects to effectively contribute to the livelihoods of all households was constrained by internal and external factors. The main ones were cited as inequitable distribution of derived benefits, corruption and poor leadership, lack of management skills, lack of credit facilities to finance community projects, superficial involvement and improper marketing. Community leadership was used as the intermediary between the stakeholders in tourism and the community. Agreements or negotiations for developments and benefits were entered into with the group leadership. The repercussions were the non-effective flow of benefits and information to all due to lack of transparency. This is likely to continue affecting the conservation endeavours in the future if no interventions are made to involve all. because ecotourism will be viewed as a non-benefiting enterprise.

On the environment and natural resource management, ecotourism activities profoundly affected the environmental quality of the ecosystem. This is due to non-consumptive use policy adopted that creates a haven for wildlife escaping the effects of hunting in Tanzania. i compounding the effects of large herds held as a result of ecotourism failure to effectively deliver to livelihoods, and settlements near the park. Consequently, overgrazing and vegetation destruction arises through building enclosures, harvesting of firewood and carving. This reduces the density and cover of the woody components, which has the

potential for more ecotourism activities especially due to proximity to tourism centres (lodges and the campsite). This portrays lack of environmental awareness. The vegetation parameters under study (cover and diversity) varied among sites and along distances within sites, thereby failing to support the hypothesis that areas of different ecotourism intensities have no significant difference in vegetation parameters. Vegetation parameters in the pastoral she increased with distance from the park. The pastoral site also recorded higher values than the rest of the sites. In the ecotourism site, only density increased with distance due to the increasing numbers of shrubs and short trees, while in the nature-based tourism site, only cover increased with distance gradient. The increasing trends of plant parameters (especially density and cover) with distance from the park indicated the devegetation process that continues to erode the landscape quality of areas around Amboseli National Park.

The distribution of wildlife numbers with distance from the park showed a significant difference ($P<0.05$) in the pastoral and nature-based tourism sites, with the numbers declining with distance from the park. This has a bearing with water availability and security in the park. The distribution of the seven common wildlife species in the three areas during the wet season indicated no significant difference between sites ($P<0.05$). Nature-based tourism activity maintained a higher number of animals per kilometre than other land uses. The promotion of ecotourism through the involvement of local residents resulted in settlements on the wildlife migration corridor and increased human-wildlife conflicts. The settlements also opened up the previous woody vegetation that harboured wildlife species such as buffaloes and gazelles. Such affected species (buffaloes and gazelles) were dislocated to the nearby park or moved further away, reducing their numbers near the settlements.

5J RECOMMENDATIONS

With the above findings, the following recommendations were found necessary to improve ecotourism to the level of being an effective land use in the study area:

- To enhance effective community ecotourism. there is need for effective participation of all through open consultations, have a mechanism for equitable distribution of benefits, train local project managers wi[r].h effective skills, and enhance effective collaboration with other stakeholders to facilitate effective marketing of products rather than depending on goodwill.

- To maximise ecotourism experience, there is need to diversify the tourism package through activities, such as nature walks, fishing in swamps, canoeing, hill climbing and botanical studies especially in the ranches, and maintain proper road network that is passable even during the wet season.

- There is need to devise effective ways of monitoring wildlife population dynamics. This would reduce the incidences of massive destruction of the vegetation for purposes of maintaining the landscape quality and reduce competition for resources with domestic livestock.

- There is need to promote environmental awareness amongst the local people coupled with reseeding and rehabilitation of the affected areas around the settlements. Moreover, when community ecotourism projects are initiated, environmental impact assessment need to be conducted to reduce the probable effects later on.

