HUMAN-WILDLIFE CONFLICT IN LAIKIPIA DISTRICT: *AREA SPECIFIC STRATEGY RECOMMENDATIONS*

BY

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DECLARATION

This thesis is my original work and has not been presented for a degree in any University.

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This thesis is has been submitted for examination with my approval as University supervisor.

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DEDICATION

This work is dedicated to my parents for their tiress support they have given me throughout my academic life.

ACKNOWLEDGMENT

This thesis is an outcome on field research in Laikipia District from January to March 1998 The study aimed to achieve many objectives within a limited timeframe and resources. The completion of the study however, has become a reality as a result of support by institutions and individuals who were committed to see me carry the work to a reasonable conclusion. I'm greatly indebted to individuals who helped me in one way or another in all the stages of the study. Since it is not possible to thank them individually, I extend my gratitude to all of them.

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ABSTRACT

The evolution of conflict often arise from divergent view points and the manner to derive benefits from a common resource. The increasingly limited supply of natural resources especially, in Arid and Semi Arid Lands exacerbates tension between various actors with vested interests in the use of the same resources. Wildlife is an important natural resource in Kenya as an environmental heritage, and cultural source of both food and revenue. Thus the government of Kenya has taken important measures to protect wildlife through gazetting certain areas for exclusive use by wildlife such as Parks and Reserves. Recent research findings have indicated that protected areas only contains less than 20 percent of the total wildlife species found in Kenya. The other 80 percent resides outside the protected areas in privately owned land where the wildlife is often in conflict with human settlement. Laikipia District is a case in point which is an important wildlife refuge outside these protected areas. Continued presence of wild animals in the District is now threatened by changes in land use brought about by demographic changes occasioned by continued influx of population from the high potential areas of Central Province. The incoming population bring with them intensive agricultural land use practices which are incompatible with migratory regimes of the wild animals in the region. The farms are thereby exposed to continuous destruction by elephants and other wild animals. This problem is more serious in Ngobit, Sirima, and Salama Locations where this study was carried out.

This study aimed to investigate the types, intensity and effects of human-wildlife conflict and to suggest a mechanism for spatial resolution of the conflict. It further sought to assess how the government and the community reach at resolutions aimed to abet conflict, and the types of solutions in the context of existing policy. In order to achieve the above broad objectives three conflict zones namely, Kariunga/Mutirithia, Ngobit /Sirima and Ethi /Laikipia East were selected for detailed data collection and analysis. The three areas do have land use conflicts generated between wild animals on the one hand; and farming of livestock and crop rearing. A number of methods were used to collect data on the field, the most widely used being questionnaires, interviews, filed observations and photography among others. Respondents were mature household heads or their representatives randomly selected.

In order to achieve a long lasting resolution between humans and wildlife the study recommends for a wildlife dispersal and migratory corridor be conserved from Samburu, Mt. Kenya and the Aberdares ecosystems through Laikipia. Land use activities along the dispersal corridor should strictly be in harmony with wildlife conservation. This strategy presupposes the legislation of a national land use plan based on Kenya's agro-Ecological zones.

The study further recommends that as part of a wider scheme, area specific strategy resolutions should focus on the control of the problematic animals and the adoption of modern and effective control methods. It is further recommended that an efficient compensation scheme be put in place and a consideration of re-introduction of sports hunting. Farmers on their part should also be involved in the management of wildlife and encouraged to take up eco-tourism and other wildlife income generating related projects such as bee-keeping and ostrich farming.

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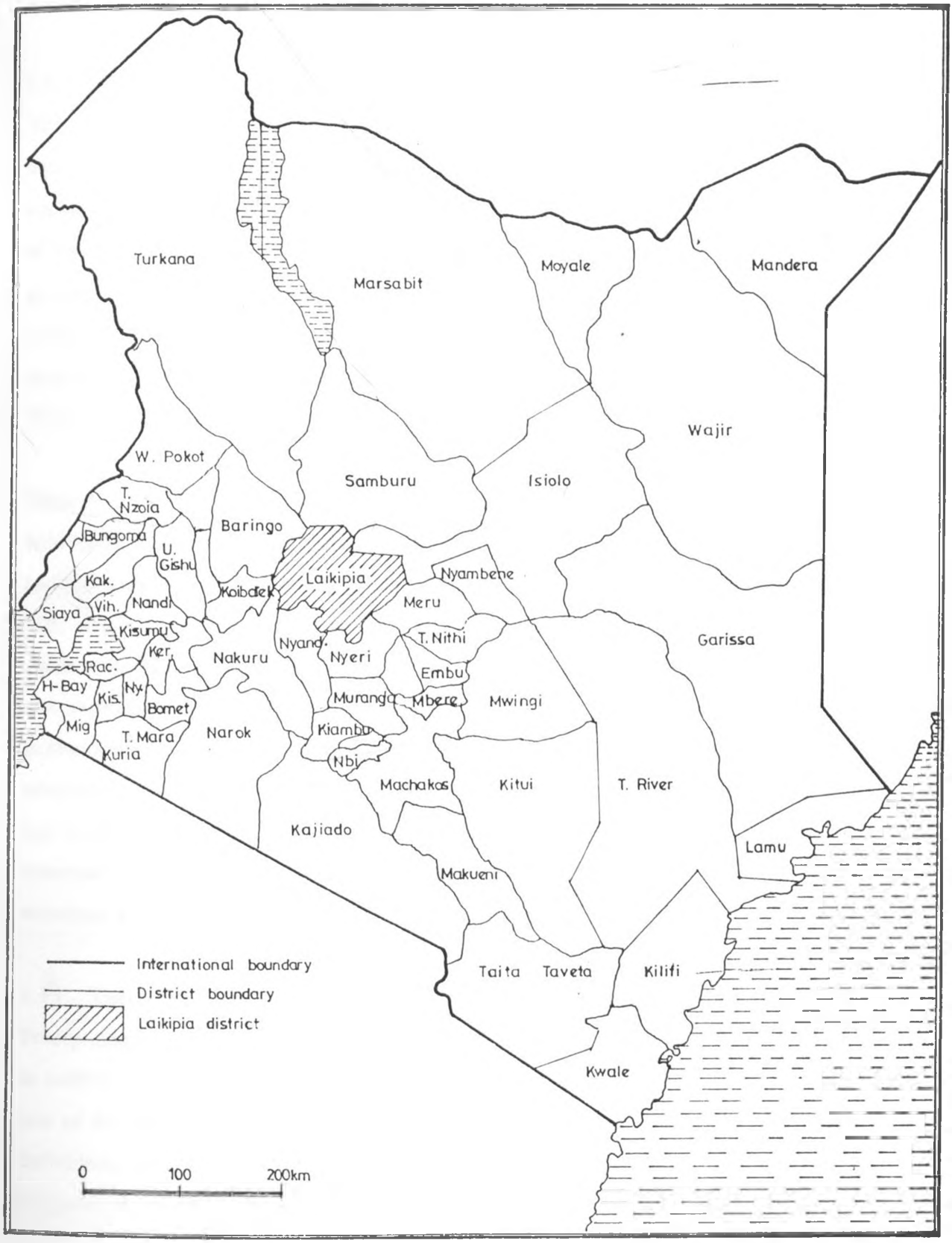

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The central importance of natural resources in any one given community cannot be over emphasised. Interest in wildlife resource rests upon recognition of its values and the need to conserve it as both an environmental heritage and as source of livelihood now and for the benefit of future generations. Kenya's wildlife heritage is not only unique, but also valued by the Kenyan government which has taken important steps to protect it. The Kenyan government and its conservation agents, have succeeded in setting aside a system of protected[1] areas such as national reserves and parks as wildlife refuge areas. Laws to protect wildlife have been formulated such the Wildlife Act and laws to ban unauthorised hunting.

These measures notwithstanding, there is evidence to show that with time, conflict between wildlife protection and human land uses is on the increase. It appears that wildlife conservation and protection policies and measures alienate these resources from people. At the same time very little of this national income trickles to the local communities; who often have foregone their claim to land now occupied by wildlife and whose crops for those with land units close to parks and reserves are often destroyed by wild animals resulting in loss of crops and human. Bureaucratic procedures for compensation are too long and often claims are never compensated adequately. This situation has resulted into a negative perception and attitude towards benefits that can accrue from wildlife and the intervention of conservationists. Perception and attitude of local communities is that the government places more value on wild animals than in human life and economic activities that provide for livelihood.

1.1 Perceptions and Strategies in Environment - Development Matrix

Perceptions and strategies of policy makers who at the national level are deciding actors is crucial in wildlife resource management, linking environment and development. But the linkage remains one of the most misunderstood because of the complex nature of interests. The way different individuals and communities perceive wildlife is a function of the present socio-cultural, economic and political conditions, not withstanding their historic environmental backgrounds.

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[1] Protected areas provides the last refuge for wildlife. However over 75 percent of the total wildlife population in Kenya reside outside the protected area system.

There are costs associated with living close to wildlife areas, but once local communities can tolerate and co-exist with wild animals were they do derive sufficient benefits to justify the co-existence and tolerance. This will require a change of attitude, perceptions and strategies by government and its agencies in administrating wildlife management practices and in the handling of concerns of local communities.

1.1.1 Challenges in Wildlife Management

Culture is dynamic and with time change is always inevitable. Tolba and Khony (1992) suggests that perception and relationship of individuals on the natural environment is moulded by traditions, personal observation and experience, as well as formal and informal education. But factors such as demographic transition are impacting on culture and importance of non-formal information. Perceptions towards conservation of nature in general and wildlife in particular have greatly changed everything. Modern conservation approaches are still regarded as alien ones. Entrenchment of the money economy has also eroded important indigenous attachment to wildlife as for example in Kenya, government earns money from wildlife based tourism without visibly spending some of the money in the communities. Table 1-1 shows earnings from tourism between 1991-1997.

Table 1-1 Earnings From Tourism Between 1991- 1997 ('000 K. Pounds)

YEAR	1991	1992	1993	1994	1995	1996
EARNINGS	11062	13224	16681	20036	22785	25896
PERCENTAGE OF GNP	5.4	5.7	7.3	7	5.4	4.9

Source: GOK Economic Survey, 1997 pp. 9

Arising from this fact, Kenya faces four main challenges in planning for wildlife based natural resources in the Arid and Semi Arid Lands (ASALs), namely; (1) limited land, (2) high rate of population growth, (3) poverty, and (4) poor performance of national economy (World Bank, 1994; GOK, 1996). The performance of the Kenyan economy have been on the downward trend for the last four years; lower than he population growth rate. In 1995 the GDP growth rate was at its highest in three years with a 4.8 percent. The rate of growth per annum declined to 4.6 and 2.3 percent in 1996 and 1997 respectively, and recorded only 1.3 percent over the last 12 months in 1998. This means that Kenya is hardly able to provide for the increased population.

Over 95 percent of National Parks and Game Reserves in Kenya are located in the ASALs (Wandera, 1998). This means that the ASALs are important in national economy as the wildlife found there is one of the most popular tourist attractions. Most importantly, 80 percent of Kenya's wildlife species reside outside National Parks and Reserves where these animals are in constant contact with crop farming and livestock rearing communities (Wandera, 1998 and KWS, 1996). As government goes about the business of implementing its own wildlife conservation and management policies; and as farmers undertake their farming and livestock rearing activities conflict between the two categories of actors often occur. Often, the farmers as the local actors are the losers. Until new ways are devised to resolve the endemic conflict implicit in the different interests, perceptions and strategies pursued by government on one hand, and communities close to wildlife areas on the other, this problem will continue to persist.

Strategies devised for human-wildlife conflict resolution must take into account spatial typology, intensity and effects of the conflict. This research aims at understanding the social economic and institutional factors responsible for human-wildlife conflict, to recommend a model for conflict resolution outside protected parks and the reserves and hopefully, to contribute preventive measures for environmental degradation in arid and semi-arid areas.

1.2 Statement of Research Problem

The problem of wildlife-human conflict has escalated in recent years though man and wildlife have co-existed for many years (Thouless, 1990; Mcneely, 1995 and Wandera, 1998). Rural people have traditionally regarded wildlife as a resource that is theirs to use because the resources play an important role in their local cultures, diets and economies (Omondi, 1994). This has been particularly so in the Arid and Semi Arid Lands which are well endowed with a substantial wildlife population. However the situation has greatly changed due to four main factors.

First, continued presence of wild animals outside the protected areas is threatened by changes in land use brought about by demographic changes in the ASALs. The demographic change are brought about by continued influx of populations from the high potential areas to these Arid and Semi Arid Lands bringing with them intensive agricultural activities which are incompatible with migratory or movement regimes of the wild animals.

Second, only 12 percent of Kenya's total area of approximately 569,250 KM^2 is arable. This portion of land consists of areas that have adequate rainfall for intensive crop farming (Omondi,

1984 and World Bank, 1994). Seasonal rainfall is the most critical factor in determining population density in Kenya. As a result 88 percent of Kenya's land is classified as Arid and Semi Arid Lands (ASALs) where a mere 20 percent of the population live (World Bank, 1994).

Third, in the past the Kenya government have concentrated on developing the high potential areas such that the ASALs have received very little attention (Omondi, 1984). Due to high rate of population growth leading to land shortage in the Kenya the government has began to invest public resources in the of development ASALs. To illustrate government commitment to ASAL, Sessional Paper No. 1 of 1986 on ASALs and 1988-1993 development plan were used to outline government policy.

Finally, according to the 1989 population census the population of Kenya is estimated to be over 27 million people and is growing at a rate of 3.4 per cent per annum. The mere fact of this level of population growth rate does not constitute the problem, but when it is related to the demand the population places on existing land in the context of lack of appropriate technologies to make the land more productive; a different picture emerges. Competition for land between the human settlement development and for wildlife habitat becomes a more bitter rivalry.

1.2.1 Background to Land Problems and Human-Wildlife Land Use Conflicts

Currently, land provides the main source of livelihood to over 80 percent of the population, in the rural areas for subsistence farming, and in the in urban areas for the development of various forms of urban property (Omondi, 1984).

Before the adoption of the 1997-2002 development plan on industrialisation, as the official government policy on development planning, the government portrayed Kenyan economy as primarily agricultural one (GOK, 1997). Overtime the agricultural orientation of the Kenyan economy was supported by a programme of land adjudication and changes in land tenure which has transformed most public land to freehold units. Other changes in land use and land tenure includes; increased sedentalisation of the pastoralists, sub-division of large-scale ranching to small-scale plots and subsistence farming units. The resulting settlement development is smaller plots or units of land with structures such as fences, a permanent house, stores, wells, boreholes and other household support infrastructures.

These aspects of land use and land tenure changes have resulted into intense conflicts between man and wildlife especially where human settlement and wildlife areas adjoins. While it appears that the human-wildlife conflicts have attracted the attention of few planners, particularly, those in conservation planning, no consensus has yet emerged on the general principles and practices to resolve the conflicts. Most of the studies and the policies advocated by majority of the studies have concentrated on methods of protecting wild animals from humans and how man and wildlife can physically, be separated. The result is the establishment of game Parks and game Reserves.

Policies on wildlife management and ownership; with the exception of a few cases have favoured the central governments agencies. Following this, the economic and indeed recreational benefits derived from the wildlife are foreign tourism orientation and national wide benefits. Consequently, a relationship of complete separation between the wildlife and people overlooks practical realities in ecological functions and habitat inter-relatedness. It is impossible to completely separate food chains and energy flows in the ecosystems, where "livelihood" in habitat relies on the bordering habitat, as is usually the case between human settled areas and wildlife parks and reserves.

1.2.2 Historical Context of the Problem

Prior to colonial rule Laikipia District was largely inhabited by the pastoral Maa-speaking people and some hunter gatherer groups. The Ndorobo were the majority of this second group. Due to civil wars between the Maasai clans and livestock diseases, both the human and livestock population in Laikipia plateau was low at the turn of the 20th Century. When the European settlers arrived they apportioned to themselves substantial amount of land and pushed most Maasais and Ndorobos out of the present day Laikipia and confined them to the area that is the present day Mukogodo Division (Ndegwa, 1996). This area have the harshest environmental conditions in Laikipia District with highest temperatures being 29^{0} C and rainfall ranging between 400 and 600 mm per year (Hoesli, 1995). The advent of colonialism saw further subdivision of most of the land into large farms and ranches for Europeans settlement. The Africans could reside on the farms only as labourers. Come independence in 1963, the district was opened for occupation and settlement for all Kenyans. Land buying companies purchased most of the large farms following which the farms were then subdivided into smaller family land units with acreage based on shareholding (Hoesli, 1995). The process of land subdivision has initiated environmental conditions, which has created and intensified the conflict between human beings and wildlife. To an extent, there is ethnic conflict between the agricultural communities (the Kikuyu) and the pastoralists (the Pokots and the Tugens).

1.2.3 Nature of the Environmental Problems in Laikipia

The foregoing sets the context and the nature of the problem in Laikipia District generally and the areas where data for his study was collected. Conflicts between humans and wildlife are an important economic and hot political issue in Laikpia district. Presently, over 50 percent of the land is still occupied by large-scale ranches. Land use activities in these large farms is dominated by ranching, while previously the land accommodated wildlife. Small-scale farmers who are primarily involved in the subsistence farming of food crops own about 25 percent of the land. These small-scale farmers do not tolerate wildlife on their small units of land as the animals destroy their crops. Local pastoralists are not affected by the presence of wildlife (Taiti, 1996). The main problems brought about by human settlement-wildlife conflict are: -

1. Presence of a large population of wild animals including endangered species such as the rhino outside protected areas. Table 1-2 presents the most numerical animal species in Laikipia, which according to KWS forms is drawn into the conflict.

Table 1-2 Problem Animal as Seen by KWS and Their Population Size

ANIMAL	POPULATION SIZE
Elephants	3,000
Grant Gazelles	4,000
Zebras	30,000
Thomson Gazelles	4,000
Impalas	6,000
Buffaloes	1,000
Elands	2,000
Heartbeats	1,000

Source: KWS office Nanyuki, 1998

2. Sub-division of land in a fragile ecosystem and subsequent fencing. Following independence ranches in the south of the district were bought for settlement scheme and sub-divided into 0.5-2 hectare farms. Initially such subdivisions were confined in the high potential areas, but later spread to arid areas due to the increase in population (Thouless and Sakwa, 1995). The problem however is that these sub-divisions were not planned for, or is very small plot sizes. The fragile nature of semi arid lands was not used to establish standards to guide the process of land sub-division. Studies on this subject indicates that causes of the intensifying conflict are intertwined with changes in land size units and land use, especially the intensification of farming in small

land units and sedentalization of the pastoralits (KWS, 1996). The other causes emanate from the cultivation of the small land units. Wild animals no longer can access their traditional migratory routes in response to the onset of wet and dry seasons. Thereby the animals are denied their access to some areas that are part of their habitat.

3. Wildlife on the other hand posses a serious threat to the local actors economic means of survival and even their lives. Murama (1990) observes that small-scale farmers continue to cultivate their land as islands of large-scale ranches. Thereby their crops are exposed to continueus destruction by elephants and other wild animals. This problem is serious in Ngobit, Withare, Rugutu and Ndaiga locations. Overall wildlife affects the livelihood of the peasant farmers by destroying their crops by feeding on it, and by causing body injuries and deaths.

4. The local actors bear the cost of the conflict. The loss of property is never adequately compensated because the government stopped the compensation scheme through a parliamentary legislation in 1989. While loss of human life and injury was retained, it is poorly compensated and the compensation itself takes long due to long and cumbersome bureaucratic procedures. Far too many government agencies are involved in compensation or dispute resolution but the agencies are located far apart from each other. Conflict resolution between the government and people affected by wildlife management policies generally and the issue of compensation in particular has, therefore, become politically sensitive.

5. Exclusion of local actors in wildlife management is generally a continuous political and economic issue. It is the responsibility of the Kenya Wildlife Service to sort out the human-wildlife conflict problem because the government has mandated it to deal with the problem. KWS has however failed to effectively handle this problem. Lack of enough personnel is cited as the most limiting factor (Murama, 1990). At Ngobit outpost for example, KWS had only 2 rangers who could not adequately control wild animals in the conflict area.

1.3 Conceptual Framework

This study focuses on the wildlife and human land use activities, where land use activities of farming and livestock rearing are in conflict with wildlife conservation (animals and plants). Species diversity is considered as an indicator of ecosystem stability, and often the most obvious indicators of ecosystem health (IUCN, 1990). Both plant and animal constitutes a pool of genetic resources that are beneficial to human beings. This study takes the idea of ecosystem from this

point of view as crucial in the stability of ecological habitats including the parks and reserves. At the same time the study acknowledges that the government of Kenya have taken measures to protect specific habitats in the form of parks and reserves. Towards this end animal habitat have acquired a legal status so that direct and indirect enjoyment of previously "free" animal and plant resources is controlled and regulated. Whereas the principle of control and regulation is good in itself as it contributes to reducing the number of people who may harm the resources, the control and regulation itself may be viewed with suspicion by poorer members of the society, who may have no political and financial power to assert their influence in the policy.

This explains the ranging debate for and against wildlife conservation measures now being taken in many parts of the world. On the one hand, the protected areas are by no means large enough to contain the wildlife population and their behavioural patterns. On the other hand population growth and economic development are threatening many protected areas. Strictly protected areas cannot be managed to meet society-growing list of recreational needs.

In fact as poverty and inequality in society permeates deep into social inter-relationships, the conflict revolving around policies that favours protection and enlargement of land occupied by wildlife as opposed to that by human being is far from finding even the most moderate answers (WCED, 1987). This brings us to the critical issue of human conflict with nature. But most interestingly however, is the emerging reality that the communities (actors) who are directly affected by wildlife conservation and management policies have the knowledge and will to assert their rights. Actors' perception in the human-wildlife (nature) relationships has evolved as interactions with nature. Part of human actors take action to use resources based on their collective social experimental and learning. While historical documentation show that humanity once lived harmoniously with nature, this trend is no longer the case now. There is a strong recognition that people can damage or deplete the very natural resources on which they depend on for their own survival. Interestingly however, human beings as actors of natural resource utilisation do have their own valuable knowledge on how natural resources should be managed sustainably. When the institutional policy, objectives and actual management style depart from the approach of the actors in the community, a state of conflict obtains which at times manifests in open confrontation.

In reality conflicts are rarely pure as most parties have some common interests and behaviours in addition to which are incompatible. Consequently, conflict is generally 'mixed' and there are areas of co-existence between parties and areas of conflict. Studies have revealed that pastoralism and

wildlife can co-exist, with limited conflict as compared to cultivation and wildlife (Napal and Weber, 1995; and Taiti, 1996).

Conflict can be internal or external. 'Internal' conflict refers to conflict between actors who practice the same kind of activity. External actors refer to conflict occurring between actors of different kinds of activity. In the case of this study internal conflict can be represented by farmers (agriculturists) on the one hand and the pastoralists (livestock herders) on the other, in the case of wildlife conflict is manifested by for example between the ungulate such as Zebra, Gazelles and predators such as Lions and Leopards - conflict between different actors, (external) will be the focus of this study which involves wildlife on the one hand and small-holder farmers on the other.

This study will trace the causes, nature and possible solutions to conflict between official policy and practice of government and its agencies on one hand and a community that tries to propagate a spirit of education in environmentally harsh conditions. Figure 2-1 illustrates the broad conception of the study.

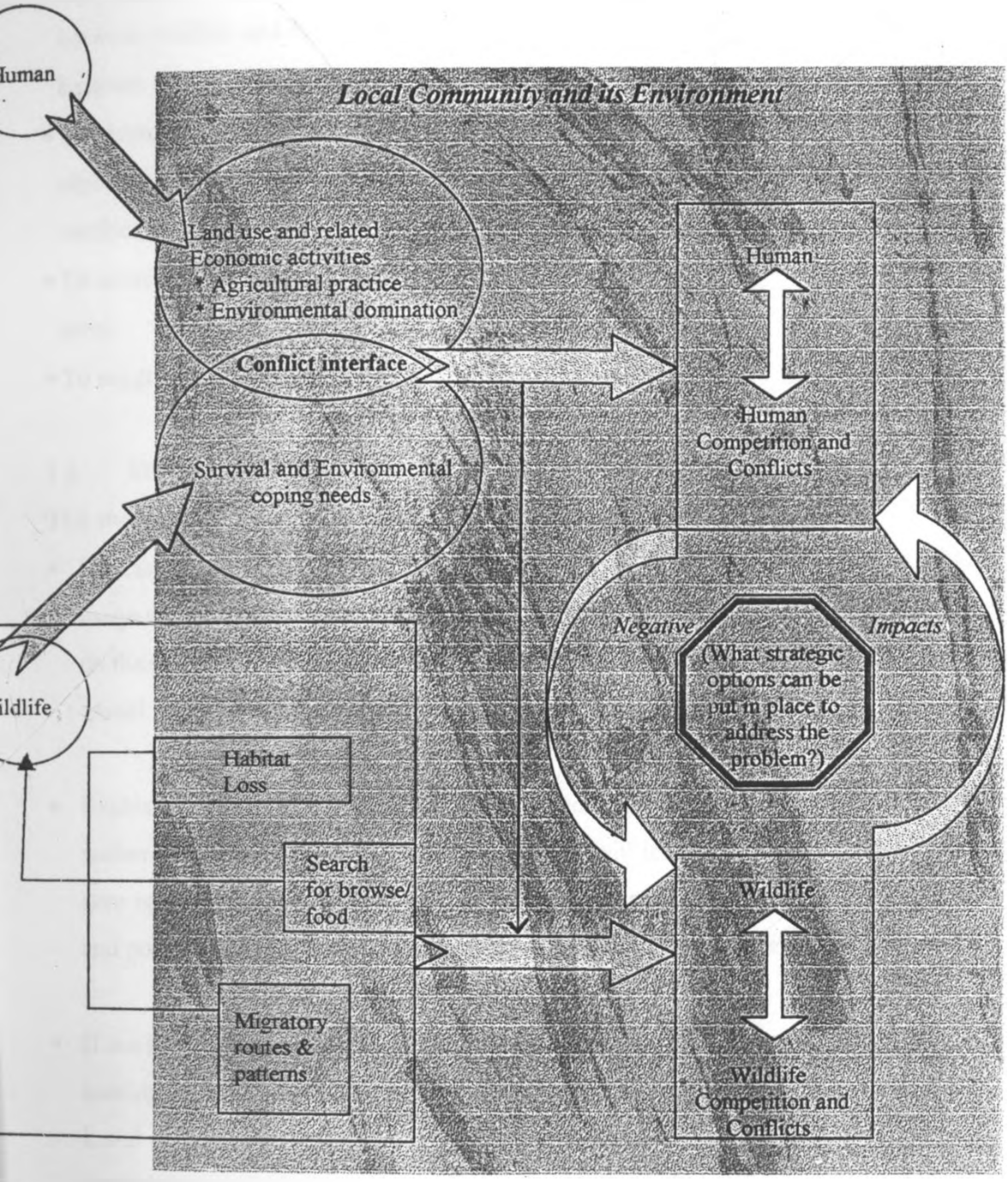
1.4 Research Questions

The study intends to answer the following two questions; (1) can human and wildlife land use conflict in Laikipia District be resolved in the context of existing wildlife management policies, different strategies and perceptions of natural resources? (2) What action or actions are taken by the national /regional actors or agents to resolve wildlife-small-holder farmer conflicts once the conflicts arise?

1.5 Objectives of the Study

The study focuses on human-wildlife conflict as far as smallholder farmers are concerned in Laikipia District. Hence the overall objective of the study is to investigate the types, intensity and effects of the human-wildlife conflicts and to suggest mechanisms for spatial resolution of the conflict. In order to achieve this broad objective the following four objectives will be used to help the actual study in the field.

FIGURE 1-2 CONCEPTUAL FRAMEWORK OF THE STUDY



Source: Researcher, 1998

1.5.1 Sub-Objectives

- To evaluate wildlife management policy in Laikipia District in relation to the co-existence between wildlife and human settlements against the competing claims on land based resources between animals and people.
- To identify the nature of wildlife-human land use conflicts in the selected areas of Laikipia. This objective will help to find out how the government and the concerned communities resolve their conflict(s).
- To asses the effects and intensity of the conflict and identify the most serious ones in the study areas.
- To suggest strategies and measures for intervention.

1.6 Study Assumptions

The study makes three assumptions; namely;

- Increase in population and subsequent expansion of area to include those now under wildlife usage will reduce potential conflict between people and wild animals. The assumption is based on the premise that were all the land to be sub-divided to accommodate human population, there would be not be more conflict between the wild animals and the people.

- Exclusion of local actors in wildlife management and competition for land between the human settlement development and for wildlife habitat will lead to increased conflict. The assumption here is that policy on wildlife management and ownership directly impinges on the economic and political rights of the local communities who live in areas where wild animals are found.

- If conflict is to be resolved and co-existence between wildlife and human settlement achieved, local communities must be directly involved in the design of strategies. The assumption is based on the thesis that the local communities do have their own valuable knowledge on how natural resources should be managed sustainably.

1.7 Justification

Laikipia District is located on the fragile zone of what forms an extensive plateau in Ewaso Ng'iro River Basin. The Maasai people as a grazing area used the plateau. The agricultural productivity of the plateau is low due to severe water shortage. The land was turned into cattle ranching and wildlife game cropping by Europeans farmers in the 1920's and 1930's, both of which thrived on

the natural rangeland with minimum improvement. Taiti (1996) states that despite the fact that no wildlife reserve has been created in Laikipia, wild animal population has remained abundant to this day. The plateau supports one of the largest population of two thousand and two hundred (2,200) elephants and a variety of other wild animals including rhinos in ranches (KWS, 1996).

Although wildlife is retained as one of the land uses, a trend of land subdivision into small plots for intensive farming and sedentalization of pastoralists has led to conflict between wildlife and humans. In particular, the communities who have moved into the study area in the last 30 years have brought with them their experiences from the high potential areas and have put them into practice despite the fragile nature of the ecosystem. The communities' small plots are fenced off and primarily used for cultivation thereby leading to serious conflict with wildlife. As new land owners prefer land that fronts river banks, the fencing and farming activities interferes wildlife migratory corridors which makes the animals interfere with the new emigrants by destroying the fences and crops as they find their way. Consequently, the landowners suffer great losses due to crop destruction by the wild animals.

The government of Kenya has realised that farmers incur these losses from the wild animals. In the 1994-1996 National Development Plan, the government has stated that:

> ... Increased settlement activities have extended into land that used to be part of those seasonal migratory paths and games corridors.

At the same time however, the government has admitted its inability to successfully resolve this continuing land use conflicts, seeing possibilities in new wildlife and land use planning strategies.

The study is justified in that it will seek to contribute to the intention of exploring the problem and suggesting possible ways of managing land use conflict between the wildlife and the people. The study will cover selected areas where the problem is still fresh, and where both official view and perspectives of the local level actors in the communities who are directly affected by the problem tend to use their independent judgement based on their own perceptions to deal with the problem, rather than both parties getting involved to look for the solution collectively.

1.8 Operational Definitions

1. **Conservation:** Conservation in this study is taken to mean the use of both biological and physical resources constituting the biosphere so that the resources yield the greatest benefit to now and to the human population in unforeseen future.
2. **Natural Resources:** Natural resources are those resources provided by nature and not created by man; which are valued by society as a means of livelihood. It is society that creates a value in a particular resource as a matter of social, political and economic objectives in the context of prevailing circumstances. Social and community institutions in the society are influential in defining what is a resource and thus societal institutions are important human environments for resource use planning and management. Resource management will therefore, refer to the means by which resources are organised and utilised to meet human wants.
3. **Actors:** Refers to all those people who directly or indirectly use and control resources. Local actors in the study are local resource users such as individuals; communities and organisations that directly use the resources but do not have direct influence over their distribution and allocation. Those who control and allocate resources are categorised here as deciding actors. Deciding actors include government officers and staff of public corporations such as game wardens employed by KWS. Wildlife will be analysed from these actors' perspectives.
4. **Strategies:** This will refer to consciously designed tactical courses for action to any given situation. For the purpose of this study, all deliberate actions by the said actors in response to natural resource issues are a response to strategizing.
5. **Sustainability:** The study will adopt the Brundtland Commission's definition. In this case, sustainability will refer to development that meets the needs and wants of the present generation without compromising the ability of future generations to meet their own needs.
6. **Wildlife:** Will be used to refer only to both wild animal and plant species.
7. **Wildlife-Human Conflict:** This will refer to any and all disagreement or contentions relations between wild animals and people in matters of land use and the utilisation of land based resources.
8. **Land-use:** Is the interaction between the user and the land itself. Possibilities for the utilisation of land are determined by the condition of physical aspects such as climate relief, soil, vegetation, and water.
9. **Perception:** Refer to local actors knowledge and understanding of what the are key to the context of, attitude, beliefs and norms that are the basis of evaluating available opportunities and causes of action taken, and results expected from the actions.

1.9 Summary

This chapter outlines the purpose of the research as well as the theoretical and conceptual statements of the nature of human-wildlife conflict, conflict formation and conflict resolution. The thesis is organised into eight chapters. Chapter one is an introduction to the subject matter, focusing on study problems, objectives, assumptions and conceptual model. Chapter two outlines the methods used to collect data, types of data techniques that were used to analyse and present data. Chapter three reviews the current literature of wildlife conservation and the paradigms have shaped the thinking and practices from a global perspective.

In chapter four wildlife polices and management practices in Kenya are reviewed. Chapter five describes the ASAL conditions their extent and resource base, land tenure systems and land use practices before and after the wave of population immigration into these regions. Chapter six describes the study area focusing on physical, climatic conditions, wildlife distribution and the specific study areas where data was collected. Chapter seven analyses the primary data that was gathered in the field while chapter seven presents the findings and recommended strategies for wildlife-human conflict resolution.

CHAPTER TWO

METHODS OF STUDY

2.0 Introduction

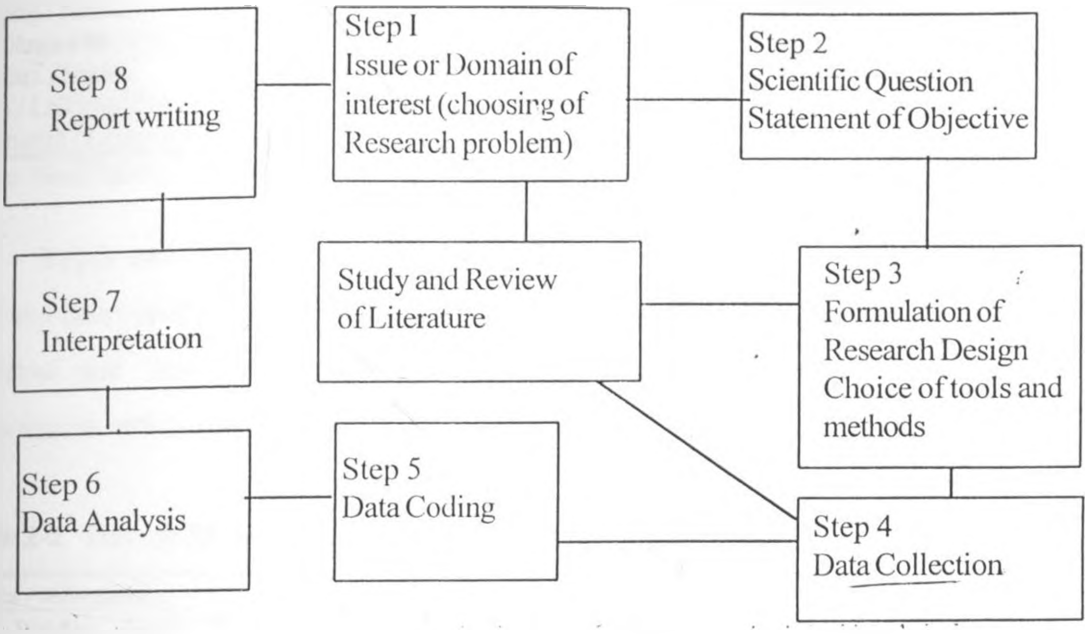
This chapter outlines the methods used to collect data, types of data techniques that were used to analyse and present the data. The chapter also highlights the problems experienced in carrying out the study. Figure 2-1 illustrates the steps followed in carrying this study. Research methodology is an important aspect in social science research. The goal of all social science research processes is to enhance and promote understanding of certain phenomenon. However, the choice of the methodology adopted by the researcher is often influenced by a number of factors. Some of the factors include; the cost in terms of both money and time and the period between when one count himself or herself to undertaking that kind of research and when the output of the research is required by either the researcher himself, herself or his client. The researcher took into consideration these factors among others when he set out to undertake this research.

This chapter gives detailed methods employed during the study. The study followed a systematic order which included choice of the study problem, statement of objectives, formulation of study design, data collection and data analysis, interpretation and finally report writing as shown in figure 2-1. Review of literature was undertaken as a continuous process thus its employment in most of the stages is outlined

2.1 Preliminary Field Survey

As a preliminary exercise it was necessary to take an overview survey of Laikipia district. This was necessary in order for the researcher to familiarise himself with the region at the same time gain good understanding of the field in relation to the research issues. Further, the spatial dynamics of population density, distribution and land use systems were observed as they occur on the ground. During the reconnaissance discussions with key informants namely the Kenya Wildlife Service officials helped the researcher to identify the *problem animals*. These *problem animals* were later to instrumental in guiding the choice of conflict areas. It was also during the overview survey that it was possible map out some of the migratory routes of elephants.

Figure 2-1 Flow of the Research



2.2 Data Collection Areas

The first stage in the selection of the study areas included identification of the most destructive wild animals, their population number (Table 1-1) and their spatial distribution where the researcher relied on aerial counts conducted in 1997 by Laikipia Wildlife Services, Laikipia Research Programme and DRSRS. Possible conflict areas were arrived at through super-imposing different maps showing the spatial distribution of problem animal and land use maps showing areas of small-scale settlements and population densities. Areas where these animals were found and fell under smallholders farming systems were considered as possible trouble spots. This was done through the aid of computer using Laikipia Research Programmes GIS database. Maps used in delineating these possible conflict areas are shown in the appendixes.

The next step was to identify administrative divisions, which fell in the conflict areas. All the conflict areas were considered for data collection. However, this was not possible due to political instability occasioned by ethnic genocide in Rumuruti and Ng'arua. In Mutara /Segera conflict

areas residents were fleeing for fear of possible ethnic violence. This led to the selection of three specific study areas namely, Ngobit/Sirima, Kariunga Mutirithia and Ethi/Laikipia East.

Table 2-1 Possible conflict Areas and their Location

CONFLICT AREA	DIVISION
Ngobit / Sirima	Lamuria
Kariunga / Mutirithia	Central
Mutara / Sagera	Central and Rumuriti
Ethi / Laikipia East	Central
Rumuruti / Laikipia West	Rumuruti and Ng'arua

Source: Field Survey, 1998.

2.3 Types and Sources of Data

Both secondary and primary data was collected. Secondary data is data which is already existing in published and unpublished materials. Table 2-2 shows a summary of data information requirements and sources.

Table 2-2 Data Information Requirements and Sources

Data / Information	Sources
♦ Wildlife species; types distribution and population	♦ LRP data base / Field observation
♦ Forest classification	♦ Mpala Research Centre / Literature / KWS
♦ Land use	♦ LRP, Forest Maps
♦ Population distribution and density	♦ LRP, Land Use Map and observation
♦ Expert opinion	♦ Population Census 1989/ LRP
	♦ Formal Questionnaires / interviews / KWS

Source: Field Survey, 1998.

The role of this kind of data in this study is to help in gaining key insights into the process as taking place in Laikipia, both in physical and human environment, and how these processes are influencing the existing human settlements, land use patterns as well as how the processes contribute into building up of conflicts. The purpose of this is to evaluate government policies and management practices and at the same time, analyse other policy documents on natural resource utilisation and management to infer how the policies influence wildlife management practices.

Primary data is that which is dependent on watching people in their in their own territory and interacting with them in their own language, on their own terms (Valedez and Bamberger, 1994). It was used to collect qualitative type of data and it involved a conscious and systematic sharing of ideas with the respondents in so far as circumstances could allow. The purpose is to obtain data through direct contact and in terms of specific situations in which the distortions that could arise from the investigator's being an outside agent were reduced to a minimum. The aim of this data in

the study is to help in understanding the reality and intensity of wildlife-human conflict as it is construed by the local communities in the study areas and at the same time, investigate the effects of the conflicts.

2.3.1 Primary data

Primary data was collected by use of questionnaires, participant observation, photography, and scheduled interviews with key informants from selected government agencies and ministries and research organisations in the district. It was used in initiating formal enquiry, supplementing and checking previously accumulated data. This type of data was gathered in the field by the researcher as first hand information in the selected study areas. This data was collected in Lamuria, Central, Rumuruti and Ng'arua divisions.

Both open ended and closed questionnaires were used. Open-ended questionnaires were used where new facts were to be searched out and respondents were free to express their views and ideas concerning such questions as "what?", "why?" and "explain". During the collection of data, the researcher had to listen to what the respondents had to say and to be aware of " yes" or "no" answers, which contained no qualitative information. Closed questions were used where categorised data was required and the respondents had to choose an answer from a set of provided questions.

2.3.2 Secondary Data

The sources of secondary data for the study includes government reports such as, the national development plans from 1964-2001, publications that guide policy implementation such as 1976 and 1996 wildlife policy papers. The Wildlife Act cap 376, and Arid and Semi Arid Land development policy among others. Reference is also made to government reports and international documents. These include documents prepared by Kenya Wildlife Service, international agencies such as World Bank, World-wide Fund for Nature (WWF), International Union for Conservation Nature (IUCN) and the United Nations Environmental Programme, (UNEP). Other official records that were consulted include the Laikipia District Development Plans 1994-1996 and 1998-2001. Maps from Laikipia district were referred in connection with vegetation, wildlife and district rainfall district patterns. Official records of wildlife situation in Laikipia were got from Laikipia Research Programme (LRP) Geographical Information Systems (GIS) database, Mpala Research Centre and Laikipia Wildlife Forum (LWF). Existing GIS data were used to identify potential conflict areas.

Literature review involved studying and reviewing written materials related to topic under study. This type of data is important in this study in that it scores the general theory and practice of wildlife management.

2.4 Methods of Data Collection

Each of the three categories of data, namely primary, as well as secondary and literature review was collected. The rest of this chapter will deal with the collection of secondary and primary data. Literature review is presented later in chapter 3.

2.4.1 Secondary Data

Secondary data collection dealt with studying and reviewing of written materials that are relevant to the problem under investigation. This involved the review of published related to the subject under study.

2.4.1.1 Literature Review

In the application of secondary method of data collection, in the review of published literature the University of Nairobi Library, KWS and LRP were easily accessed.

2.4.2 Primary Data

Primary data was collected through administration of interviews, questionnaires, observations, and photography.

2.4.2.1 Interviews

Face to face interviews were conducted with the respondents being asked specific information concerning their interaction with wildlife. A pre-test of the questionnaire to test its adequacy was done which helped in providing guidance on aspects such as probable response and non-response rate. The questions aimed to assess the effects and intensity of human wildlife conflicts, the kind of coping strategies by the local actors, and to identify possible wildlife species for coexistence with the humans. The questions further helped in capturing unrecorded claims for damages resulting from wildlife and local actors' attitudes and perceptions towards wildlife out of their experiences from unrecorded claims.

Questionnaires were applied to 79 households of smallholder farmers living within the conflict areas. The purpose is to gain insights into the strategies they adopt and therefore be in a position to

quantify the intensity of conflict. This exposed the researcher to personal views of the respondents about the study.

Eleven (11) officials representing various institutions were interviewed. The officials were selected on the basis of their knowledge and participation in wildlife resource management in Laikipia District. The interviewees included community-based groups' leaders (CBOs), village committee members of wildlife projects, government bodies officials, Non-Governmental organisations' (NGOs) leaders and private enterprises involved in wildlife management. Table 2.3 has the list of organisations and officials that were sampled for interviews. These were the key informants and in this research context they were understood to be people who are particularly knowledgeable in the topic under study. Interviews were being conducted as free, open and often casual interviews with the respondents after household interview. They proved useful in gaining insight into methods and strategies pursued and applied by those charged with the responsibility of managing and controlling access to wildlife resources.

Table 2-3 Sampled Organisations and The Rank of Official Interviewed

NAME OF ORGANISATION	RANK OF OFFICIAL INTERVIEWED
1. Laikipia Wildlife Forum	Chairman, Secretary and Manager
2. Kenya Wildlife Services	Game Warden, Area Partnership Officers & Rangers
3. Mpala Research Centre	Project Co-ordinator
4. Ol Pajeta Ranch & Sweet Waters Game Reserve	Assistant Ranch Manager Director (Ranch owner)
5. Laikipia West Ranch	Director (Ranch owner)
6. Mpala Ranch	Ranch Manager
7. Borana Ranch	Ranch Manager
8. Suguroi Ranch	Ranch General Manager
9. Solio Ranch	Ranch Manager
10. Ol Jogi Ranch	Ranch Manager
11. ADC farm	

2.4.2.2 Observation

Observation method was a key technique in collecting primary data based on non- verbal behaviour. It involved collection of data via hearing, seeing and touching. It was used to supplement other methods of data collection. The two main methods of observation employed during data collection were participant and non-participant observation. This data was used to ascertain what the respondents said and in the presentation of the findings.