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APPENDICES

APPENDIX 1: List of plant species encountered in the study sites

		Pastoral site		Ecotourism site		Nature-based tourism si	
Spfdes name	Form	•/•Cover	Density/250m'	•/•Cover	Density/250m'	•/•Cover	Density/250m
Abutikn mauritianum	S	0.00	0.9	0.01	0.29	x	x
Acacia oepanolobium	S	x	x	0.46	0.51	x	x
Acada mellifera	S	2.75	1.31	7.85	3.09	x	x
Acacia nubica	S/ST	18.16	5.59	x	x	x	x
Acacia tortilis	T	19.%	3.21	2.32	1.67	13.13	1.19
Acacia xanthophloea	T	x	x	r	x	0.13	0.39
Asparagus atricana	S	x	x	x	x	0.00	0.19
Asysiaria chairmian	S	x	x	0.77	2.1	10.50	18.57
Balanites aegyptiaca	T	1.46	0.61	10.32	2.71	5.13	1.67
Balanitis orbicularis	T	x	x	x	x	6.05	1.43
balanites \\ iisonii	T	x	x	3.67	1.51	9.31	3.46
Benaria acanthoides	DS	0.89	9.29	0.11	4.14	x	x
Beriaria erenthemoides	DS	0.17	1.10	0.11	1.47	x	x
Berlaria ventricosa	DS	0.34	4.70	0.50	37.29	x	x
Boscia angustifolia	T	x	x	0.70	0.51	0.18	0.10
Boscia sacili folia	T	x	x	0.01	0.04	x	x
Cadaba farinosa	S	0.67	0.37	0.83	8.30	x	x
Cacarris tomentosa	S	x	x	0.17	0.14	0.05	0.14
Commiphora sp.	T	0.42	0.14	x	x	x	x
Cordia gharat"	S	x	x	0.01	0.19	x	x
Duosperma eretnophilum	S	0.03	0.04	x	x	x	x
Dyschoriste radicans	S	1.19	4.23	0.11	0.76	0.00	0.10
Ecboiium r. amatum	DS	0.12	0.57	0.10	1.47	x	x
Grewia villosa	S	x	x	0.06	0.33	x	x
bcigofcra spinosa	S	0.01	0.04	x	x	x	x
Laniana verbenoides	S	0.01	0.13	x	x	0.00	0.10
Lepidagaihis scabra	S	x	x	0.09	3.04	x	x
Leucassp.	S	0.21	4.04	x	x	x	x
Lycium europeum	S	6.95	4.67	1.66	1.66	7.85	6.51
Vlaerua angolensis	S	x	x	0.05	0.14	x	x
Maerua subcordata	S	x	x	0.01	0.67	0.05	0.19
Maaua pubescence	S	0.50	0.33	x	x	x	x
Maenia triphyla	S	3.38	173	1.82	3.20	0.87	1.80
Ocimian kilimandscharicum	S	0.09	4.51	0.13	11.56	x	x
CMcsaiyet*	S	0.29	0.04	x	x	x	x
Psychotria kirkii	S	x	x	x	x	0.00	0.61
Salvadora persica	S	x	x	1.64	37	1.10	0.74
Ssricocomopsis hilderbrandtii	DS	10.45	19.14	0.89	3.16	0.90	1.41
Soianum incanum	S	0.77	4.99	x	x	0.06	1.73
Soianumrenchii	S	x	x	x	x	0.08	033
Sueda monoica	S	x	x	x	x	7.71	2.76
Withania schomnifera	S	x	x	x	x	0.00	0.53
		68.79	72.68	35.95	92.03	63.10	43.95

' Plant species identified by local name only. S= shrub. D S= dwarf shrub. ST small tree. T= tree. x= plant species not -Txxmntered. hence no value

Appendix 2: ANOVA for total cover among sites

Source of Variation	SS	df	MS	F	P-value	F crit
sites	4554.55	2	2277.27	7.742**	0.00693	3.885
distance	2073.74	6	345.624	1.175^{05}	0.38090	2.996
Error	3529.78	12	294.148			
Total	10158.1	20				

Appendix 3a: ANOVA for cover in the pastoral area

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	3928.73	6	654.788	1.643^{ns}	0.20771	2.848
Error	5578.48	14	398.463			
Total	9507.20	20				

Appendix 3b: ANOVA for cover for ecotourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	2636.63	6	439.438	7.107**	0.00125	2.848
Error	865.598	14	61.8284			
Total	3502.23	20				

Appendix 3c: ANOVA for cover in nature-based tourism area

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	9933.27	6	1655.54	28.006*	0.04980	2.848
Error	827.588	14	59.1134			
Total	10760.9	20				