The participant observation methodology involves the use of eyes to accurately watch and take note of the events or phenomena as it actually occurs on the ground. This gave the researcher an

opportunity to ascertain the existence of actual observations, discuss these with the respondents based on what, why and how things are done. Direct observation of wild animal species, destruction of infrastructure and crop damages helped to get a firsthand and authentic picture of the magnitude of the research problem. For the non-participant observer, it was applied in the field through the research assistant who have lived and worked in the area of study since birth.

2.4.2.3 Photography

Photography was used to compliment other methods of data collection. In the course of field survey, thematic photographs were taken to illustrate information about certain wildlife species found in the study areas such as zebras and rhinos among others, damages resulting from wild animals activities that result to the destruction of stores and coping strategies adopted by the community such as scare crows and guard posts.

2.5 Field Sample

The sample chosen was a true representation of the entire population. Approximately 0.64 per cent of the total population residing in an area of 3989 km^2 was covered. This area presents 49 percent of the total land area of Laikipia District.

2.5.1 Sampling Procedures and Sample Size

The study covered the whole of Laikipia District. The total area of Laikipia is 9723 km^2 and the study focused in an area of 3989 km^2, which is 49 percent of the total area. The area has approximately 12,280 households. Seventy-nine (79) smallholders' households were interviewed, which represents 6.4 percent of the targeted population households. Data was collected at two levels. First at the regional (district) level - this helped the researcher in understanding the behaviour of wildlife and to appreciate the context within which conflict in the study areas where data was gathered occur. This further helped to focus on the kind of quantitative and qualitative data needs on the nature, intensity and effects of human-wildlife conflict at smallholder level.

The Laikipia Research Programme projection population was used to project the population. The district intercensal growth rate of 7.3 percent was further used to project the population of the study areas to 1997 (Table 2-4). Kariunga /Mutirithia's household population was at 185 (LRP, census survey 1997) hence, its exclusion from the projections. Several contributory factors were held constant which include; settlement patterns, ethnic violence, human wildlife conflicts and lucrative irrigation development along river valleys.

The sections within the study which have intense human-wildlife conflict are areas neighbouring large-scale ranches, sub-divided plots with low population density (density of less than 25 persons per square km), migratory routes used by elephants and plots bordering or near water sources. Because of these factors further sampling in the study areas was needed as only sections of these areas which had one or a combination of the said factors had conflict between the smallholder farmers and the wild animals. A total of 796 smallholder household population was considered for actual sampling out of which 10 percent (79 households) were interviewed (31 households in Ngobit, 18 in Sirima, 6 in Laikipia East, 6 in Ethi and 18 in Kariunga/Mutirithia). In terms of conflict intensity, types and effects of the conflict there is no big difference since events taking place in all the three study areas are the same.

Table 2-4 Population Projections[2] of The Case Study Areas in Laikipia District

YEAR	SIRIMA	NGOBIT	LAIKIPIA EAST	ETHI
1990	1575	2652	548	450
1991	1690	2846	588	483
1992	1813	3053	631	518
1993	1946	3276	677	556
1994	2088	3515	726	597640
1995	2240	3772	779	687
1996	2204	4947	836	
1997	2579	4343	897	737

Source: Field Survey, 1998.

A list of all the smallholder plots was then obtained from the Laikipia Research Programme GIS data base for this systematic sampling technique. The plots were selected randomly so that each plot had an equal chance of being selected. The first respondent was chosen at random and the next respondent was the selected after an interval of 9 smallholder plots. Where randomly plot owner was not available for interview, any other person within the same household was interviewed as long as the researcher and his assistant found him/her aged more than 18 years. However, in case nobody was available the next household/plot closest was taken to replace it and the same process continued.

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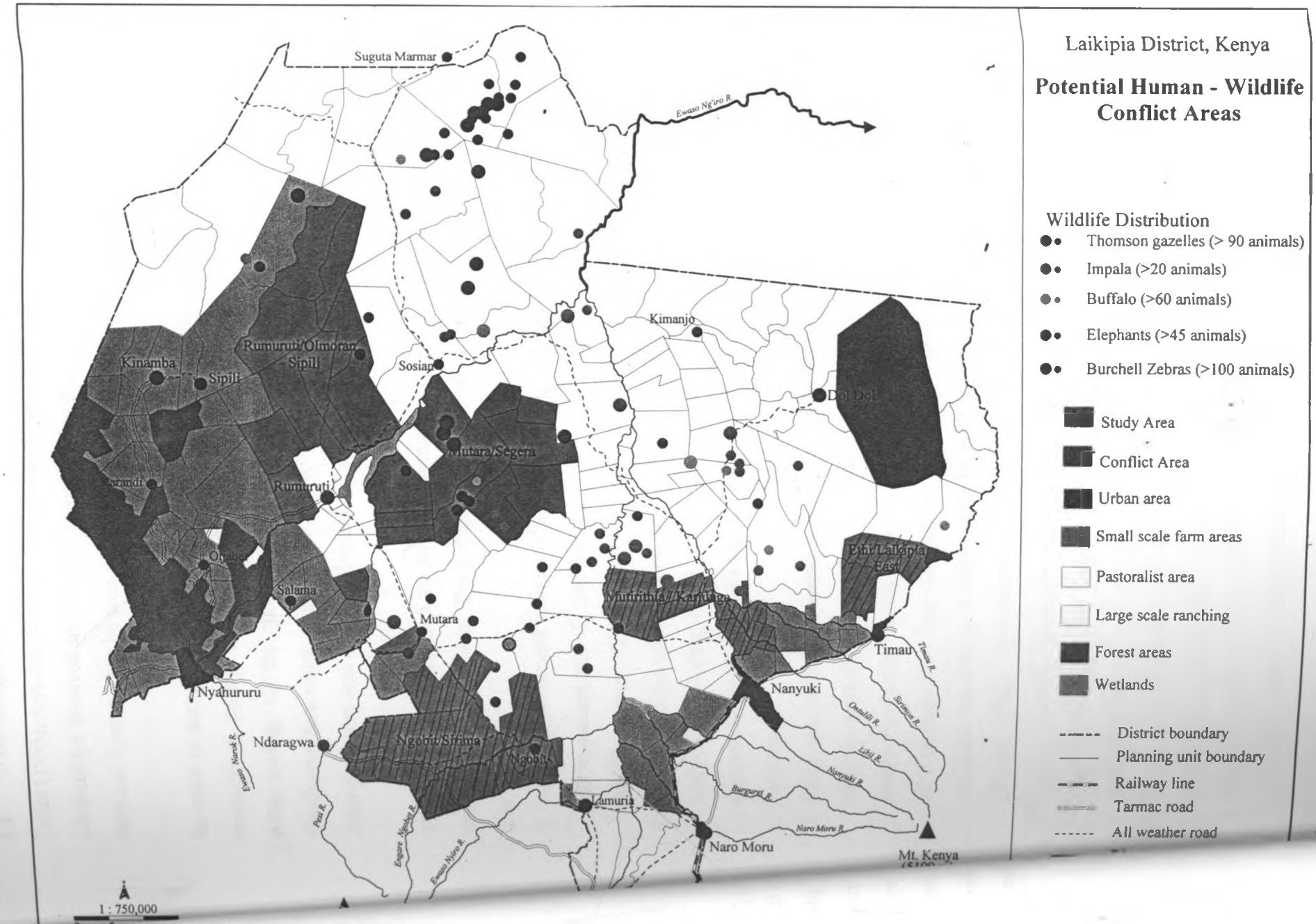
[2] Only half of the population was considered for actual sampling.
Formulae: $Pn = P_{o(1+r)}$
Where, Pn = Population projection in years n
P_o = Estimated population duriing base year 0 i.e (1990)
R = Rate of population growth (natural and migration) 1.e 7.3 per cent
n = Year of population projection.

FIGURE 2-2 CASE STUDY AREAS



2.6 Data Analysis

Goshi (1993), says that the purpose of data analysis is to build up a sort of intellectual model where relationships involved are carefully brought out so that meaningful inferences can be drawn where facts and figures are to be seen in perspective of objectivity.

In order to harmonise data collected from the field, coding of open ended questionnaires was necessary to enable translation of the data into symbols which can be counted and tabulated. After coding, all the questionnaires were then input into the Microsoft Excel Programme. Qualitative data which could not be filtered into useful information was later used in the analysis. After data entry was complete frequencies were generated which enabled cleaning of data.

The second stage involved the statistical summary of the information for easier interpretation and making of generalisation. Percentages, means, range and cross tabulation was used to summarise data;

1. Percentages are used in this study for standardising the data by calculating the number of units and expressed out of one hundred. From the sample of 79 smallholder households in the specific study areas, valid percentages and cumulative frequencies were used in the analysis.
2. The mean is the sum of scores divided by the total number of cases involved. In the context of analysis of this data, mean and average have been used interchangeably. They were used to compute all numerical data inputs like the average family sizes, crop production among other variables.
3. Cross tabulation is a means of recording classification in compact form in such a way to facilitate comparison and show relationships which involves an orderly arrangement of data in rows and columns. In this study this method has been used to describe the extent of occurrence of a phenomenon than studying its correlation. Contingency tables are used to place two variables together in a single table in such a manner their interrelations can be examined (Bailey, 1983). The column variable is normally across the top so that its categories form column vertically down the page. The second variable forms the row variable horizontally. By convention the column variable forms the independent variable and the dependent variable forms the row.
4. Range is the difference between the highest and the lowest scores and it is used for measuring dispersion in interval scales. In this study the range was used as a basis of categorisation of data into various homogenous data by considering the highest and lowest figures. The researcher was able to define the range between each data under study.

5. Existing GIS data was used in the analysis to identify potential conflict areas based on several biophysical and social economic criteria that influence human-wildlife conflict formation. Through the analysis of these criteria, realistic conflict zones were identified. GIS analysis was used in delimiting spatial management areas where wildlife land use can be integrated with human activities and areas requiring total protection from wild animals.

Cumulative and valid percentages were used to show statistical distribution of variables. Household characteristics and other data generated from the analysis were shown by use of tables and graphs. Photographs were also used as well as maps.

2.7 Reliability of Data

There are various strengths and drawbacks that are associated with techniques used and therefore data reliability. First and foremost interview method was very a useful tool into gaining insight into the phenomenon under study directly thus, it was a very reliable method. The method is also more reliable in gathering information about physical ography, institutions and institutional roles. Above all it helped the researcher yield reliable information on factors such as communities' attitudes, strategies, perceptions, opinions towards wildlife. Further its flexibility allowed the researcher to probe some information prior given and illiterate people could answer questions interviewed which was found to be the most characteristic of many respondents.

Questionnaires were designed taking into consideration cost and time that was available time to cover the three specific study areas. The questionnaire method has a number of advantages which include: less pressure on the subject for immediate response, it gives time to the respondents to answering the questions, the questions which are included in the list are standardised, real and create interest to the informant. No administrative arrangement were made apart from the permit required from government and have the targeted population was easily reached.

During the time of the study, a number of problems were encountered which made it difficult to address the study objectives more comprehensively and efficiently. First and foremost, the research lacked the input of other multi-displinary researchers whose contribution would have been important. This was bridged by an intensive library readings on issues of conservation.

Another drawback was the absenteeism by would be respondents since some of the sampled plots were unoccupied or households, or mature members were not at home. In case of absenteeism the next plot was considered.

Due to political instability occasioned by ethnic violence , it was difficult to cover all the identified conflict areas in Laikipia, though the study aimed at covering all the areas. There was a lot of suspicion which made many farmers reluctant to give answers on issues related to human-wildlife conflict, which has been and still is a major political issue. Some respondent confused the researcher with as a Kenya Wildlife Service agent or a spy involved in the political violence despite the researchers clarifying his position as an academician

2.8 Conclusion

This chapter has outlined the methods of research employed in this study and recognises the important role that qualitative and quantitative data play in a social science research such as this one. It also gives a detailed description of how specific data collection areas and the sample size were arrived at. . The chapter also discusses at length various methods of data analysis and presentation techniques. The section further explored the reliability of data collected and the problems that were experienced in carrying out the study and how they were overcome. The next chapters will then focus on the literature on wildlife conservation, human-wildlife conflict and theories of conflict formation and resolution.

CHAPTER THREE

WILDLIFE CONSERVATION AND HUMAN LAND USE CONFLICTS

> Certain cultures in human pre-history and history, although without explicit understanding happened to take shape on lines harmoniously adaptable to the requirements of conservation. For these people cared for the land, its vegetation and its wildlife. (Nicholson 1970;155)
>
> At that time we could and did make great blunders in our treatment of the environment without too serious consequence. If a forest was destroyed or a rangeland turned to desert, there were a thousand forests and rangelands still undamaged. Now the world is small and people are many. Serious blunders can be irrevocable. We have lost most of our margin for error ..... broad environmental approach to conservation is a necessity. (Damson, 1972:3,7).
>
> ..... the protected areas will succeed in realizing their conservation objectives only to the extent that the management of the land surrounding them is compatible with objectives of protected areas. This will typically involve protected areas becoming parts of a larger regional schemes to ensure biological and social sustainability, and to deliver appropriate benefits to the rural population. (IUCN, 1990:12)

3.0 Introduction

The relationship between man and wildlife has a long history problematic issues. However, over utilisation of biological resources by man raised serious issues in the late 20th century when man discovered that these resources have limits. One of the issues is the need to conserve bio-diversity. With the inventory of conservation, man separated himself from the wild animals, by creating "protected areas" that excluded people from certain designated areas that are seen as important in national interest. Due to demographic changes and demand for more land conservationists also seemed to have entered into another era of human-wildlife relationship. The challenge now is how to maintain environmental integrity and at the same time sustain the human resource needs.

This chapter reviews the existing literature on the wildlife conservation. The historical evolution of wildlife conservation from a global perspective to the existing thinking in conservation and practices are traced. In addition the causes and consequences of wildlife - human conflict are described Finally the chapter describes the theoretical context upon which the study is based.

3.1 Wildlife Conservation: Evolution Background

The relationship between man and wild animals is as old as history. Early settlements in Turkey have revealed evidence of bull baiting and games involving people and that date as far back,

10,000 years. This implies complex and sophisticated relationships between man and wildlife that may well have had much earlier origin (Nichson, 1970). Tracing this origin Nichson (1970) further gives evidence of conservation in the Indus valley in India Sub-Content, Egyptian and Mesopotamian civilisations rearing of animals was a common practice. By 7,000 BC early rulers created places which blended the roles of forests and horticultural nurseries, botanical gardens, zoological gardens, game reserves, parks and pleasure grounds where they could relax, reflect, observe, demonstrate, and impress visitors (Nichson , 1970).

The origin of conservation can be traced in Assyria around 700 BC where nobles designated small areas of land to protect certain species valuable for hunting and other purposes. However, no precise date and place is well known where conservation started. Wildlife conservation management strategies before 1800 BC were primarily regulative in nature. According to Nichson (1970) conservation in early time was concerned with preservation of game and hunting ground.

With critical shift in human population pressure and environment especially the adaptation of cultivation, the growth of cities and the industrial revolution, inevitably brought changes. People no longer relied on the local environment but the entire world for their sustenance (Mukii, 1992) This must have led to a drop in wild game and with their effect hunting became associated with royalty and aristocracy.

The movement of conservation received the first public and government support and sponsorship in USA which saw the development of the 'national park' and 'protected area' concepts and the establishment of Yellowstone National Park in 1872 to become the first ever national park in the world. This marked the beginning of the first modern protected area movement (IUCN, 1990). In 1878, California and New Hampshire established fish and game commissions charged with the duty of conserving wildlife (Dasmann, 1973).

In Africa the idea emerged in south Africa in 1898 when Kruger designated Sabie Game Reserve which in 1926 became Kruger National Park which is now the third largest and the richest in wildlife in the whole world (Nicholson, 1970). This trend became very massive and spread to Eastern Africa.

It was in East Africa that the need for international co-operation over standards and legislation emerged and led to the signature in London (1932) of the convention relevant to preservation of Fauna and Flora, which had a bearing on the creation of Parc Albert National Park in the former Belgium Congo, (Nichoson 1970).

Today there are over 4,500 protected areas of over 1,000 hectares each covering nearly 500 million acres (IUCN, 1990). Most of these protected areas are in the developing countries, where human population is fast

3.2 The Concept of Conservation

The conservation concept has undergone several changes. Nicholson (1970) says that conservation has been associated with preservation, implying an effort so far as possible to keep in existence unchanged things or situation which have been inherited from the past. Defence against interference damage or destruction is stressed, the key word for this approach is protection. The other approach concentrates upon withholding from exploitation either against future needs or because they are best kept as they are or because currently available resource managers cannot be trusted to use them.

Thus 'reservation' and areas so treated as 'reserves' such as forests or game reserves. Another approach emphasises on resource management, to safeguard the future of renewable resources through giving paramount to the principle of sustained yield, or securing a balanced blend of several distinct types of economic and social 'crop' insistence on multipurpose use. To this end Nicholson defines conservation to mean

> .....all that man thinks and does to soften his impact upon his natural environment and satisfy all his own true needs while enabling that environment to continue in a healthy working order (Nicholson, 1970: 281).

On the same line of thought Dasmann (1972) defines conservation as the rational use of the environment to provide a high quality of living for mankind. He further says that it involves the planning for and control and use of the environment by man, with a consideration of the long range of human aspirations. Dasmann therefore brings so vividly the consideration of future generations at the same time allowing utilisation by the present generation. Conservation must be linked to development. Development that meets the peoples needs and must not endanger the natural

systems that support life. Probably the best definition is the one advanced by the world conservation strategy which links conservation as part of development it states:

> The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generation. Thus, conservation is positive, embracing preservation, maintenance, sustainable utilisation, restoration and enhancement of the natural environment (IUCN, 1990: 19).

For efficient conservation it needs to be integrated with development. However, the conservation movement has been led by naturalists, and biologists who though their fundamental contributions are unable to address fully the basic problems of conservation because problems are non-biological, but rather political, economic, social and even ethical (IUCN, 1990).

It is no wonder therefore that the basic conventional principles and practices of wildlife conservation have largely involved the creation of national parks and other protected areas, while outside these areas wildlife is conserved through various enforcement activities, including restricting people for instance, from killing wildlife even for the traditional subsistence hunting for example, the only protection of wild animals in Laikipia district is only through the law prohibiting the killing and hunting of wild animals Taiti (1996). The method is expensive in terms of energy, effort and costs both financial and social; what then are the benefits of wildlife conservation?

The value of wildlife looked from a purely economic point of view is difficult to asses. The assessment should not be limited to simply attempting to put a 'price tag' on nature (IUCN, 1990). This however does not mean that conservation has no monetary value. IUCN (1990) classified the benefits into two categories: direct values and indirect values.

Direct values are connected with the enjoyment or satisfaction received directly by consumers of these resources. They are easy to assign prices on them. Indirect values deal principally with, the functions of ecosystems. the summary is provided by the table below.

Table 3-1 Direct and Indirect Values of Wildfire

DIRECT VALUES	INDIRECT VALUES
1. consumptive use value (non market value of firewood and game)	1. Non-consumptive use values (scientific research, bird watching, etc.).
2. Productive use value (commercial value of timber and fish	2. Option value (value for maintaining options available for the future.
	3. Existence value (value of ethical feeling of existence of wildlife.

Source:- IUCN 1990, 28

However, Omondi (1994) summary of the benefits of wildlife conservation and establishment of protected areas offers the best simple analysis as presented below.

Table 3-2 Summary of Benefits of Wildlife Conservation

1. Preservation of bio-diversity for humankind as well as for national and local regions. These include protection of genetic resources, stabilisation of hydrological functions, protection of genetic resources, stabilisation of climatic (the global warning problem and maintenance of high quality living environment - the natural balance environment.
2. .Aesthetic and recreational values: promotion of tourism (often for state, little to the local people)
3. .Scientific research and ministry opportunities - medicine and other products (for example of breeding stocks, population reservoirs and biological diversity.
4. .Natural and regional pride and heritage - preservation of some traditional cultural values. .Sources of food and game trophies.
5. .Employment opportunities - auxiliary services tourist and general local and regional development e.g. road improvements etc.

Source: Omondi, 1994.

Inspite of these benefits the protected area so created have not been able to confine wildlife strictly in these regions. Nicholson (1970) criticises this method since nature abhors a straight line. It is impossible to set aside an area sufficiently large enough to be self-contained, as there will always be spill over between reserve and surrounding areas. IUCN (1990) also acknowledges protected area system as insufficient:

> When the problems are defined in terms of insufficient protected areas, excess poaching, poor law enforcement, land encroachment, and illegal trade, possible responses include; establishing more protected areas, improving standards of managing species and protected areas and enacting international legislation controlling trade in endangered species. All of these measures are necessary. But they respond to only part of the problem (IUCN, 1990: 37).

A situation like this is likely to generate conflict, since it portrays protection of wildlife against people, often treating people as opponents rather than partners (IUCN, 1994). The peculiar reason especially in the developing countries (Africa and Asia) is that parks were established to protect the

larger mammals which attracted international tourism (Gachugu, 1992). Besides, this the park system is alien in Africa and is always linked to colonisation and colonisers false impression on native peoples and their environment. The enormous numbers of wildlife, scarce numbers of domestic livestock and lack of apparent land owner as perceived by the white man created a romantic perception of empty wilderness (Mukii, 1992). Thus these areas were set as reserves either for wildlife exclusively or European settlement.

Since the parks and reserves have failed to contain the wild animals local communities living in areas with wildlife bears the costs of maintaining wild animals outside the protected areas on their lands. Preventing local people from exploiting or occupying protected areas has denied them access to traditionally used resources, besides many people have suffered livestock depredation, crop damages, human bodily injures or death and competition over resources (Nepal and Weber, 1995). This might be due to the fact that parks take control for resource management away from the people who are most directly concerned with maintaining the productivity of the resources upon which their welfare depends.

Another critical issue that the park system brings into the limelight is that, by their very nature, as being legally establishment units of land management, national parks, have limits on the ground, often marked by fences or other physical manifestations of authority. Yet nature knows no boundaries and recent advances in conservation biology has shown that national parks are usually too small to effectively conserve the large mammals they are designed to preserve. The boundary post is too often also a psychological suggestion that since nature is taken care of by the national park, local people can go ahead and abuse the surrounding lands, thereby isolating the national park as an 'island' of habitat that is subject to the usual increased threats that go with insularity.

Inspite of all these shortcomings parks have been one of the most universally adopted mechanism for protection that has been devised in our era. However many surrounding areas are experiencing degradation: partly due to new immigrants into these wildlands who lack applicable and technical practices for the particular ecosystems and those peoples with a long tradition of sustainable resource. In the table 3-3, various systems for categorising protected areas are presented.

Table 3-3 Categories of Management Objective of Protected Areas

CATEGORIES	OBJECTIVES OF MANAGEMENT
1. Scientific reserve/strict nature reserve.	To protect nature and maintain natural processed in an undisturbed state in order to have ecologically representative examples of the natural environment available for scientific study, environmental monitoring, and education for the maintenance of E environment.
2. National Park	To protect outstanding natural and scenic areas of national or international significance for scientific, educational and recreational use. These are relatively large natural areas not materially altered by human activity and where commercial extractive uses are not permitted.
3. Natural Monumental/natural landmark.	To protect and preserve nationally significant natural features because of their special interest or unique characteristics. These are relatively small focused on protection of specific features.
4. Managed Nature Reserve/Wildlife Sanctuary.	To ensure the natural conditions necessary to protect nationally significant species, groups of species, biotic communities, or physical features of the environment where these require human manipulation for their perpetration controlled harvesting of some sources may be permitted.
5. Protected Landscape.	To maintain nationally significant landscapes of the harmonious interaction of resident people and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas.
6. Resource Reserve.	To protect the natural resources of the area for future designation and prevent or contain development activities that could affect the resource pending the establishment of objectives based on appropriate knowledge and planning.
7. Natural biotic area/anthropological reserve.	To foster the way of societies living in harmony with the environment to continue little disturbed by modern technology: resource extraction by indigenous people is conducted in a traditional manner.
8. Multiple - Use Management Area/Managed Resource Area	To provide for sustained production of water, timber, wildlife, pasture and outdoor recreation, with conservation of nature primarily oriented to the support of the economic activities (although specific zones can be designed within these areas to achieve specific conservation objectives).

Source; IUCN, 1990

The new system of categories of protected areas recognises that humans and protected areas can co-exist productively under some management regimes. For example category 5, protected landscape/seascape, includes areas of land, with coast and sea appropriate, "here the interaction of people and nature over time has produced an area of distinct characters with significant, aesthetic, ecological and/or cultural value (McNeely, and Ness, 1995). If wildlife and humans were to co-exist, then the local peoples perceptions to the environment and wildlife must be understood with

an aim to help us in understanding human-wildlife relations. The rest of the chapter will describe the concept of environmental perception by local actors (people living in areas with high wildlife populations).

3.3 Perceptions and Attitudes

The importance of individual and cultural perception of the environment for human behaviour began to be noted in the 1950s, but as a mullet-disciplinary field with some common research problems, environmental perception began to appear in the 1960s (Whyte, 1977). Environmental perception is the interface between individuals and what is happening in their environment. It functions to mediate influence that determines actions that are, or are not taken to modify existing man-environment relationships (Fion, 1977). Whyte (1977) says that environmental perception research shares a paradigm of man-environment relations where individual and collective understanding of the environment is seen as a vital force in shaping the environment through the actions chosen by man and his behaviour. She further says that a perception approach to man-environment relations recognises that for each objective element and relationship in the biosphere, there are many perceived elements and relationships as seen and understood by different people and at different times and places. Man reaches decisions and takes action within the framework of his perceived sets of elements and links rather than any externally defined "objective set". His choice of use or management must be acceptable within his cultural milieu and he must perceive utility in it (Mather, 1986).

Perception is important to us in various ways. One reason is that a firm understanding of the role of perception is valuable for explaining and predicting human responses. (Foin, 1977). Foin gives a second reason by saying that;

> ....environmental perception is one research area where various social and health sciences could be united in an extremely useful synthesis that no single scientific discipline could cover.

Environmental perception as an area of study is a loose confederation of research interests which share a common orientation and philosophy rather than above disciplinary origins (Whyte, 1977).

Whyte further gives a broad objective of environmental perception as to provide a systematic and scientific understanding of the view from the inside out, in order to compliment the more

traditional and external scientific approach. The view from the inside may be that of any individual, of a local community, or even of a whole rural population. The inside view is characterised by familiarity and long experience often coupled with inability to effect rapid changes. In comparing this to the outside view she says that, the outside view becomes associated with development, action and objectivity against internal tradition and resistance to rapid change. Whyte defines "environmental perception to mean human awareness and understanding of the environment in a general sense. It's taken to include much more than individual sensory perception such as vision or hearing.

From the foregone discussion the choice of use or management man chooses is a function of his sociological background which influences his perception and therefore action. Tolba and Khony (1992) concurs with this statement when they argue that what people do depends on what they believe on: their religion ethics or codes of conduct. They argue further depend on what they know and how free they are to act.

Batschart (1996) argues that socially and culturally defined structures and patterns are internalised and determine perception and strategies and therefore individual and collective action. Through its practices the individual reproduces and changes these social and cultural values. The actors are therefore products and at the same time producers of history. IUCN (1990) acknowledges this as a source of information by saying that,

> Rural communities often have profound and detailed knowledge of the ecosystems and species with which they are in contact and have developed effective ways of ensuring they are used sustainably, so information should be collected - especially in tropical countries - about the use that indigenous peoples make of biological resources, and the management approaches they have developed (IUCN, 1990, 73).

The next section will try to review the views and perceptions on wildlife conservation and how that perception has caused conflict.

3.3.1 Perceptions and Attitudes to Wildlife Conservation and Land Use Conflict

> .... communities are repositories of vast accumulations of traditional knowledge and experiences that links humanity with its ancient origins. Their disappearance is a loss for the larger society, which could learn a great deal from their traditional skills in sustainably managing very complex ecological systems. It is a terrible irony that as formal development reaches more deeply into rain forests, and other isolated environments, it tends to destroy the only cultures that have proved able to thrive in these environments (Davis, 1993).

Studies have shown that indigenous communities have co-existed and can co-exist with wild animals. Studies by Lochgan (1993) of the Samburu found that the Samburus do not kill their stock. Further he stresses that the Samburu live in peace with wild animals and that they do not poach:

> We protected the wildlife and we had at least 70 rhinos here. We were living with the animals. If we wanted to kill then we could have finished them completely. The colonials found us here with them. We are aware of all this competition and we don't want wildlife tourism to be introduced, even if it will earn Kenya money which might be used to develop Samburu (Lochgan, 1993, 52).

The Maasai also lived peacefully with the wild animals and have been custodians of wildlife. Wildlife is seen by the Maasai as sustaining the overall economic ecosystem, they have never conceived of wildlife being in competition from land with livestock. It was only after the introduction of National Parks and Game reserves that the alien industry of wildlife tourism created an imaginary conflict between Maasai and wildlife (Matampash, 1993). The mode of lifestyle of these people has promoted their co-existence with wildlife as has been acknowledged by Davis.

> Nomadic pastoralism, which is the mode of livelihood of millions of indigenous peoples in Africa, has been documented as a successful form of animal husbandry, especially in arid and semi-arid environments. By moving between wet and dry -seasons pastures, and by using customary social rules to define such movements, pastoral peoples maximise the chances of survival in a relatively harsh and uncertain environment. Most colonial government and contemporary governments have neither understood nor respected the land use practices of these peoples (Davis, 1993,4).

The Maasai on the other hand rejected the economic practices of other communities while they maintained on their pastoral practices. Hunters, who consumed wild animals rather than conserving domestic stock and lived in the untamed wilderness were viewed as greedy, unrestrained and uncultured, suitable only for slaughtering cattle, circumcising youth, or performing other tasks pastoralists avoided as polluting.

Farmers on the other hand farmers destroyed grazing lands by planting crops in demeaning agricultural labour and they were seen as fit only for providing food, beer and wives for pastoralists (Walker, 1993). The Maasai never consumed wild animals. However, this romantic view does not mean the communities support conservation but on the contrary the desire to protect wildlife is seen as a "white" middle class preserve. For most of the communities pressure of feeding their families educating their children, getting adequate health care, and many other day-to-day needs, takes precedence over what they perceive as the largely aesthetic considerations of rich foreigners.

Further studies done shows that resistance to conservation areas was high and that rural Africa has little interest in wildlife conservation. They belief wildlife conservation was forced on them and maintained for the white man and the educated elite.

The concept of protected areas is unacceptable to local people as noted by a combative Samburu attitude:

> We are not poaching, let them come to the forest and guard the animals but they should not bring that trick of calling it a protection zone (Lochgan, 1993, 52).

Although aware of the connection between tourism and developmental revenue, they fear that if they agree to an area being used for tourism they will be excluded from it. Peoples perception is that the government loves animals more than people (KWS, 1996). The conflict is further deepened in Kenya by peoples perceptions of benefits and costs. Rural peoples perception is that authorities ignore citizens wildlife related losses at the same time denying them their true value of their need and right to use wildlife resources to supplement farm incomes and food supplies. They view the apparent lapse in control of problem animals as avoidance and as part of official wildlife protection policy, rather than as a genuine gap traceable to lack of resources (KWS, 1996).

Matampash (1993) says that the competition for land between wildlife and pasture surfaced when the Maasai came to realise that wildlife could be harvested for tourism income. They noticed further that the state paid more attention to the wildlife industry than to their livestock. Worse still, the Maasai, whose best grazing lands were lost to state promotion of the wildlife in their group ranches without compensation for the land, grass, and human lives destroyed. The Maasai notes Matampash, though serving as wildlife's main custodians receive almost nothing from the industry, causes of this wildlife - human conflict are summarised in Table 3-4.

The serious challenge facing conservationists is how to conserve wildlife in a sea of hostile local interests. If conflicts persist the long term survival of wildlife is under threat. Resource exploitation is generally governed by the perceived self-interest of individuals or groups. Therefore behaviour affecting biological resources can best be changed by providing new approaches to conservation that alters perception of people and their self-interest. Since self-interest today is defined primarily in economic terms, conservation needs to be promoted through economic incentives (McNeely, 1995). The preferred opinion of this study is that there is a need

for an integrated approach solution of the wildlife-human conflict and that under some level of management, human beings and wild animals can co-exist sustainably.

Table 3-4 Causes of Wildlife-Human Conflicts in Kenya

Loss and damage of agricultural crops.
Damage of forest plantation trees and seedlings.
Human beings killed by wild animals.
Loss of livestock killed by wild animals.
Competition with livestock for pasture: overgrazing.
Competition with livestock for water.
Destruction of infrastructure (fences, pipes, works).
Competition for space (protected areas) with communities.
Hosting and transmission of major livestock diseases.
Lack of wildlife utility.
Invasion of urban areas: loss of freedom and security.
Behaviour of KWS ranger: shootings and whippings.
Misconception of KWS as a donor agency, over expectations.
Ineffective techniques for controlling problem animals.
Non compensation for destruction of property by animals.
Inefficiency and abuse of compensation procedures.
Competition and lack of involvement in tourism business.
Uncontrolled animal business movements and migrations.
Conflicts of interest over benefits accruing from wildlife.
Licensing problems among operators of wildlife related tourism activities.
Security/safety of tourists in protected areas.
Policy weaknesses causing uncertainty in potential investors.
Land-use conflicts and inadequacy of policy for resolution.
Illegal limiting and trade in wildlife products.
Denial of a share of revenue and other benefits to stockholders.
Poverty.
Negative social impacts of tourism
Negative environmental impacts of tourism.

Source: KWS, Report of the five-Person Review Group, 1996: 5

3.4 Integration of Wildlife in Human Land Use Activities: A Sustainable Development Approach

A need understand and involve the local actors in conservation management can be the starting point towards sustainable development. as a viable land use option in areas outside national parks and reserves (KWS, 1994). The WCED (1987) says that sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life. Meeting essential needs depends in past on achieving full growth potential, and sustainable development clearly requires economic growth in places where such needs are not met. We therefore can conclude that integrative conservation approaches must take into consideration

the economic benefits to be gained by the local land owners who often carry the cross of the costs of sustaining wildlife outside protected areas through damages of crops, loss of lives, etc.

Integration have a long historical background. The need for integration arose partly from anthropological studies of forest dwelling peoples studies which have undermined the idea that strict protection is necessary to conserve bio-diversity. Many indigenous communities have developed highly adaptive behavioural rules for survival supported by a coherent belief system with a foundation of strongly motivating values that make the challenges of existence in an unpredictable world endurable (McNeely, 1995).

McNeely further demonstrated that biological cosmologies and myth structures together with the ritual behaviour derived from them reflect a set of ecological principles. These principles constitute a system of social and economic rules that have a highly adaptive value in the continuous struggle to maintain a balance between the resources of the environment and the demands of society. He gives the example of Tokano Indians in North West Amazon of Colombia who perceive their environment as man made, transformed and structured by the exploitative activities of their ancestors and given symbolic meaning by them. They conceive the world as a system in which the amount of output is directly related to the amount of input the system receives.

The ethno-biological knowledge of the local people is a structured, disciplined knowledge based upon a long tradition of inquiry that is learned as part of the intellectual equipment for biological and cultural survival. Factual knowledge about biological reality is considered essential to survival because people mostly bring themselves into conformity with nature's unity and they must fit their demand to natures availability's (Nepal and Weber, 1995). Many of them are excellent resource managers under traditional conditions.

Conservation of nature must be seen as fundamental to human existence and the concern of all people everywhere. Biological resources need protection against inappropriate uses and over-exploitation not against people (IUCN, 1990 and Nepal and Weber, 1994).

1. In some situations especially where sustainable utilisation of resources is to be a management objective (multiple use management areas), government may wish to supplement national parks

through efforts at decentralisation of power and responsibility and a return of more resource management to local communities. The example of Central America is given, where native peoples have devised sustainable long term land use practices with aboriculture and wildlife management. Their mixed agricultural and forestry systems produce more labour, more commodity per unit of land, and are more ecologically sound than other practices currently being imposed upon their lands. There are no other land use models for the tropical rain forest that preserve ecological stability or biological diversity as efficiently as those of indigenous groups presently encountered there.

2. Establishment of protected areas that are designed specifically to conserve traditional form of land use that have proven their success over time. For example traditional shifting cultivation in a system that is well adapted to the tropical forest environment, help maintain the biological diversity for the forest, and often provides significant benefits for wildlife populations.

3. Land management that will accommodate the need both to protect habitats from over-exploitation and to ensure that the local people are active participants in conservation activities.

The message is clear, management of a protected area and that of the adjacent land must be planned together, since few protected areas are self contained entities. The establishment of 'transitional zones', in which such activities including uses of natural resources in adjacent land are compatible with the conservation of biological diversity within the more strictly protected core area, are often vital to the integrity of the latter.

Previous management (parks) systems, practices have negatively affected native communities because technical experts seldom invite indigenous peoples to help formulate conservation projects. Native people have unique grass-root insights acquired through decades of experiences with local habitats. Ignoring these insights is likely to bring inappropriate projects with few benefits and high risks to the habitat and the delicate balance that marks traditional resources use.

3.5 Theoretical Framework

The theoretical context upon which the study is based is on theories of in conflict. The theories will provide room for examining the causes and nature of wildlife human conflict, while on the

other hand conflict resolution and conflict management will provide basis for integrating wildlife with human development.

3.5.1 Theory of Conflict, Conflict Resolution and Conflict Management

Conflict refers to the underlying issue in dispute between parties or actors (Zartman, 1989). Cox and Johnston defines conflict as struggle over values and claims to status power and resources. Land use conflict occurs because land resources are limited. (Mather, 1986).

Conflict is always preceded by a crisis. Zartman says crisis is often construed to refer to a short period: implying a sudden flare up. Crisis may also refer to a turning point or a decisive moment. It refers to a change in the nature of the relations between parties (actors) or more specifically, a shift in their power relations. Peperkamp, 1986 and Staps, 1983 explains how conflict arises from a situation of tension related with acquisition or maintenance of access to space can occur when more than one user want to occupy land for a certain location. Such tension can manifest itself in various ways termed as "competition or conflict". The terms both referring to a situation in which the potential users (actors) are aware of the existence of a certain amount of disagreement over the use of access to a particular piece of land.

A differentiation is made between competition and conflict. Competition is where one or more parties (actors) are being hindered while converting their production needs in spatial terms of the other party (parties) without feeling the need or having will to take action against this. Conflict on the other hand, is where one or more parties (actors) are being hindered while converting their production needs in spatial terms, in such a way that one or more wish to take action at the cost of the other party.

In the case of Wildlife and human, conflict occurs at two levels; true wildlife -human conflicts and clashes of interest (interpersonal conflicts). True wildlife -human conflicts are caused by direct interaction between animals and people. On the second level of category includes person to person conflicts between stockholders with polarised group or self interests. Often those disputes derive from competition between groups for resources and dislike of new policies that may affect the power balance of direct benefits away from or toward certain groups. Though both are crucial in this study the study, will be concerned with interaction between animals and people.

Conflict resolution refers to elimination of the causes of the underlying conflict, generally with the agreement of the parties (actors). On the other hand conflict management refers to elimination, neutralisation, or control of the means of pursuing either the conflict or the crisis (Zartman, 1989).

Conflict resolution is a tall order. It is rarely accomplished by direct action and is more frequently achieved only over long periods of time although the proximate aspect of conflict can sometimes be eliminated by agreement among the parties (actors) (Zartman, 1989). In the case of wildlife it is assumed that conflicts are inevitable and that conflict resolution mechanisms should be established in advance to minimise impact of wildlife - related losses (KWS, 1994). Elimination of the causes means total removal of conflict.

Conflict 'management' involves such measures as denying both sides the means of combat, neutralising one party's (actor's) means by slightly increasing the others, separating the combatants in space or time, and so on. In the case of wildlife-human conflict this strategy is manifested by the total separation of wildlife and human beings through creation of parks, usually by fencing. The provision of the legislation to protect animals is included here. Management then, seeks either to prevent conflict from erupting into crisis or to cool a crisis in eruption.

In the application of the conflict theory some assumptions are made in order to make it applicable. While it is easy to refer human beings as actors by virtue of their ability to strategies and plan for themselves it's difficult to perceive the wildlife in this context. Wildlife conservation is not done by the wild animals themselves but by an institution.

Nevertheless, this limitation is not strong enough to prevent studying the wildlife -human conflict from an actors' strategies and perceptions point of view. Since actors' strategies are a function of their perception the study assumes that by analysing the perception of the actors involved (human land use activities) and wildlife from a conservation point of view the gap will be bridged.

3.6 Summary

This chapter aimed at underscoring the current conservation thinking and practices from a global perspective. The protected area system which started in USA by the turn of the 19th Century have dominated wildlife conservation practices all over the world and Kenya in

particular with the main thesis that human and wild cannot live together. The concept in recent years have shown to be unsustainable since it is impossible to contain wildlife within some form of physical boundaries while current data indicates that more than half of the world animal species reside outside the protected areas where they conflict with people on a daily basis due to competition for land resources. Hence modern conservation cannot succeed without involving these local people in the management of wildlife. The next two chapters then gives the comprehensive review of the wildlife policies and management practices in Kenya and consequent transitory settlement patterns and land use practices in arid and semi-arid lands. This provides the link between the substantive and practice.

CHAPTER FOUR

REVIEW OF WILDLIFE POLICY

4.0 Introduction

The government manages in trust for present and future generations nationally and globally the biological diversity represented by Kenya's extra-ordinary variety of animals and plants found in a wide ranging terrestrial and aquatic ecosystems in Kenya. The thrust in which the government manages these resources includes both the communities living close to the different wildlife, Kenyans and the global community.

This chapter reviews wildlife policies and management practices in Kenya. In this study a policy is a general guideline for action that include packaged means and resources to guide actions taken to resolve particular problems facing a society or community. This policy review has adopted historical approach so as to bring out time and policy content perspectives on wildlife conservation and management practices. The three broad historical phases of policy development are; (1) Pre-colonial, (2) Colonial or Pre-independence and (3) Post-independence or Post-colonial. This review also describes how the government and agencies responsible for wildlife conservation and management have responded to the continuing conflict between wildlife and human land use practice. In particular, the programmes that have been formulated to manage conflict outside protected game parks and reserves generally, and Laikipia district will be evaluated.

In tracing the wildlife conservation and management policy in Kenya, three broad areas were explored namely; pre-colonial, colonial/pre-independence and post-independence/post-colonial. The chronology of historical events is presented in table 4-1. In each case, key policy issues are discussed.

Table 4-1 Chronology of Conservation and Management in Kenya

DATE (Approximate Time)	EXISTING CONDITIONS IN THE WILDLIFE-HUMAN RELATIONSHIP	KEY ACTIONS TAKEN
Pre-colonial (Before 1895)	• Relative harmony in the co-existence between small human population, large wildlife population, communal land ownership, less intensive land use, antagonistic attitudes.	• No protected areas, no game control. • Beginning of Arab slave trade into interior, rise of Kenyan ivory trade.
Colonial Era (1893-1963) (1930)	• Beginning of colonial influence, no game control, indiscriminate hunting and shooting for sport, also to give way for settlers agriculture, extraction of natural resources.	• Pioneering Protection-colonial Government responsibility, introduction of game control, game and forest reserves with sports hunting licences in the 1940s. • Preservation through parks-national parks were established by trustees game control sport hunting outside parks under game department. First national park, Nairobi was established.
(1945)		• Anti poaching against subsistence hunters
Post-Colonial Era (1960s-1977)	• Utilisation without management, hunting ban, 1977. Compensation to farmers for livestock depletion.	• Parks managed by trustees until amalgamation with game department. Conservation and management Department in 1976.
(1977-1990)	• Tourism in parks and reserves promoted • No benefits to local people • Poaching anti-poaching	• Ministry of wildlife and tourism in charge of wildlife • Establishment of the Kenya wildlife Service (KWS) 1990.
(1990-91-92-92)	Contemporary challenges • No compensation to farmers for crop and livestock depletion, compensation for human deaths/injuries retained . Alternative of compensation required • Mounting pressure on parks and wildlife outside the reserves	• Compensation to farmers for livestock deletion and property. • Practical experiments on wildlife projects initiated.
(1993-1996) (1997.....)	• Challenge for community participation • Need for practical measures to reduce conflict. • Recognition wildlife benefits by the local people and demand for more. • Poaching and parks and reserve encroachment.	• New focus on reconciliation of conflicts, A new wildlife Policy Paper 1996 formulated.

4.1 Background to Wildlife and Conservation Management in Kenya

In between the main historical eras (pre-colonial, colonial and post colonial , a number of events have taken place and thereby making the government to respond with measures that can help to safeguard wildlife resources. The establishment of the national Parks and Game Reserves constitutes the main approach in wildlife conservation and management in Kenya. Parks and reserves approach is copied from the United States of America (Wandera, 1998). The institutionalisation of approach however took time, and it could help in this kind study to trace the stages it has gone through. The main stages are pre-colonial, colonial and post-independence periods.