Annendix 4a: ANOVA for five common snecies cover in pastoral area

Source of Variation	SS	df	MS	F	P-value	F crit
species	1407.71	4	351.927	4.827**	0.00532	2.776
distance	122.461	6	20.4101	0.28^{ns}	0.94082	2.508
Error	1749.61	24	72.9005			
Total	3279.79	34				

Appendix 4b: ANOVA for five common species cover in ecotourism area

Source of Variation	SS	df	MS	F	P-value	Fcrit
species	431.371	4	107.843	3.091*	0.03470	2.776
distance	205.606	6	34.2677	0.982[1,5]	0.45878	2.508
Error	837.258	24	34.8857			
Total	1474.24	34				

Appendix 4c: ANOVA for five common species cover in nature-based tourism site

Source of Variation	SS	df	MS	F	P-value	F crit
species	744.669	4	186.167	1.:'04[nS]	0.37738	2.776
distance	1446.04	6	241.007	1.429[05]	0.24455	2.508
Error	4046.36	24	168.598			
Total	6237.07	34				

Appendix 4d: ANOVA for species cumulative cover in ecotourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	3084.248	6	514.041	10.420**	0.0002	2.848
error	690.6335	14	49.331			
Total	3774.881	20				

Appendix 4e: ANOVA for cumulative cover of the five species in the nature-based tourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	21684.68	6	3614.114	34.708*	0.0267	2.848
error	1458.156	14	104.154			
Total	23142.84	20				

Appendix 5: ANOVA for **diversity between sites and distances**

Source of Variation	SS	df	MS	F	P-value	F crit
sites	0.1735	2	0.0867	18.615**	0.00021	3.885
distance	0.1052	6	0.0175	3.762*	0.02425	2.996
Error	0.0559	12	0.0047			
Total	0.3346	20				

Appendix 6: ANOVA for diversity in pastoral site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	0.0902	6	0.015	7.045**	0.00130	2.848
error	0.0299	14	0.0021			
Total	0.1201	20				

Appendix 7: ANOVA for diversity in ecotourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	0.138	6	0.023	$2.272^{1,5}$	0.09652	2.848
Error	0.1417	14	0.0101			
Total	0.2798	20				

Appendix 8: ANOVA for diversity in nature-based tourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	0.2545	6	0.0424	1.572^{ns}	0.2270	2.848
Error	0.3777	14	0.027			
Total	0.6321	20				

Appendix 9a:ANOVA for densitv between sites

Source of variation	SS	df	MS	F	P-value	F crit.
Sites	8238.6	2	4119.3	2.903^{ns}	0.081,	3.555
error	25542	18	1419			
Total	33781	20				

Appendix 9b: ANOVA for density in pastoral site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	16216	6	2702.7	4.518**	0.0095	2.848
error	8374.7	14	598.19			
Total	24591	20				

Appendix 9c: ANOVA for density in ecotourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	39925	6	6654.1	4.2298**	0.012	2.848
error	22024	14	1573.1			
Total	61949	20				

Appendix 9d: ANOVA for density in nature-based site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	20462	6	3410.4	7.4704**	0.001	2.848
error	6391.3	14	456.52			
Total	26854	20				

Appendix 10a: ANOVA for wildlife distribution in pastoral site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	1159.84	4	289.96	5.118**	0.0053	2.866
error	1133.2	20	56.66			
Total	2293.04	24				

Appendix 10b: .ANOVA for wildlife distribution in ecotourism site

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	2988.56	4	747.14	2.504'*	0.075	2.866
error	5968	20	298.4			
Total	8956.56	24				

Appendix 10c: ANOVA for wildlife distribution in nature-based sites

Source of Variation	SS	df	MS	F	P-value	F crit
Distance	24175.44	4	6043.86	5.096**	0.005	2.866
error	23720	20	1186			
Total	47895.44	24				

ADDendix 11: ANOVA for the seven common wildlife species between sites

Source of Variation	SS	df	MS	F	P-value	F crit
Sites	2416.661	2	1208.331	2.56^{ns}	0.119	3.885
error	5664.768	12	472.064			
Total	8081.429	14				

NB: ns = not significant at 5%, *= significant at 5%, **=highly significant at 5%

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