4.1.1 Pre-Colonial Period

Before the establishment of the parks and reserves, wild animals in Kenya lived freely in their various habitats and the animals intermingled with human population without visible habitat conflicts.

The wild animals were viewed as a creation of God and also as a source of food for some communities. In some communities only the ungulates such as antelopes, elands and gazelles were hunted for food because they resembled domestic animals. Smaller animals like the rabbits were only hunted by small boys as training ground for future hunting expeditions when they became adult men. Even in hunting the local communities only harvested what was enough to supplement their local diets while the by-products such as hides and skins were used for dressing. Other by-products were worn by elders and used as cultural signs and symbols or as ornaments (Omondi, 1994). In some communities like the Maasai wild animals were never consumed unless in periods of calamities (Campbell, 1993; Matampash, 1993). Maasai men could kill a lion as a "proof " of bravely and "manhood" so that they can be allowed to marry but there was killing of the animals as say for sports, as is often the case now.

4.1.2 Colonial Period

For 50 years from 1850-1900, European influence penetrated Kenya and this is the period that the Arabs who till then had confined their influence at the coast also increasingly gained entry into the interior territory. Initially the European missionaries and traders the to " pacify" the Africans and

the later to explore administrative trading potential, were later followed by the army of administrative officer to establish authority on the territory. Specifically, 1895 saw the establishment of a protectorate, while this changed into a colony 25 years later in 1920.

The import of colonisation process and the establishment of British authority in Kenya brought three main changes in wildlife resources. First the contact between European and Africans introduced diseases that caused great human loss and deaths on African populations. Thereby, large areas hand their human and domestic populations characteristically reduced. This open lands were open for wild animals for grazing but also provided the European with the opportunity to occupy the land as it was "unoccupied". Meanwhile, most land had become a rich arena for ecological bio-diversity where pastoral nomadic communities grazed their livestock among the wild animals in the open without interruption. But the occupation of these lands by the new settlers, their farming technology and use of sophisticated hunting equipment especially the gun, for both food and sporting events introduced undesirable habitat relations between man and animals (King'oriah, 1996).

Within a period of 20 years between 1880 and 1990 the pressure on hunting of the wild animals had affected the animal population, which called the first ever measure taken to control hunting the British East African Company then administrative authority the East African Game Regulations (EAGR) 1900. Before the enactment of the regulations there was no limits on the number that a hunter could kill (Omondi, 1994). The practice was to shoot a large number of each species in the hope of getting one good trophy head. The situation did not improve following which the 'Game Ordinance (rules) and Amendments (GORA) of 1904, and 1906 were enacted in three consecutive years. In 1907 a 'Game Department was formed'. The first protected area was legally set aside in Game Ordinance of 1909. These were large areas constituting the Southern Game Reserve south of the Kenya. The Northern portion of the reserve area was the Northern Frontier Province.

In the 1920s and 1930s wildlife conservation was further entrenched through a ban on hunting of several wildlife species during certain seasons. The area that is now Tsavo West National Park was set aside and made part of the Southern Game Reserve. After the International Protection Convention of Birds was established in 1926 the government moved in swiftly to establish the Game Birds Protection Ordinance (GBPO) of 1926 which was later legislated into East African

Wild Bird Protection Ordinance (EAWBPO) in 1933 (King'oriah, 1996). The 1933 International Conference on Wildlife Conservation increased the awareness of the need for the conservation of wild life resources. During that conference governments agreed on agreement to establish and maintain National Parks and wildlife sanctuaries.

The colonial government in Kenya passed the Ordinance in 1937 for strengthening and improving the law relating to the protection of game animals and birds in the colonial territory. As a further measure in localising the 1933 conference resolutions, a Game Policy Committee (GPC) was formed in 1938 to explore on ways and means as well as identify suitable areas for the establishment of National Parks. Ordinance No. 9 of 1945 under which a Board of trustees was appointed to administer the areas designated as national parks and national reserves. The goal of the government was to preserve wild flora and fauna as objects of aesthetic beauty, geological, prehistoric, historical, archaeological and scientific interest (King'oriah, 1996). National parks and reserves and other game conservation areas were viewed holistically with the value of conservation and maintaining wildlife on the grounds of nature, ecological, aesthetic beauty and educational use.

4.1.2.1 Implications of the Concept of Protected Areas

Following the passing of the Royal National Ordinance (RNO) in 1945, protected areas were established which separated man and wildlife. This was a significant departure from previous wildlife conservation and maintenance policies. From then on animal and man inhabited areas were to be for exclusively for either use. National parks administration was placed under the Trustees of National Parks (TNP), a newly created government agency. On 16th December, 1946, Nairobi National Park was gazetted as the first national park ever to be established in Kenya. Tsavo National Park followed in April and Amboseli National Park in 1948 (King'oriah, 1996; Capon, 1972). Figure 4-1 shows the early wildlife conservation areas in East Africa.

The concept of protected areas alienated the local people from the wild animals and failed to provide the local communities living with Wildlife with the motivation or opportunity to make any economic gains from it. The indigenous people were considered as a source of threat to wildlife. Omondi sums the situation as thus,

> Insensitivity to local needs was exemplified by the anti poaching campaign in Tsavo, which allegedly destroyed the Walingulu society and culture that was dependent on elephant hunting for their livelihood . At onetime about one third of the adult male Walingulu were in prison for poaching. African resistance tended

to entrenched the European view that the people living near parks could not be trusted or given any responsibility for protecting wildlife. Mistrust of the public has coloured official conservation thinking up until the present era (Omondi,1994 pp. 250).

The translation of protected areas into reality created the parks and resources as "islands" of extensive resources where the surrounding human population was excluded from ever accessing. To implement this policy, a police force was trained in military skills to enforce the concept of protected areas. The local people took on their part the areas outside the park as resources they could us, while parks and reserves were for the exclusive use of the European and educated Africans. When Kenya gained independence in 1963, this view on the role of parks and reserves, and the areas outside them was already endangered.

4.1.3 Independence Period (1963-1996)

After 1963, the new African Government intended to implement new conservation policies and programmes to suit their aspirations as well as national socio-economic and political strategies. National Parks of Kenya (NPK) Act Chapter 377 laws of Kenya was legislated. The Government Game Department (GGD) was created to replace the National Park Service (NPS). The two organisations were later merged in 1976 to form Wildlife Conservation and Management Department (WCMD) in the Ministry of Tourism and Wildlife[3]. Emphasis was on land use planning and management as part of wildlife conservation and management practices. "Utilisation" of the wildlife rescues as part management was adopted. The new legislation proposed that land owners who supported the new policy could get sufficient financial incentives to enable the facilitate wildlife utilisation based on sound conservation and management. Thereby, an integrated model of wildlife conservation, management and planning was introduced[4].

The model was first developed through in the Nairobi National Park (Lusigi, 1978). In tandem with this research, the government legalised the sale of game meat to promote wildlife as potential

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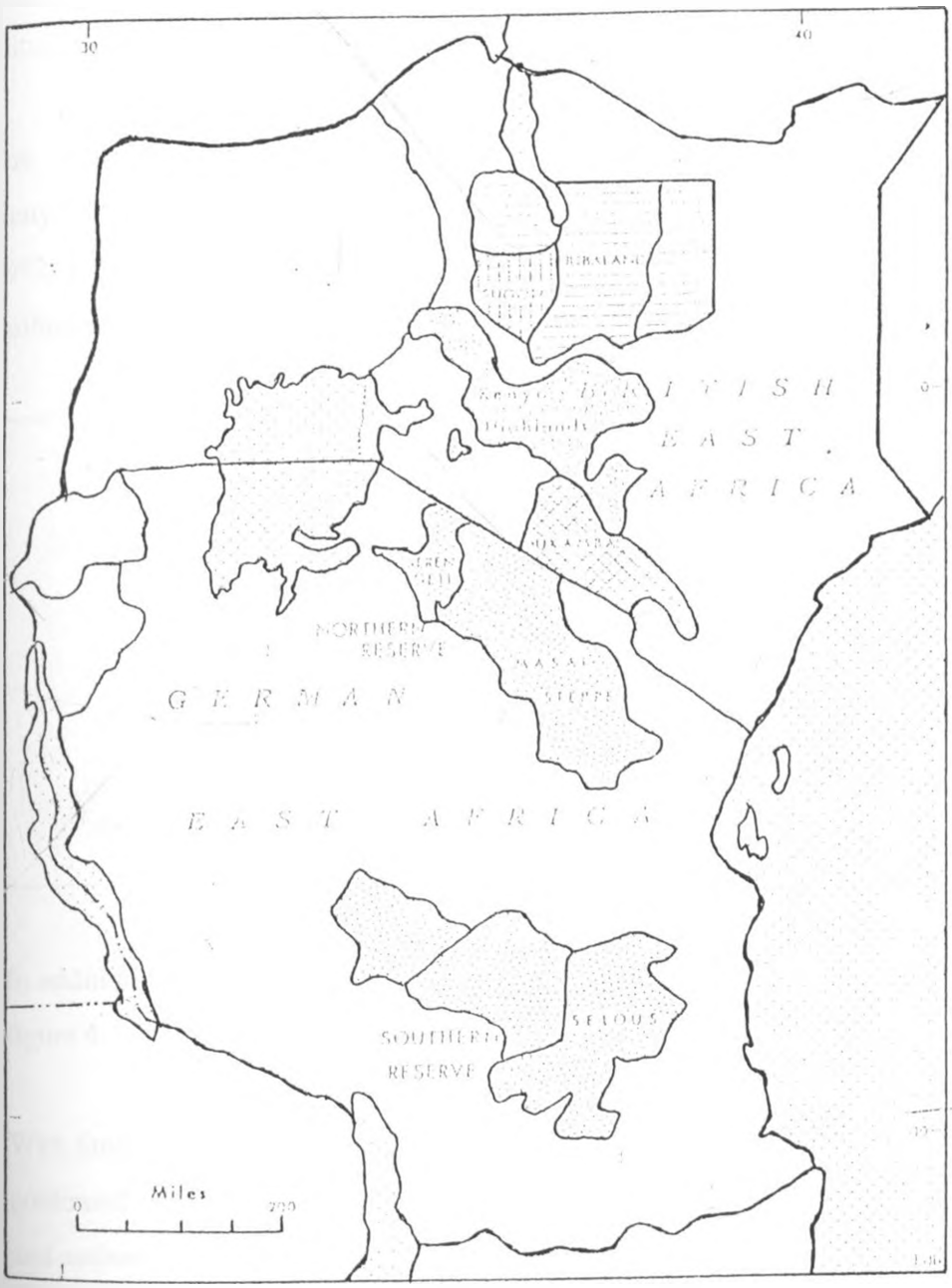
The Act had been preceded by a Sessional Paper (No. 3, 1975) which was a radical departure from the policies preceding it. It not only recognised the value of Kenya's wildlife both within and outside the protected areas but also acknowledged wildlife as viable land use.

Previously in 1975, Sessional Paper No. 3 was formulated. Policies in the Sessional paper departed significantly from colonial government policies in that both the wildlife in the protected areas and outside the areas was equally acknowledged and recognised as viable land use practices.

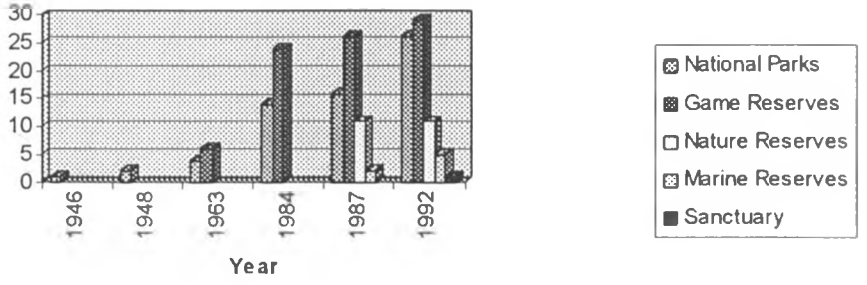
FIGURE 4-1 EARLY WILDLIFE CONSERVATION ARAES



source of protein in the 1970-74 Development Plan. From then on, one of the tasks of integrated park planning was to develop areas in and surrounding the parks taking into account economic and cultural needs of the people (Omondi, 1994)

The 1960s, 1970s, and 1980s saw a considerable growth of national parks and game reserves in Kenya. Figure 4-2 indicates the growth of National Parks and Reserves from 1946 to 1992. By 1992, the country had 26 national parks, 32 national reserves covering a total area of about 4.4 million hectares; which is approximately 7.5 per cent of the country's total area.

Figure 4-2 Growth of National Parks, Game, Nature and Marine Reserves



In addition to parks and game reserves about 3 per cent is gazetted forests. Tables 4-2, 4-3 and figure 4-3 shows the present status of protected area system their sizes and distribution.

With time local people who live in, or around these protected areas were seen as major threat to the continued existence of the wildlife. Currently the main pre-occupation of wildlife conservation and authorities is still to curtail any potential human interference (Wandera, 1998). This threat is real and has been growing by day. Kenya relies heavily on agricultural production to support her economy. The increase of population particularly in the 1970s and 1980s has meant that the majority of the population who rely on subsistence farming have had their small land holding decrease in size further. Wildlife protected and non-protected areas have their attracted attention as alternative sources of land based resources, thereby increasing incidences of conflict between wild animals and the human population.

Table 4-2 Kenya's National Parks

PARKS	DISTRICT	AREA (Km^2)
Nairobi	Nairobi	117
Tsavo East	Taita Taveta/Kitui/Makueni	11,747
Tsavo West	Taita Taveta	9,065
Mt. Kenya	Nyeri/Meru/Kirinyaga/Embu	715
Meru	Meru	870
Aberdares	Nyeri	765.7
Ol Donyo Sabuk	Machakos	18
Malindi Marine	Malindi	6
Watamu Marine	Kilifi	10
Mt Elgon	Trans Nzoia	169
Sibiloi	Turkana	1570
Lake Nakuru	Nakuru	188
Ruma	South Nyanza	120
Hells' Gate	Nakuru	68
Ndere Island	Kisumu	42
Mombasa Marine	Mombasa	10
Mali Kamali	Mandera	876
Arabuko Sokoke	Kilifi	6
South Island	Marsabit	39
Central Island	Turkana/Marsabit	5
Longonot	Nakuru	52
Chyulu	Makueni	736
Kisite Marine	Kwale	28

Table 4-3 Kenya's National Reserves

RESERVES	DISTRICT	AREA (Km^2)
Amboseli	Kajiado	392
Marsabit	Marsabit	1,640
Malindi Watamu Marine	Kilifi	213
Watamu Marine	Kilifi	32
Shimba Hills	Kwale	192
Lake Bogoria	Baringo	107
Shaba	Isiolo	239
Masai Mara	Narok/Trans Mara	1,510
Arawale	Garissa	533
Mwea	Mbeere	68
Rahole	Garissa	1,270
Tana River Primate	Tana River	169
Boni	Garissa	1,339
Losai	Marsabit	1,806
Dodori	Lamu	1,019
Mpunguti Marine	Kwale	877
South Kitui	Kitui	11
North Kitui	Kitui	745
Bisanadi	Isiolo	745
South Turkana	Turkana	606
Kiunga Marine	Lamu	1,019

Nesolot	West Pokot	250
Keiyo Valley	Elgeyo Marakwet	194
Kammarok	Baringo	66
Kakamega	Kakamega	87.7
Samburu	Samburu	44
Buffalo Springs	Isiolo	165
Mombasa Marine	Mombasa	131
Maralal Suntuary	Samburu	200
Kirimun	Laikipia	165
Ngai Ndeithia	Machakos	212
Tsavo Road and Railway	Taita Taveta	112
Kisumu Impala	Kisumu	0.4

Source: Wandera, 1998 pp 5-6

As is the practice, the policies of government and the practices of KWS tends to favour the wildlife in the conflict, citing the following objectives as the guide in policy and practices:-

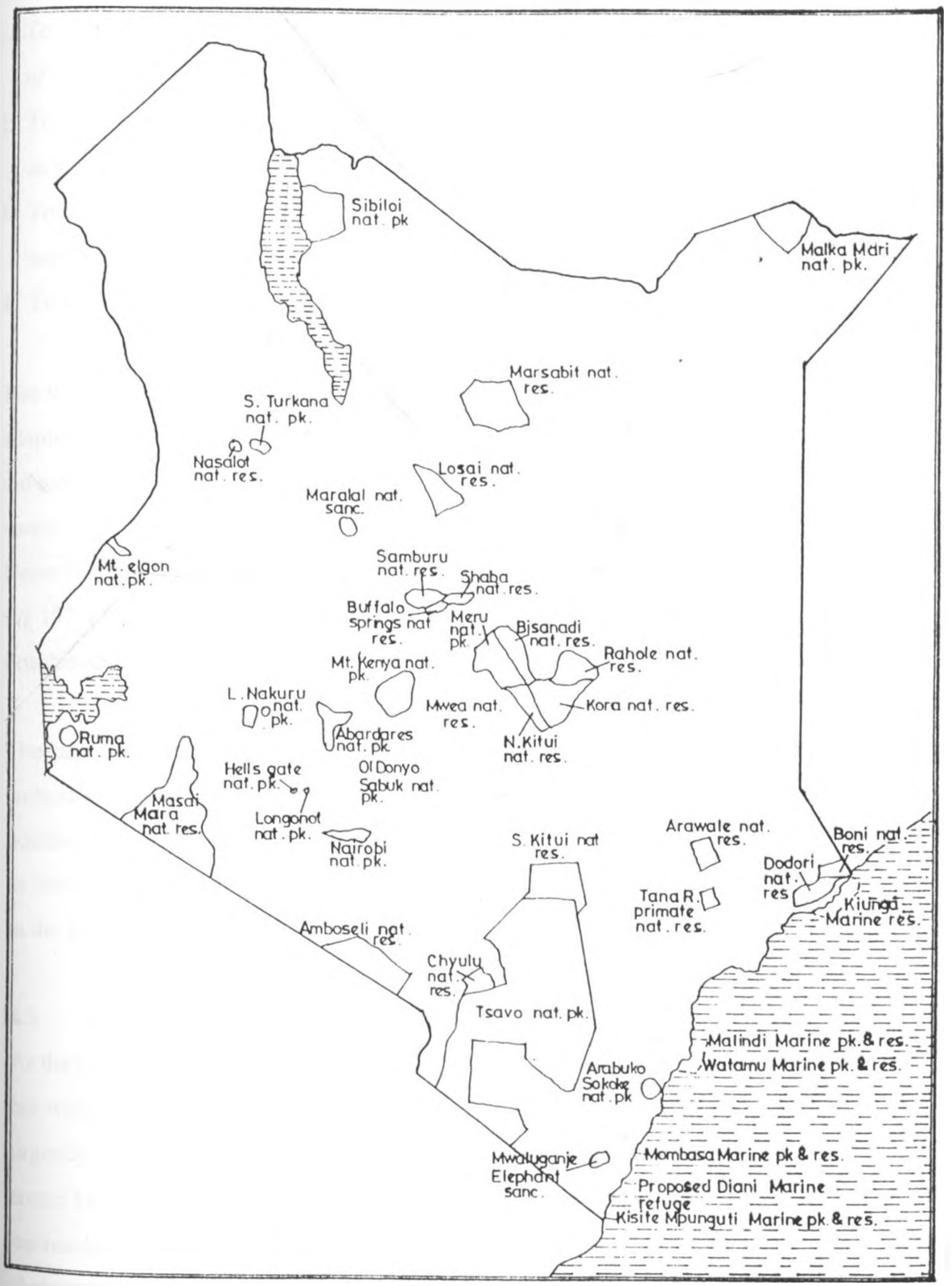
> The economic returns from wildlife conservation which may include many indirect benefits, such as catchment and translocation of animals, future preservation of genitive resources, retention of development potential options. There is a view that both direct and indirect economic benefits are potentially much greater if land use is co-ordinated over a large, ecologically sound area for the wildlife habitation.

The main direct economic return from wildlife comes by way of tourism. Allowing tourism to thrive and prosper would improve the economic prospects of many people, especially those with wild animals in their land. From this perspective unplanned consumptive of wild animals should not be encouraged because it will destroy the environment.

4.2 Wildlife Policies in Kenya

Kenya's commitment to the protection of wildlife is manifested by its large area of protected system. A total of 7.7 per cent of Kenyan land and marine resources is gazetted for strict wildlife conservation and laws legislated to support the conservation practice. The overall objective of gazetting protected areas is to retain the wildlife resources in as much a natural way as the resources has evolved and developed aesthetic, scientific and cultural purposes. The 1975 Sessional Paper No. 3, ***STATEMENT ON THE FUTURE WILDLIFE POLICY*** and the Wildlife Act, 1976 have remained the basis of government policy on wildlife. The Sessional paper in particular demonstrates that he government policy departs from strict protection that advocate the policing of wildlife as conservation measure to integrated conservation and utilisation. The following five proposals are evident in the Sessional paper:-

FIG. 4-3 GAME RESERVES, NATIONAL AND MARINE PARKS



To conserve wildlife areas that are significant components of Kenya's network of parks, reserves and areas where wildlife conservation is in the national interest.

1. To protect wildlife and natural ecosystems from pollution and other intentional damage inform of farming activities that damage wildlife habitat, to direct killing of the animals.
2. To conserve and use wildlife in areas where wildlife is the dominant land use that can be used as viable economic land use.
3. To increase economic and other benefits from wildlife, particularly for people in areas supporting wildlife.
4. To protect people and their property.

The wildlife (Conservation and Management) Act Chapter 376 of the laws of Kenya, that was adapted by parliament in 1976, is principal legislation on wildlife. This law however failed to reduce the conflict between people and wild animals, thereby failing to reflect the underlying issues in Sessional paper. The implementing agency Wildlife Conservation and management Department (WCMD) also lacked sufficient funds required to carry out its conservation mandate. By 1978, the government banned trading in wildlife game trophies in attempt to arrest increased poaching.

The large mammals in particular were affected by poaching and the ban at that time was received enthusiastically world-wide but in Kenya, the new non-poaching policy was not received positively. Further the ban harmonised and integrated desired land use policies and the 1976 Act as intended. Since that time in late 1970s, wildlife habitats and the number of wild animals living in the habitat were degraded with time.

4.3 Formation of Kenya Wildlife Service

As the failure of the 1976 became a reality, more scientific evidence showed that a re-organisation not wildlife conservation and management agency, as well as the formulation of the policies were urgently required. Already the protected areas had become too small to function as ecologically sound habitats for the wildlife animals. Human settlements and associated human activities had encroached to the habitats, such as Nairobi National Park, causing irreparable habitat damage in their wake. Well established wild animal behavioural patterns such as seasonal migration were no longer possible because human settlements had blocked essential migratory corridors.

About fifteen years ago, aerial census of the wild animals by the Department of Remote Sensing and Resource Surveys (DRSRS) revealed that three quarters (3/4) of the large mammals in Kenya live outside protected areas. This fact underscores the importance of the study areas and issues related to the relationship between the wildlife and human land use activities.

These problems led in 1989 to the formation of Kenya Wildlife Service (KWS) to replace the WCMD. KWS was launched as a parastatal body and it enjoyed strong international financial support. KWS management was therefore able to achieve tangible results in park management, anti-poaching practices, tourist security and staff morale. However KWS management and the government have not succeeded to resolve the ever increasing conflict between human and wildlife conflict outside the protected areas, although the conflict have attracted more public interest due to the losses small-scale farmers incur to wild animals destruction of their crops and property. Often, KWS and the government are accused of indifference to the plight of the farmers.

4.3.1 New Focus in Wildlife Policy, 1996

After the Rio-de -Janeiro Conference on environment and Development, in 1992 bio-diversity issues were brought to the attention of a wider public attention, than ever before. The Kenya government formulated a new policy to address the wildlife as a part of the new goal in environmental and development.

The new policy aims at resolving the human-wildlife conflict. In its policy goal the 1996 policy paper stresses for a national policy that will strive to reconcile the conflicting interests arising between those holding divergent views by realizing as many positive values associated with conserving bio-diversity as possible, while reducing the negative impact on those adversely affected. To achieve this the new policy envisages the employment of various approaches including "arbitration's, education, direct incentives to conserve wildlife, problem animal control and benefit sharing. The new policy also notes those who bear the cost of and decide the fate of wildlife, and suggested that they must be the primary beneficiaries. The scope of conservation should be broadened to promote conservation throughout the rural landscape. Benefits accrued to the communities due to the effort communities put in the conservation of biological diversity will be considered as sustainable land use that

compliments farming, ranching, forestry, fisheries, recreation and tourism (Wildlife Policy 1996).

The new policy has three essential points in wildlife conservation and management. First the policy paper calls for a broadened approach to conservation through mobilisation of support of the governmental agencies, local authorities, private landowners, and other competent authorities for co-ordinating and arbitrating the efforts of national agencies concerned directly or indirectly with conserving bio-diversity. Second the paper aims at creating partnership with the said agencies in order to achieve an integrated approach to conservation and development based on co-ordinated land use planning. It is noted however, that this requires a stronger national land use legislation and co-ordination mechanisms. Third the paper puts special emphasis on nature tourism by ensuring security in the conservation areas and providing training for community scouts. This is based on the fact that 80 percent of Kenya's tourist market is drawn by wildlife and tourism industry generates a third of Kenya's foreign exchange.

Despite the content on the policy documents that have so far been formulated, their seriousness is only on paper than on the ground. We wish now to turn our attention to the specific programs being undertaken in Kenya.

4.4 Problem of Animal Control

The government as the owner of wildlife have pledged to resolve conflict through control of the wild animals that negatively impact human life and property. The government however, has delegated this authority to KWS as the main public agency in wildlife conservation matters. In Laikipia District, the most problematic animals which includes elephants, buffaloes and zebras among others are controlled by herding the animals, control shooting, translocation among other methods.

4.5 Compensation for Damage Caused by Wild Animals

Whether to compensate any loss of life or property, when to do so and how much to give is often a political question. The first idea of compensation was applied in the 1950s as fee paid by hunters to District Councils for the use of a controlled area and part of the money went to compensate

people for damages or personal injuries caused by wild animals while the other part was used to develop the local areas and wildlife to promote tourism (Omondi, 1994). With the ban on hunting in 1977 the system was scrapped.

In the 1975 Wildlife Act compensation for loss of human life, or injury or property was guaranteed. However no payment was to be made in case of life being lost in an illegal activity such as poaching. Indirect losses such as diseases transmitted to livestock by wildlife were not also included in the compensation package due to the difficulties that would arise in quantifying and confirming such losses. In 1989, the government passed a bill to establish compensation on property loss from wild animals. At the moment the government can only compensate human death or injury by the animals.

The procedure for compensation requires immediate report to the local KWS station or police station. Claims for personal injury or death must be accompanied by a medical or post-mortem certificate respectively. The area Game Warden is empowered to determine the legitimacy of any claim and also assist claimants to complete a compensation forms. The claim then goes to the District Wildlife Compensation Committee which discusses the claim and either differs it for reassessment at the local level or approves with a recommended amount of money for compensation. The claim is then sent to KWS which once again makes its own recommendations before forwarding the claim to the Ministry of Tourism and Wildlife for payment. Appeal for compensation can be made within 60 days if the claimant is not satisfied.

A flat rate of a mere Kshs. 30,000 would be paid for loss of human life while Kshs. 15,000 is paid for injury. These amounts are very low to make affected families adjust from death or injury of a member of the family (King'oriah, 1996). Furthermore, it takes more than six months to be fully compensated because of bureaucratic nature of the administration of compensation. Besides most of the people who are affected are rural families who have to travel long distances, often on foot to have their claims processed.

4.6 Wildlife User Rights

The Sessional paper No. 3 mandates the government to manage the utilisation of wildlife resources so that to optimise economic and ecological returns. This mandate however, do not require the

government to do so taking into account the interest of the communities living in wildlife area. Safe for motivating people to conserve and use wildlife for economic gain by way of consumptive and non-consumptive use such as tourism by way wildlife viewing, existing policies lacks community-supporting objectives.

Interestingly, consumptive use of wildlife resources allows owners who incur wildlife conservation costs to "harvest" the wildlife, presumably on sustainable basis. Such user rights are based on quotas given to landowners once the landowners have developed a management proposal line with KWS wildlife policies. Harvesting involves shooting for consumption, capture and translocation between farmers for restocking. Any export of live animals is restricted to research purpose. Another consumptive utilisation is bird shooting where birds are shot legally and on licence in both private land and trust land. Revenues accrued are supposed to be directed to communities which is rarely the case. The birds are sold to hotels for exotic dishes.

Game farming is allowed for some selected wildlife species. The programme allows for semi-domestication and husbandry of wildlife such as guinea fowls, ostriches, crocodiles, butterflies, frogs, and quail birds. All consumptive utilisation of wildlife is subject to KWS supervision. Private landowners in the progarmme are required by law to plan and indicate the size of land, wildlife species and numbers involved, the capacity of management involved and the possible uses of the wildlife species involved. This programme is varied for five years, and the farmers must revise or update it thereafter.

Lastly the use rights are granted on condition that the landowner provides to KWS with monthly reports specifying off take by species, numbers and sex; use and disposal of products such as meat, skins, skulls and horns. The and name of commercial cropper or game capture authorised to operate on the property together with a copy of contract drawn between the landowner and the operator must also be given to KWS.

These requirements are by no means cheap to undertake, hence only very well organised groups are able make such an undertaking. Poor farmers cannot be able to marshal the capital and knowledge involved in the enterprise, although game farming is a viable enterprise for smallscale farmers. In Laikipia, this Programme is being managed by the Laikipia Wildlife Forum (LWF),

but its support is mainly drawn from the large-scale ranchers. Smallscale farmers registers their membership through group organisations.

4.7 Wildlife and Tourism

A review of wildlife policy bio-diversity is not complete without a mention of tourism which is the main economic activity directly linked to bio-diversity utilisation (King'oriah, 1996). The importance of tourism to the Kenya government is demonstrated by the contribution the sector makes to the national economy for example in 1993 tourism contributed 36.95 percent of the GNP. Hence, the government's focus and concentration on national management strategies that are limited to the legal status of parks and reserves, demarcation of boundaries providing visitor services, fire control measures, park security and the protected fauna and flora (Wandera, 1998). In the meantime, tourism has evolved to an all embracing economic sector in Kenya. The brief history of tourism development in Kenya is as follows:-

1. In the early 20th Century game hunting started through organisations of individual expeditions. Their increase led to consequent development of local organisations and infrastructure to cater for them. The prospects of making profits from local and international white tourism led to the development of such hotels like Brady's Palm Hotel (1903), New Stanely Hotel etc. to cater for hunting tourists (King'oriah, 1996).
2. Local organisations also emerged to co-ordinate the provision of infrastructure and services to the tourists. The first such organisation came up in 1938, the East African Publicity Association and later in 1948 succeeded by the East African Tourist.
3. Travel Association (EATTA). The later was a semi-official organisation aimed at promoting, fostering and maintaining tourist traffic within East Africa. It also aimed at publicising It also aimed at publicising East Africa as a an attractive tourist holiday resort. Its activities saw an increase in tourist traffic into Kenya and the influx of several international carriers into Nairobi such as BOAC, SAA Air France, SAS etc. with regular flights between Europe, East Africa and South Africa. The development of cheaper air travel in the 1960s led to a dramatic increase in the number of tourists as presented in table 4-4. Over 75 percent of arrivals are holiday visitors (others are business and transit); average length of stay 16 days (18 for holiday and 12 for business visitors) including tourism, business and transit.

Table 4-4 Kenya Tourist Arrivals and Earnings (1967-1990)

YEAR	ARRIVALS (1000'S)	CHANGE (%)	CURRENT EARNINGS	CONSTANT EARNINGS	VALUE OF DOMESTIC EXPORTS	TOURISM AS PROPORTION (EXPORTS EARNINGS %)
1967	225	16.4	NA	46.6	53.5	-
1968	262	11.9	17.3	43.7	57.8	23.0
1969	293	17.1	16.7	47.2	63.3	20..3
1970	343	19.7	18.5	58.3	71.6	20.5
1971	411	-16.1	23.9	68.8	73.2	24.6
1972	345	-2..0	27.3	55.9	90.6	23.2
1973	338	-6.5	24.3	51.3	122.6	16.5
1974	316	2.5	26.5	55.6	162.9	14.0
1975	324	37.7	33.4	60.8	168.9	16.5
1976	446	-22.4	42.9	58.5	268.8	13.8
1977	346	4.3	48.9	70.4	480.3	9.2
1978	361	6.1	60.0	68.4	369.9	14.0
1979	389	1.6	62.0	82.5	385.5	13.9
1980	366	-5.9	82.5	81.4	487.6	14.5
1982	392	7.1	90.0	96.2	513.9	17.8
1983	272	-5.1	118.0	92.1	545.7	16.2
1984	462	24.2	122.0	103.8	633.1	16.8
1985	541	17.1	152.0	125.1	776.0	20.2
1986	614	13.5	197.0	147.0	NA	-
1987	665	8.3	247.0	154.0	NA	-

Source: Omondi, 1994

From the table 4-4, three distinct periods of tourism growth can be identified; the late 1960s, 1976, and the mid 1980s. While tourist the growth of the number of tourists was 5.7 percent per annum, earnings increased 15 per cent per annum. Tourism hence, became a major service industry in Kenya and by 1990s it had surpassed coffee and tea to become Kenya's leading foreign exchange earner. In 1993 alone tourism contributed 36.95 per cent of the total foreign exchange earnings (Sindiga, 1996). The contribution to the economy between 1980 and 1986 with a comparison to both coffee and tea is presented in table 4-5. Tourism in Kenya is mainly based in protected area system which in turn relies heavily on the dispersal areas thus, the governments interest in wildlife conservation.

Table 4-5 Tourism Foreign exchange earnings in Kenya (1980-1986 in Million pounds)

Earnings	1980	1981	1982	1983	1984	1985	1986
Tourism	83	90	118	122	152	209	250
Tea	56	62	78	123	189	189	242.2
Coffee	108	110	114	160	204	231	288.3

In terms of employment generation the tourism industry employed approximately 110,000 people or 8.3 percent of the wage earning population of 1.3 million people in 1990. Inspite of the huge earnings accrued from tourism it is questionable whether the rural people who within the protected areas or in the dispersal areas benefit from these earnings. Almost all revenue generated goes directly to the treasury, while very little is ploughed back into the local regions that sustain tourism.

Unfortunately tourism industry has suffered throughout the 1990s due to political instability and competition from other tourist destinations like South Africa. Unless new strategies, policies and management approaches are formulated to counter this negative form of events, increasing less economic and cultural benefit will be derived from tourism in the next millennium.

4.8 Summary

This chapter aimed at outlining the government's policy and management practices on wildlife in Kenya. In the chapter the history of wildlife conservation in Kenya was reviewed. The major cause in the rift between human and wildlife is due to the lack of concern for the local communities needs. Further the chapter recognised the important economic role played by tourism in Kenya is primarily sustained by wildlife resources in both protected and unprotected wildlife areas. This chapter has therefore tried to link theory of wildlife conservation to the practice. Chapters 3, 4 and 5 that follows focuses on the appraisal of wildlife resources in the arid and semi arid regions where 95 percent of the protected wildlife conservation and management areas are found. This appraisal will show the relationships between the problem and the physical setting of Laikipia District within the ASAL environs as an opening for actual fieldwork.

CHAPTER FIVE

TRANSITORY SETTLEMENT PATTERNS AND LAND USE PRACTICES IN ARID AND SEMI ARID LANDS

5.0 Introduction

This chapter reviews Arid and Semi Arid Lands (ASALs) conditions, describes the extent of the ASALs and explores what defines them, their resource base, land tenure systems and land use practices and as well as the policies that govern the practices before and after the population immigration into the ASALs. Causes of change in land use practice and policies are also described. Finally, the chapter ends with a brief history that explains the actual settlement process by the farming communities from the high potential areas in the ASALs. The major theses advanced here is that ASALs including Laikipia District are in a transitory phase where sedentary human settlements are becoming more and more dominant forms of land use, replacing in their wake, nomadic pastoralism.

5.1 A Global Perspective of Arid Environments

The arid realm covers a third of the earth surface. Arid lands provide home to 15 percent of the world population and also provides much needed habitat home to over half of the world wildlife species (Agnew and Andewson, 1992). The regions are areas of great environmental and economic contrasts containing some of the most important mineral resources in the world. Eighty two (82) percent of iron ore, 79 percent of copper resource and 67 percent of diamonds are sources in the ASALs (Agnew and Andewson, 1992).

While arid lands are resource rich regions, availability of water resources present the biggest challenge to the survival of man and animals in these environments. In the face of increasing human population, the ecological disasters have increased. Besides these areas experience great economic disruption and great human poverty, made even worse by the advance of desert margins. Sahara desert is thought to be advancing southwards at a rate of 9 Km every year.

Table 5-1 Arid Land Populations By Continent ('000,000)

COUNTRY	1960	1985	PERCENTAGE
Asia	151	271	79
Africa	50	97	95
Europe	1	1	-
N. America	16	26	68
S. America	10	18	75
Australia	1	1	-
Total	229 (7.6%)	414 (8.6%)	81
World	3,019	4,818	56

Source: Agnew and Anderson, 1992

5.2 Background Information on the Extent and Nature of Asals in Kenya

The ASALs cover over 80 percent of land mass in Kenya as noted earlier, which means that these areas are characterised by limited moisture availability and a relative rainfall /evapotranspiration ratio (NEO)of less than 50 percent. ASALs in Kenya receive an average annual amount of rainfall of between 150 mm and 550 mm (Kenya Republic, 1982).

The Kenya government has officially recognised ASALs as special resource planning and management areas in its policy document (1979 GOK)[5]. According to the policy, ASALs areas covers 24 administrative districts out of 67 districts. The criteria for identifying ASAL district's is the Agro-Ecological zones (AEZ) (Kenya Republic, 1982). The other criteria that a district falls in the ASALs once 30 percent of land area has less than r/Eo 50 percent. ASALs falls within AEZs IV to VII. Table 5-2 gives a summary of relative rainfall/evapotranspiration ratios (r/Eo). Thus, the ASAL cover about 51 million hectares which is equivalent to 88 percent of the total country[6].

Table 5-2 Area of Agro-Ecological Zone (AEZ)

PERCENTAGE	R/EO	AREA (KM^2)	PERCENTAGE AREA OF KENYA COVERED
Zone IV, Semi Humid	40 - 50	27,000	5
Zone V, Semi-arid	25 - 40	87,000	15
Zone VI, Arid	12 - 20	126,000	22
Zone VII, Very Arid	<15	226,000	46
Total		466,00	88

Source: Farm Management Handbook of Kenya (vol. I - IV) MOA, Kenya, 1982.

[5] Development Programmes for ASALs started in 1986 at which time the policy document 'Framework for Arid and Semi Arid Lands Development in Kenya' was adopted.

[6] Nyaoro, (1998) have put the figures at 490,000 km^2 approximately 83% of the total country.

5.2.1 Population Growth in the ASALs

The 1989 population census estimated the ASAL population at 7,378,000, which is 34 percent of the total population. The intercensal growth rate for the ASALs was estimated at 3.29 percent. In terms of AEZs IV - VII and an estimated 20 percent of the total population live in the Arid and Semi-arid areas of Kenya. The trends of population growth rate vary according to districts. Laikipia (7 per cent), Kajiado (4.87 percent), Isiolo (4.87 per cent) and Narok (6.49 percent). The ASALs have more than 50 percent of the total livestock population in Kenya and also provide home for the majority of the wildlife population. Nevertheless, they are associated with ecologically fragile environments which are prone to degradation partly due to changing land use practices (GOK, 1996).

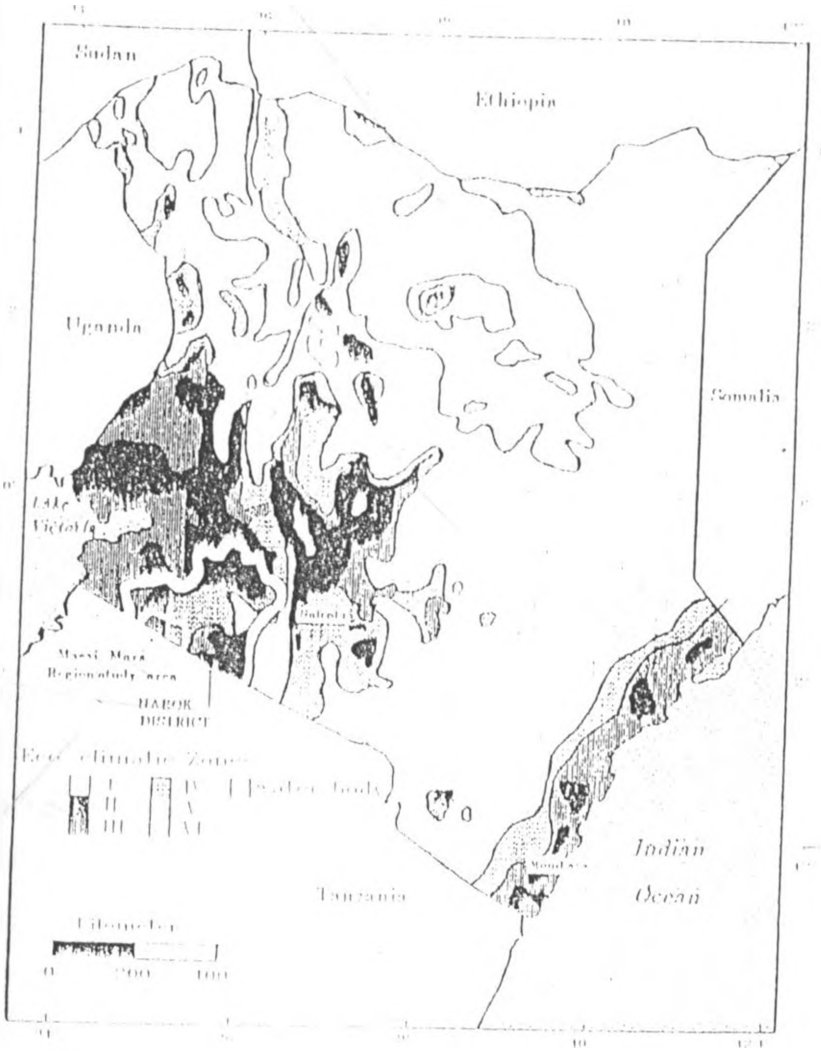
The objectives of government policy in the development of ASALs as outlined in Sessional Paper Number 1 of 1986 aims at improving the standard of living of the ASAL population by integrating Arid and Semi Arid Lands into the mainstream development in environmentally sustainable manner. This policy was further emphasised in the 1988-1993 Development Plan (Kenya, 1986 Development Plan and Kenya, 1988 Development Plan). The Sessional Paper has therefore recognised Arid and Semi Arid regions as presently untapped natural resource for development. Well planned and effectively managed in their utilisation, the resources can be useful in the development of the ASALs and the whole country. However, government policy on ASALs has largely remained mere rhetoric as the awaited jobs, increased household incomes and food production targets remains unachieved to date.

5.3 Influential Factors in Resource Utilisation in the ASALs

ASAL are hot and dry regions. Rainfall is low and highly erratic in both spatial distribution and temporal variability. The rains are also subject to great variability both within and between seasons and often occur as high intensity storms.

Average annual rainfall of between 150 mm and 550mm figures are deceptive in these circumstances because there tends to be a few years of rainfall well above the average. Whilst the 60 percent probability of occurrence is well below 550 mm.

FIGURE 5-1 Agro-Ecological Zones in Kenya: ASALs Fall Within AEZs IV to VII



Soils are generally of light to medium texture and are shallow. The soils are subject to compunction and are susceptible to erosion. Agnew and Anderson (1992), have pointed out that beyond the desert margins land degradation is an even more significant process that too often lead to soil erosion and impoverishment of agricultural systems. The removal of vegetation and the increase in human population are considered the major cause of land degradation. In the very dry areas the soils have problems of salinity and acidity.

ASAL form part of the four major catchment basins in Kenya namely; Kerio, Ewaso Ng'iro, Tana and Athi river basins. All the four rivers are subject to drastic variations of high and low seasonal flows. High seasonal flows are associated with high sediment discharge. The rivers are further regulated by construction of dams and establishments irrigation along river valleys. Except the Tana River, the volume of water in the other three rivers is too small to allow extensive irrigation farming.

The vegetation of the ASAL consists of grasslands, bushlands and isolated forest cover where conditions allow. Natural productivity depends on rainfall and varies greatly over time and space. Though the density of tree and bush cover is low, Hankins (1989) notes they cover 70 percent of forest resources in Kenya. Evergreen forest occurs along the major rivers and provides fuel, building materials and other wood products besides being the principle habitat for most of wildlife animal and plant species. These factors and the variations in rainfall are important determinants of the annual movements of nomadic pastoralists and wildlife populations. The highland and river valleys provide grazing area and water sources for both livestock and wildlife.

Most of wildlife resources in Kenya are found in the ASALs with Wandera (1998), estimating that 90 percent of the protected areas for wildlife conservation are located in the ASAL. Touristic infrastructure is located in the ASAL and therefore, higher portion of national income from tourism is generated there. World Bank (1994) suggests that adventure tourism is mainly a feature of the ASALs because of the spectacular scenery and dominance of wilderness that occur there. Currently, it is estimated that all animals constituting wildlife population in Kenya rangeland is 1,888,558 (Omondi, 1994). Animal cropping would be ecologically permissible although is not practised at the moment.

5.4 Land Use Policies and Practice in the ASALs

Shelter Forum (1995) has pointed out that land is an important asset therefore whoever controls land, controls resources found in it. At the same time land is viewed differently by different communities in various parts of the world including Kenya (Mwangi, 1997). Prior to colonial rule land in Kenya was controlled and used by different ethnic groups based on local culture and social norms. Each community occupied land that suited its traditional land use practices. Sedentarian communities had more or less fixed residence in the high and medium potential areas where they practised agriculture as the dominant mode of land use. In the low potential areas of the ASALs pastoral communities were the main occupants of these regions. These communities practised nomadic pastrolism that borders on transhumance.

5.4.1 Pastoralism

Traditionally, the nomads were dependent on seasonal migration that optimised utilisation of ASAL vegetation and water resources. Land that would be left fallow had time to recover. Through movements of livestock from the drier areas to the wetlands and other dry season-grazing areas, the pastoralists achieved an ecological balance within the ASAL land (Mungai, 1992). This land use activity is more predominant in zones VI and VII which covers some 60 percent of the ASAL. Some of the notable pastoral districts that fall in these zones are Turkana, Garissa, Isiolo, Marsabit, Mandera, Wajir and Laikipia. The districts have the largest number of browsing animals namely goats and camels (Table 5-3). The livestock is highly mobile and graze over wide areas in search of pasture and browse. Hunting and gathering of food is also practiced.

However the present situation is quite different due to various changes that have taken place and interfered with traditional nomadic pastoralism, such as cultivation in depressions along valleys, sedentalization of pastoralists and land alienation (Mungai, 1992, KWS, 1996, World Bank, 1994). Agnew and Anderson (1992) have termed nomadic pastoralists who inhibit the most arid parts as endurers. The essence of this practice is environmental opportunism in that the animals and herders travel together in search of productive grazing pastures following rainfall.

The movements are not aimless nor totally random but follow a regular pattern with some identification of grazing rights for particular groups of people, say a clan. This management system has the effect of rotating the grazing pressure and ensures availability of forage in dry

season. Many wildlife species follow the same seasonal movements which in practice compliments land use practice by pastoralist and their animals. In times of adverse climatic conditions that brings about the absence of vegetation for grazing animals, the pastoralist communities overcome the crisis by turning to hunting of wild animals and gathering available wild fruits. This option is however not sustainable because of the ban on poaching and hunting.

The establishment of group ranches, the demarcation and fencing off of game sanctuaries and individual land parcels in the parks and reserves have deteriorated rather than helped improve livelihood of the people and their animals as well as the wildlife. The introduction of free hold tenure in the ASAL districts have also affected the traditional pattern of movement. These changes have the obvious implication of depriving livestock herders access to resources and thereby creating more pressure on existing livelihood resources.

5.4.2 Mixed Farming

This type of land use is mainly predominant in zones IV and V. Maize, beans and cotton are the major farming systems in zone IV in such areas as lowland Machakos and some parts of Kitui, Embu, Meru and Baringo districts (GOK, 1994 Development Plan). Cultivation of these crops is done in tandem with local breeds rearing of cattle, goats, sheep and chicken. Livestock are usually allowed to graze fields after harvest while animal manure is used by some farmers on their fields. The oxen are used for ploughing while livestock in general are an insurance against crop failure. The average farm-size 7.5 hectares of which 1.5 to 2 hectares under are crop.

In Agro-Ecological zone V, farming system of maize, cowpea, pigeon and pea is practiced particularly in the low lying areas which have been rapidly settled and sub-divided into family farms. Maize is grown but failure is high. Farm sizes are larger than those in AEZ IV but only 2 - hectares are cropped per family per reason.

Though livestock animals are kept, especially goats, about 25 percent of the households do not own livestock and depend on subsistence cropping instead. Animals are grazed communally and are moved away from the homestead area during the dry season. The most suited crop for the areas is sorghum and millet. However, maize predominates because of cultural taste preferences and on the other hand the latter are labour demanding for bird scaring which takes about 50 percent

of total labour output. In Agro-Ecological zones the major crops are sorghum, millet, cowpea and green gram. These crops are found in the drier parts of East Baringo, Kitui, Mbeere, Tharaka, Elgeyo Marakwet, West Pokotan and the interior of Kilifi District. Cultivated areas are very small and range between 0.75 to 1.0 hectares.

Table 5-3 ASAL Districts Livestock Population in 1987 ('000)

ASAL DISTRICTS	BEEF CATTLE	DAILY CATTLE	SHEEP	GOATS	CAMELS	DONKEY
Meru South	263	140	106	96		
Machakos, Makueni	388	34	96	249		
Kitui	304	6	68	535		
Embu	61	37	26	106		
Narok	801	34	436	423		129
Elgeyo Marakwet	101	337	137	146		
Baringo	103	49	129	649	1	3
Kajiado	608	2	500	449		12
Laikipia	217	25	297	267	1	1
Kilifi	169	17	23	160		
Lamu	44	4	8	15		
Taita Taveta	140	9	50	155		
Kwale	223	11	67	131		
Tana River	444		159	293	52	2
West Pokot	170	10	190	120	1	1
Marsabit	315		401	425	227	23
Isiolo	203		178	119	424	52
Turkana	208		720	1080	10	5
Samburu	155		163	253	14	10
Mandera	126		110	714	12	4
Wajir	25		180	220	153	3
Gariasa	693		100	678	61	4
Total ASAL	5,761	715	4144	7283	956	100
Total non ASAL	3310	2287	1245			
ASAL as % of Total	64		64	85	100	100

Source: World Bank 1994.

Livestock are grazed on communal land. Agricultural development in the ASAL has led to serious problems due to the fact that farms do not produce adequate food for the households. While able bodied men migrate to look for work else where, the weak and the old are left to take care of the farms which they are not able to mange productively. Productivity of the farms is therefore low as the menace of wild animals compounding the situation even more. Laikipia District is affected by this double tragedy.

Table 5-4 Levels of Food Crop Production in ASALs

CROP	AREA (HECTARE)	YIELD KG/HA
Maize	200,000	400 - 700
Sorghum	30,000	800 - 1200
Millet	22,000	800 - 1500
Beans	88,000	300 - 500
Cowpeas	20,000	300 - 500
Pegeon peas	30,000	200 - 400
Green gram	15,000	200 - 300

Source: World Bank 1994

5.4.3 Wildlife

As earlier noted majority of the protected area system under the jurisdiction of KWS lies in the ASAL (Table 5-5). Those ASAL areas outside the protected area system form important wildlife dispersal areas that are currently occupied by smallholder farmers. However, encroachment by agricultural activities in these areas threatens to destroy seasonal migration corridors and wildlife dispersal areas. The remaining parks and reserves becoming isolated islands with smaller less diverse and generically poorer population. Table 5-6 shows Species distribution of wildlife outside gazetted parks and reserves by feeding habits in the Rangelands. Over 75 percent of percent Kenya's wildlife population is found outside protected areas which consists of the major wildlife dispersal areas and corridors (Figure 5-2).

Table 5-5 Number of National Parks and Reserves in Kenya

	TOTAL No. OF PARKS & RESERVES (Km^2)	No. OF PARKS &RESERVES ANIMALS OUTSIDE ASAL	No. INSIDE ASAL PARKS & RESERVES
Parks	26	10	16
Reserves	32	3	29
Total	58	13	35

Source: Wandera, 1998

Table 5-6 Species Distribution of Wildlife outside Gazetted Parks and Reserve by Feeding habits in the Rangelands

FEEDING HABITS	SPECIES	TOTAL NUMBER		
		RANGELANDS	PARKS	PERCENTAGE OUTSIDE PARKS
Browsers	Generik	55,600	1909	3
	Ostrich	39,700	3037	8
	Girraffe	77,600	8499	11
	Lesser Kudu	19,200	3637	19
	Rhino	350	189	54

Mixed feeders	Grant's Gazelle	331,100	40,394	12
	Eland	51,300	7,847	15
	Impala	253,700	72,131	28
	T. Gazelle	244,200	88,109	36
	Elephant	30,000	175,00	58
	Gravy's Zebra	7,900	111	1
Grazers	Water Buck	8,200	1,958	11
	Hunters	7,500	1,500	20
	Harvest	138,600	31,879	23
	Topi	74,800	20,357	27
	Onyx	85,600	25,053	29
	Buffalo	59,300	19,839	34
	Kongoni	182,500	73,216	40
	Burchell's Zebra	207,000	112,605	54
	Wild Beeste			
TOTAL		1,884,558	529,788	75

Source: Western and M. Pearl, 1989 pp. 160.

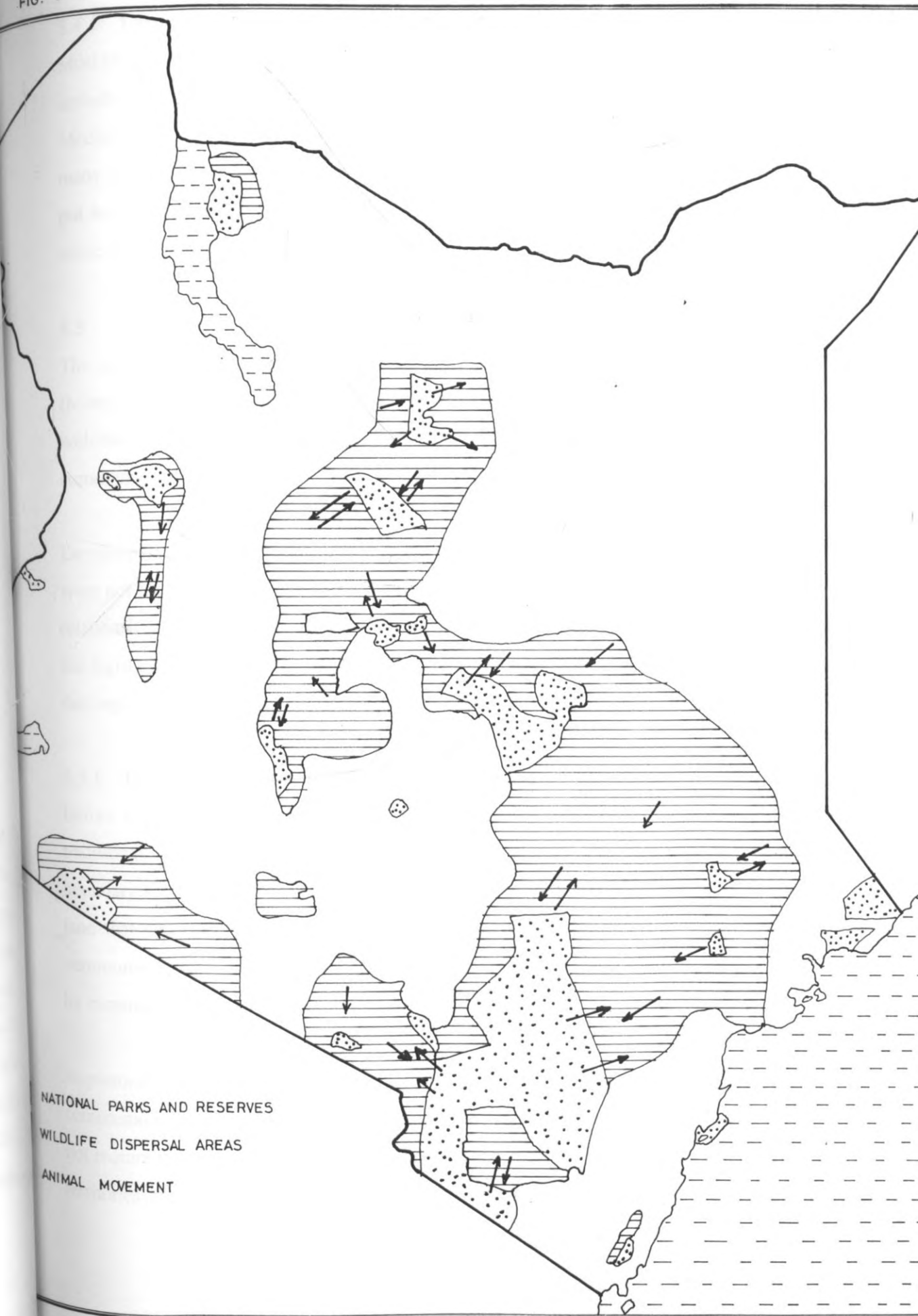
From the table 5-6 the number of Gravy's Zebra number are low in parks because the population ranges widely in Arid northern Kenya, where there are few protected areas. Heavy poaching has increased the relative number of Elephants and Rhinos within parks.

Some of the protected areas are suitable for agriculture. However, majority would be more suitable for livestock grazing due to their extensive range and wood cover. The practice of livestock keeping augers will with wildlife as a land use but with the loss of grazing land, arable farming have threatened the wildlife with loss of habitat and placing man and wildlife in direct conflicts.

Wildlife destroys agricultural crops to the extent that upto 50 percent of the agricultural produce does not reach maturity. Conflicts also arise between wild animal and livestock due to the predatory nature of some wild animal species such as lion, leopard, hyena and the jackal. Others transmit diseases such as rinderpest and trypanosomiasis that are transmitted by a tick carried by the wildebeest and tsetsefly. Tsetsefly use buffalo to transmit the diseases. Conflicts intensifies during draught periods when pastoralists do not have access to forest resources. Recent trends indicates that there is increased fencing of privatised land. This has tended to block migratory routes of certain wildlife species. The situation is already evident in Laikipia District and Shimba Hills in Kwale District. KWS has already moved in with community conservation and wildlife utilisation programmes as a conflict resolution strategy but on experimental basis.

FIG. 5-2

WILDLIFE DISPERSAL AREAS AND CORRIDORS



5.4.4 Large-scale Commercial Ranching

Most of the commercial ranches were established during the colonial days. Most of livestock kept include goats, cattle and sheep. Beef cattle are reared mainly for export to major urban centres. Modern methods of livestock are practiced with many fenced paddocks. Wildlife is tolerated in many of the ranches but some ranches have private game reserves within their ranchers and have put holes and lodges for tourists especially in Laikipia. Most of the big ranches are owned by white Kenyans while others are owned by multinational corporations or private companies.

5.5 A Historical Perspective of Land Use Policies in the ASAL

The management of ASAL natural resources has seen various approaches from government (Mungai, 1992). During the colonial period forced de-stocking was often used but was not popular with the nomadic pastoralists. Infact this method was seen as a way of impoverishing the ASAL communities.

Development policy in Kenya has changed fundamentally since then. However these changes were not matched by changes in the legislature and therefore there exists an inconsistency in the relationship between the law and development policy of the ASAL. To understand the nature of the legislation and therefore policy of the ASAL it is necessary first to look briefly at instruments that regulated land use during pre-independence time, before 1963.

5.5.1 Instruments Regulating Land Use in Pre-independence Era

Before colonial rule land in Kenya was accessed by different ethnic groups through their in-built traditional mechanisms. Farming communities have always had fixed residence and identifiable boundaries for individual and community territory. In this form of sedentary life homesteads and land that was cultivated for subsistence were clearly established. The neighbouring land was communally owned with the grazing rights being based on customary laws subject to the control by community leaders.

In pastoral nomadic communities who occupied most parts of the ASAL the land was owned on communal basis as is most of it is at present time. The seasonal migration of the pastoralists does not require the establishment of the boundaries. The pastoral communities therefore, lived in vast territories of land. Even national boundaries were meaningless to pastoral needs of man and

livestock. All these have changed for both the farming and the pastoral communities, with the later experiencing impacts from the changes. The responsibilities of traditional institutions are now taken by the state, first during colonial and lately by independent government. This has meant the breakdown of traditional institutions with weak modern institutional base.

5.5.2 Land Resource in the Colonial Period

Huge tracks of agricultural land were granted to European settlers and private corporation under freehold titles. Some land was given out on leasehold certificates for up to 999 years. The 1908 Land Tittles Ordinance was used to legitimise the sub-division of the country into registrable interests. The 1915 Crown Lands Ordinance (CLO) was another legal instrument used to set aside land for Africans. Areas where Africans had a right were in three categories namely:

1. Temporarily set aside for specific tribes.
2. Native settlement Areas for the settlement of African Groups, families and individuals.
3. Native household area settled by African. Africans could get lease but the land could also be transferred to no-Africans. This land is the proginator of trust land.

Any other land outside the above three categories and the Crown land was classified as category "D" land. In this category anybody had a right of occupying the land but the Governor had a right of altering the boundaries of land area so occupied. The implications on this was that it resulted into the alienation of land from the ASAL communities and compromised their way of living and resource utilisation based on transhumance. In the African Reserves existing communal laws were left to operate but with rapid population growth land reform was inevitable which saw land adjudication programme within the trustlands, settlement programmes and the individual initiative through company and co-operative farms that have purchased and sub-divided former white settler farms after independence.

5.5.3 Land Use Policies in Post Independent Kenya

The legal instruments relevant to the ASAL areas are general and sectoral for the regulation of any particular activity, or for the exploitation or utilisation of one particular resource. The legislation also lack consistency and merely provide for the making of legitimate decision. They lack a framework of compulsion and obligation to take action. Thus there is an overall legislative framework for the conservation of the ASAL. Some of the laws include important provisions for

the protection of environment. First the Agricultural Act (cap 318) which contains important provisions for soil conservation protection of catchment areas and control of Land breaking. Under it, if the minister of Agriculture considers, that a given land use type is detrimental to the general interest of an area he may prohibit such land use types. Second, the Forest Act (cap 358) recognises the conservation of forest which is in line with the Wildlife (conservation and management) Act (cap. 376) providing important provisions for the protection of vegetation and habitat.

Thirdly, the Planning Act (cap 363) provides a facility which can be used for environmental protection through land use planning. Through a local authority and finally the minister for Lands and Physical Planning can identify certain land and subject it to land use planning. Other important legal provisions include the Water Act (cap 372) providing for the protection of water catchment areas and the crop production and Livestock Act (cap. 321) through which empowers Local Authorities to make by-laws for purposes of prohibiting the grazing of cattle in agricultural land, regulating the number of livestock to be kept and compulsory reduction of livestock.

5.5.3 Land Tenure Systems in the ASAL

There are three main categories of land tenure systems in Kenya, namely; Indigenous or customary, modern and government land tenure System and the ownership of land. These systems of land tenure reserve themselves into five holding of property holding. These are: trust land, absolute proprietorship, freehold land, group ranches and government land.

All these systems of land tenure are found in ASAL. However, the most extensive tenure regime in ASAL is customary. This was land under the former Native Reserves, but at independence this land became Trust Land and was vested in the respective county councils which held the land in trust for the benefit of the residents of the areas of their jurisdiction. However, once the land is consolidated and registered as individual holding it ceases to be trust land. A few ASAL areas have been declared to be adjudication districts and the process of adjudication, consolidation and registration is going on. This means that the communal tenure is turning to individual tenures in many parts of ASAL.

Another significant regime property holding is the Group Ranches[7]. Group ranches will remain an important legal devise for organising land in the ASAL since on the one hand not all group ranches are sub-divided and they will continue to be owned and administered according to the provisions of the land (Group Representatives) Act (cap 287). On the other hand the idea of "private ranches" has entered as a device for organising land in the ASAL which are propelled by the highly developed private ranches in Laikipia and Kajiado Districts.

From this analysis, the legal instruments for the ASAL provide only a framework. Thus they are inadequate in addressing the main problem of ASAL which is sustainable resource utilisation. Here "changes" of land use practices in the ASAL can be classified into two; "problems" emanating form Law and policy, lack of comprehensive planning for the exploitation of the ASAL resources and the growing sedentarization of the ASAL population.

5.6 Lack of Comprehensive Planning for the Exploitation of the ASAL

Laws related resource utilisation and management in the ASAL if they address the main problem which is sustainable resource use. The present situation is a legacy of continued reliance and on outdated policies that are primarily concerned with resource allocation and exploitation, and not effective conservation and management. Though a framework exists for land use planning in the context of practicability is not compulsory and there are no standard laws set for utilisation of land. The AEZs are not recognised in law and thus the zones cannot be enforced as legal basis of planning in the ASALs.

5.7 Growing Sedentalization of the ASAL Population

Cultivation has become a more significant land use system in the ASAL in the recent past. This has been facilitated by new immigrants and the sedentalization of pastoral communities. Some ASAL districts especially Laikipia, Narok and Kajiado are now experiencing tremendous high immigrations from the high potential areas (Kumzi 1996 and Taiti 1996, KWS 1996). In Laikipia district former large-scale farms and ranches have been sub-divided and occupied by small-holder farmers having previously purchased through Co-operatives societies (Taiti, 1996). These changes in land use patterns have resulted into fierce land use resource conflicts with wild animals.

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[7] Government policy after 1990 states that no more such groups ranchers be registered.

5.8 Summary

The analysis in this chapter aimed at showing the point of departure from the overall situation of the ASALs and determines the direction of this study. Hence, the next chapter features the background information as a link to the human-wildlife conflicts in Laikipia district. The intention was to show the relationships between the problem and the physical setting, the regional resources and as a source of economic profile and opening for actual fieldwork.

CHAPTER SIX

LAIKIPIA DISTRICT AND CASE STUDY AREAS

6.0 Introduction

This chapter deals with the description of the study area focusing on the physical characteristics of land, climatic factors and how these influence human settlement patterns and distribution of wild animals. A detailed account of wild animal species found in the district, their distribution and, their numbers is also given. Land use changes that have occurred in the district will be described at length and how the changes have contributed to the human-wildlife conflict. An outline of the case study where data was collected including Kariunga/Mutirithia, Ethi/Laikipia East and Ngobit/Srima is finally given.

6.1 Physical Setting, Location and Size of Laikipia

Laikipia District is one of the fourteen districts of the Rift Valley Province the largest administrative unit in Kenya measuring 173,868 Km^2. The district is bordered by Samburu district to the north, Nyeri to the south, Isiolo district and Meru district to the south east. Nyandarua to the south western and Baringo and Nakuru districts in the West. The lies between latitudes 36^0 and 37^0 27 ' East and between longitudes 0^0 17 ' south and 0045 ' north. Laikipia district covers an area of 9,723 square kilometres (KM^2).

Table 6-1 Area of the District by Division

DIVISIONS	AREA IN KM^2
Lamuria	17,31
Central	2258
Rumuruti	3498
Mukogodo	1166
Ng'arua	1070

Source: Laikipia District Development Plan 1994/96

6.1.1 Topography and Geology

The greater part of Laikipia consists mainly of a level plateau, bordered by Mt. Kenya in the East, and the Aberdares mountains and the Rift Valley escarpments in the south and west. In the north west, the plateau descends into the Rift valley while in the north and east it falls into a flat-slopping plain that is part of middle Ewaso Ng'iro Basin. Laikipia plain is drained by the

tributaries of River Ewaso Ng'iro which have their catchment in the slopes of the Aberdares and Mt. Kenya. These tributaries flow in the South-North direction and includes Nanyuki, Rongai, Barguret, Segera, Naromoru, Engare, Moyuk, Ewaso Narok and Ngobit rivers. The flow of these rivers indicate that the district slopes gently from the highlands in the south to the lowlands in the north.

There are two swamps that are of regional hydrological and ecological importance in Laikipia. The first one is along Moyot River valley and is located in Ol Pajeta Ranch, locally known as *Marura Swamps*. The second is located north of Rumuruti Town and this one forms the *Ewaso Narok Swamps*. Topography play an important role in determining economic activities including human settlement development. The south western part of the district has the highest potential for forestry and mixed farming, especially in Marmanet area. The area is also the most densely settled. The eastern part is suitable for grazing while the flat plateau between the Rift valley and the Mt. Kenya massif is the ranching and wildlife region.

The existing rivers are vital sources of water consumption by both the domestic animals and the human as well for the support of irrigation agriculture. The rivers also, are sources of water for wild animals, particularly during dry seasons, and availability of this water explains wild animals migratory routes.

6.1.2 Climate

As noted, Laikipia plateau consists of rolling plains, that are drained by numerous perennial rivers from the mountains. As the rivers flow down slope, they cut out steep rocky canyons. Although Mt. Kenya is situated to the south east of the district, the mountain is not administratively located in Laikipia. North-eastern area of the mountain is more rugged and with rocky outcrops. The attitude of the district vary between 1800 meters in the north and 2100 meters and in the south. The highest point is 2600 meters at Marmanet forest. Other high attitude areas occur at Mukogodo and Loldaiga hill (Figure 6-1). Due to its low lying position, Mukogodo is comparatively dry and is mainly used for pasture land except for the mountain slopes and forest zones.

The equator pass through Laikipia but temperatures are not as high as one might expect. The high attitude moderate the temperatures which means that annual temperatures range from 37^{0}c and

20°c. Western and Southern parts have cooler climate with the coolest month being June. The hottest month is February. Mukogodo Division is the hottest administrative area with mean monthly temperatures ranging from 17.1°c to 23.2°c. High temperatures hinder agricultural activities other than pastoralism. In Lamuria Division mean monthly temperatures are fairly uniform 19.0°c to 16.0°c. Communities living in this area practice small scale farming and keep some livestock, especially dairy cattle. Variations in temperatures play a role as an indicator for the possible distribution of in the pastoralism, large-scale farming and ranching.

6.1.2.1 Rainfall

Rainfall distribution is partly influenced by the vicinity of the mountains. At lower slopes footsteps of the mountains rainfall rapidly increases with increasing altitude and is usually more than 750 mm/year. The western part of Laikipia is more wet while the Eastern and Central are drier receiving between 600-750 mm/year. Seasonal distribution of rainfall in the district is as a result of the North and South eastern trade winds, the inter Tropical Convergence zone and Westerly winds in the middle troposphere in the months of July and August. Long rains occur from March to May and the short rains in October and November. The high mountain areas of Nyandarua range and Mt. Kenya form an exception as these areas receive rainfall in other periods because of the influences of the trade winds.

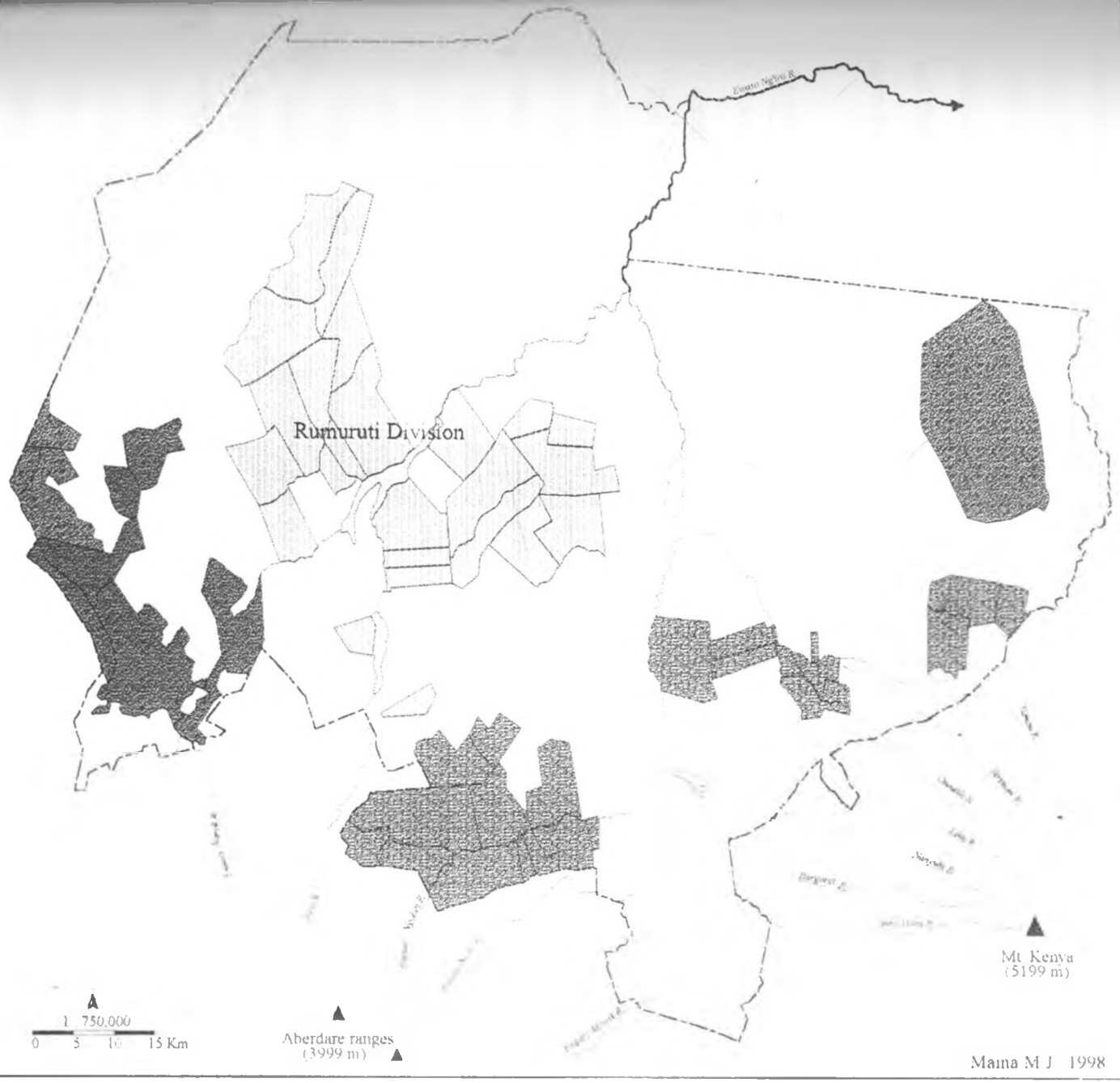
The original vegetation pattern is closely related to hydrology and soil conditions. Footslopes are covered with dense evergreen forests. On the plateau, the vegetation is sparse and usually consists of bushland and grassland. Topography, hydrology, soil and temperatures determine potential for local agriculture. Rainfall is the most determining factor, with temperature and soil conditions modified by topography. Figure 6-2 shows the spatial distribution of Agro-Ecological zones in Laikipia district.

Specifically, rainfall distribution determines agriculture and livestock farming. On the slopes of Mt. Kenya and the Aberdare ranges with 900 mm rainfall, there is crop production and forestry. The Eastern side and the South East receive rainfall of between 700-400 mm and is more suitable for ranching with less farming activities. The amount of rainfall drops as one moves further to the east. This area is occupied by the ranches with beef cattle and sheep being dominant livestock. Nomadism is practised and livestock keeping is the most suitable activity in this area.

FIG. 6 - 1

Laikipia District, Kenya

Physiological Map



Forest (disturbed)

Forest (intact)

Swamps

Conflict Area

Study Area

District boundary

River

Source LRP Database, 1998.

6.1.3 Vegetation

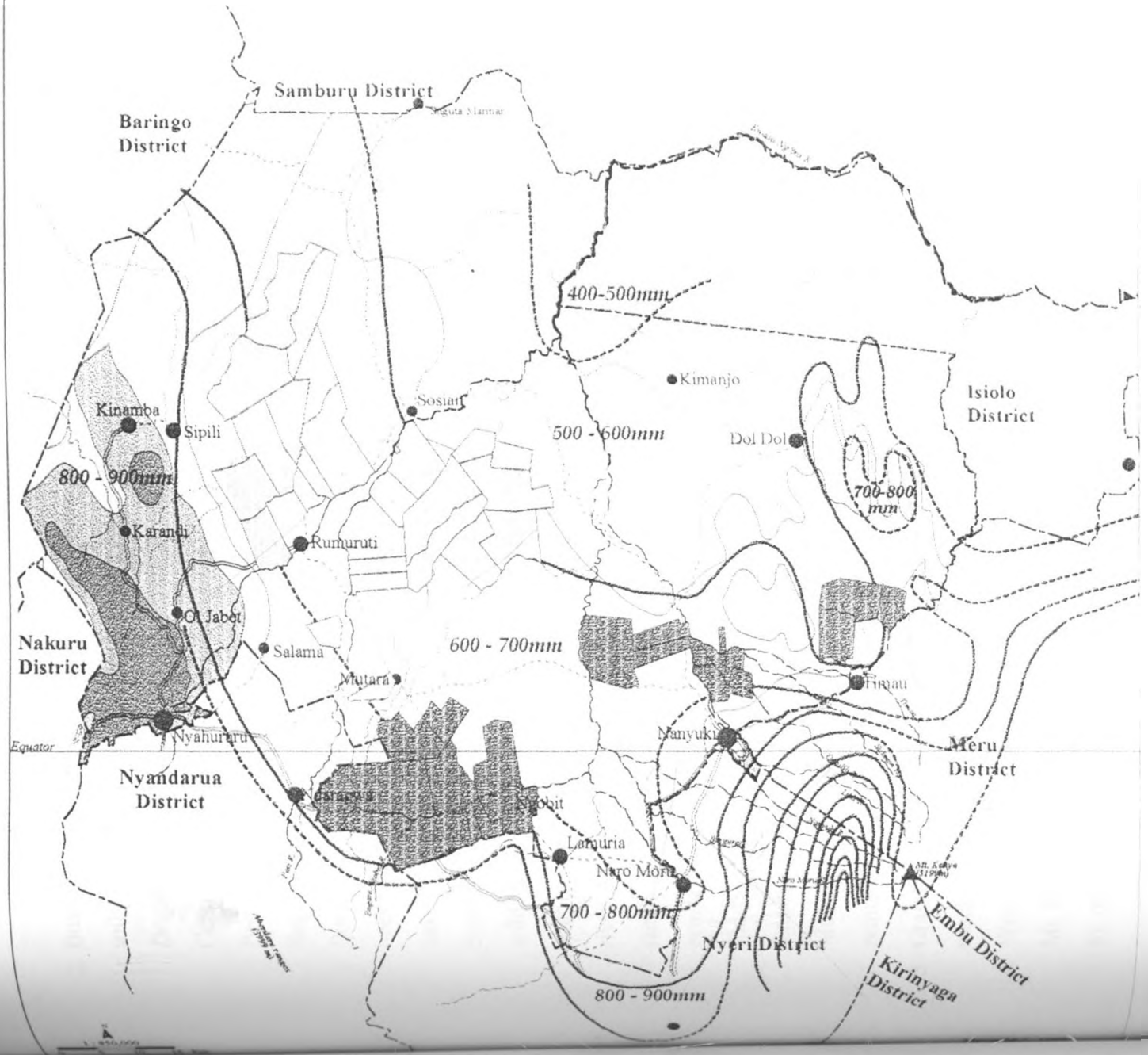
Vegetation cover is mostly influenced by the climatic conditions. The distribution of vegetation is scientifically influence by soil and climate. As principal resource natural vegetation direct and indirect contribution to the economy and environmental well being can be summed as; grazing for livestock, cover for the earth and habitat for wildlife (Taiti, 1992). Natural vegetation is a major factor in influencing the distribution of migratory patterns of wildlife. Between 1900-1960 when extensive land use mainly ranching predominated the entire district, natural vegetation had remained in a state of relative equilibrium throughout without trounce for many years. However in the recent past the ranches are being gradually transformed into high density rural settlement and small scale agricultural holdings, hence the relative ecological balance is no longer possible. Without vegetation the ASAL environment is usually fragile and susceptible to rapid degradation and therefore the main source of food for the wildlife is ultimately destroyed. Vegetation is the main source of wildlife food and habitat for them.

Natural ecosystem in Laikipia districts is composed of various types of vegetation:-

1. Forests: Consists of the upland and plantation forests. Upland forests are aver green forest communities forming the characteristic vegetation of the drier leeward side of high mountain of East Africa. The forests are generally poor in species of large trees and in undergrowth. In the Laikipia district the main bodies of upland forest are found on the Marmanet ridges in West Laikipia where parts of it have been protected as natural forests reserves such as Ol Arabel, the Marmanet, the Ewaso Narok, the Lariak and Rimuruti forest Reserves. Simiral forests can be observed in the Mukogodo mountains, Ngare Ndare forests and the western footline of Mt. Kenya between west of Noru Moru and North of Timau slopes into the drier plains as narrow strips of riverine forests. These forests fair well in red, deep, well drained and fertile soils. They thus face the danger of extinction for agricultural settlements. About 50 per cent of the original gazetted forests have been placed under agriculture through political patronage. Traditionally the upland dry forests have provided valuable dry season grazing for the pastoralists and the wildlife. Plantation forests includes the gazetted forest and cover a total area 67,184 hectares, which is approximately 7 per cent of Laikipia district. Gazetted Forests in Laikipia include Loriak, Ol Arabel. Ewaso Ng'iro, Mukogodo, Ngare Ndare and Lusoi. During the last ten years a huge amount of forests have been cleared without an equivalent rate of planting.

FIG. 6 - 2

Laikipia District, Kenya



Mean Annual Precipitation & Generalised Agro - Ecological Zones

Agro Ecological Zones

- Zone II (Wheat Maize - Pyrethrum Zone)
- Zone III (Wheat (Maize) - Barley Zone)
- Zone IV (Cattle - Sheep - Barley Zone)
- Zone V (Lower Highland Ranching Zone)
- Zone VI (Upper Midland Ranching Zone)
- Conflict Area
- Study Area

Mean Annual Precipitation

- Isolines of rainfall (mm) - broken lines are either uncertain or transitional
- River
- District boundary
- Road (Tarmac)
- Road (All Weather)
- Railway
- Center

2. Bushland: This is limited in the poorly drained seasonally water logged leafy, gravy, vertisolic soils in flat or slightly depressed topography at the medium altitudes of 1,000-1,800m. *Acacia Drepanolobium* species are the most dominant, locally referred to as *ruai*. They dominate Central division of Laikipia particularly the southern part from Solio Ranch in South east to Pesi river and northwards through the plains of Sweetwaters in the east through Ol Pajeta, Ereri, Segera and Mutara and further north to the Ol jogi , Kimugandura, Kamwaki and Kisima, Borana ranches in Ngare Ngare Ndare catchment area. It is the most important plant for honey bees and the pioneer bee keeping co-operative societies in Laikipia district the Ruai bee Keepers have been named after. It is also an important browse for both livestock and wildlife. *Acacia Seyal* s another specie of bushlands that is found in Laikipia and is an important habitat for wildlife being an insect-infested on the branches and twigs. It is also associated with edaphic conditions which are seasonally waterlogged conditions. They are found in areas around Pesi river, Mutara ADC, Kifuko, Muruku, Thome, East Ewaso Narok, Maundu ni meri and Narok ranch. Also found in West Rimuruti town. It is not an important specie for browse. *Opuntia ecultata* is another species of the bushland ecosystem and it is a multi-stemmed bush with short, stout, sharp spikes and is utterly impenetrable because of the vicious spikes. It is used for fencing to control wild animals such as shown in Plate 6-1. They are mostly dominant in Mukogodo Division and the lower valley of Ewaso Narok and Ewaso Ng'iro Rivers. It is a prime forage for the honey bee.
3. Grasslands: This ecological resource is limited in Laikipia district. They are found in Solio ranch, Gianni estate, the Marmer CMD Holding lying between Sukuta Marmer and Kirimun.
4. Wetland Vegetation: Occurs in rivers traversing the Laikipia plains from the Aberdares and Mt. Kenya such as Tigithi, Burguet, Suguroi, Mutara, Pesi, Ewaso Narok. They are dominated by reed (murura). Swamps are home to some wildlife species but they are currently being developed for agricultural activities especially for irrigation and horticulture. The major irrigation systems are in these swamps particularly in Ewaso Narok Swamp at Rumuruti, and in the Pesi, Kiamariga, Ngobit (Mutara), Lamuria, Matanya and Sweet waters Swamp.

The forests in Laikipia district are facing pressure through harvesting for timber and also political pressure leading to encroachment of agricultural activities, hence the development of crop farming in changing natural vegetation. Figure 6-4 of land use and land ownership also shows the status of forest reserves in the district. Overgrazing and degradation has led to severe gully erosion and such

areas as Mukogodo-thus the Maasai pastoralists find limited room for traditional migration. The wetland have not been spared either and they are increasingly being drained for agricultural development.

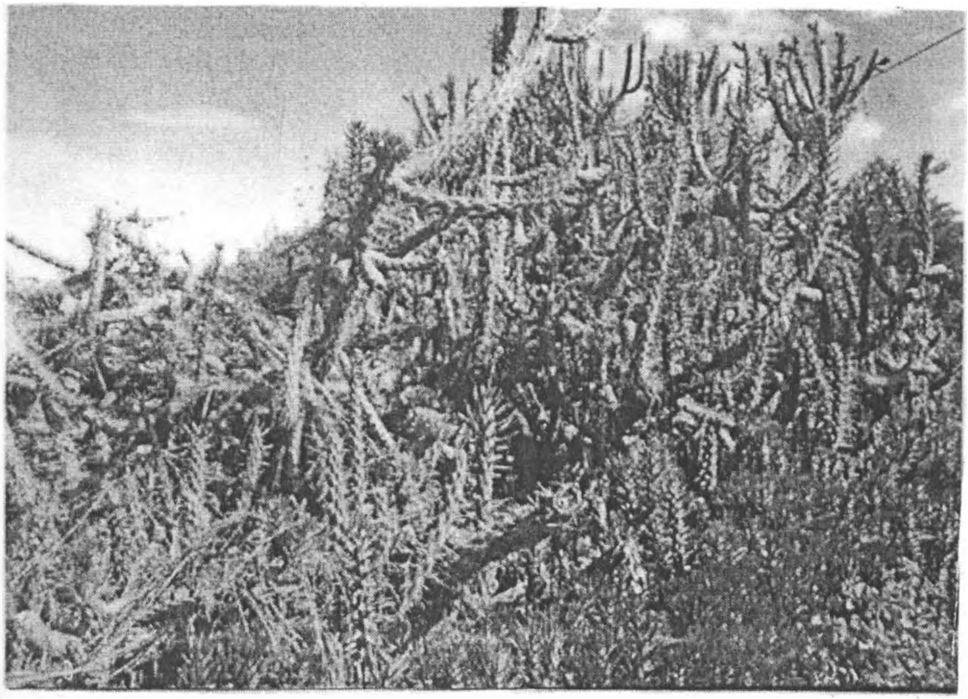


Plate 6-1: *Opuntia ecultata* bush fence

At the periphery of agricultural landscape clearing of wood vegetation for timber, charcoal firewood in the course of resent settlement has resulted in the vegetation transforming into open grasslands. These trends are increasingly threatening the survival of both man and wildlife.

6.2 Administrative and Political Background

Laikipia district is divided into five administrative divisions; Central, Mukogodo, Rumuruti, Ng'arua and Lamuria Division. The district is further divided into 21 Locations and 44 Sub-Locations (Figure 6-3). There are three Local Authorities in the District namely; Nanyuki and Nyahururu municipality and Laikipia County Council. The district is represented in parliament by two members of legislatures representing Laikipia East Constituency (covering Mukogodo, Central and Lamuria Divisions) and Laikipia West constituency (comprising of Rumuruti and Ng'arua divisions).

6.3 Historical Background of Land Use Activity

The original land use system reflects agricultural potential very well. In the pre-colonial period, Maasai occupied the territory as pastoralists, for whom the area is very suitable. At the end of the 19th century most Maasais were virtually eliminated from Laikipia by of epidemics of rinderpest and smallpox. The almost deserted area made it easy for colonialists to occupy the area. By treaties in 1904 and 1911, a northern Maasai reserve was created and the rest was made Crownland. The alienation of the white highlands in 1934 also included Laikipia in this category crownland.

The main agricultural activities of the European farmers were ranching and mixed farming in the wetter parts of Laikipia. Their products were transported by means of the railway and sold on the national market or exported. After independence the national policy of agriculture reforms and the land transfer programme also asserted its influence in Laikipia. Some European farmers sold their farms to the government, individual African farmers and private companies. However, the majority of the European farmers especially those with large-scale ranches remained in the area. The government purchased land to establish settlement schemes in the wetter parts on the former mixed farms, or to manage the land on large-scale basis. Some of the wealthier African farmers were able to purchase farms as individuals or in the form of partnership and started to run the enterprise commercially.

Private companies made up of many share holders also purchased farms and tried to run them as commercial enterprise, but most of them experienced management problems and decided to subdivide the land among the shareholders. Figure 6-4 shows the spatial dimension of the present land use and land ownership in the district. The process of subdivision and fencing often limits the wild animals into a small area with increased density. Despite the problems posed many ranches wouldn't mind the presence of wild animals; while others have wildlife reserves where tourists come to view them. The wild animals often breaks the fences to small scale farms which surrounds these ranches.

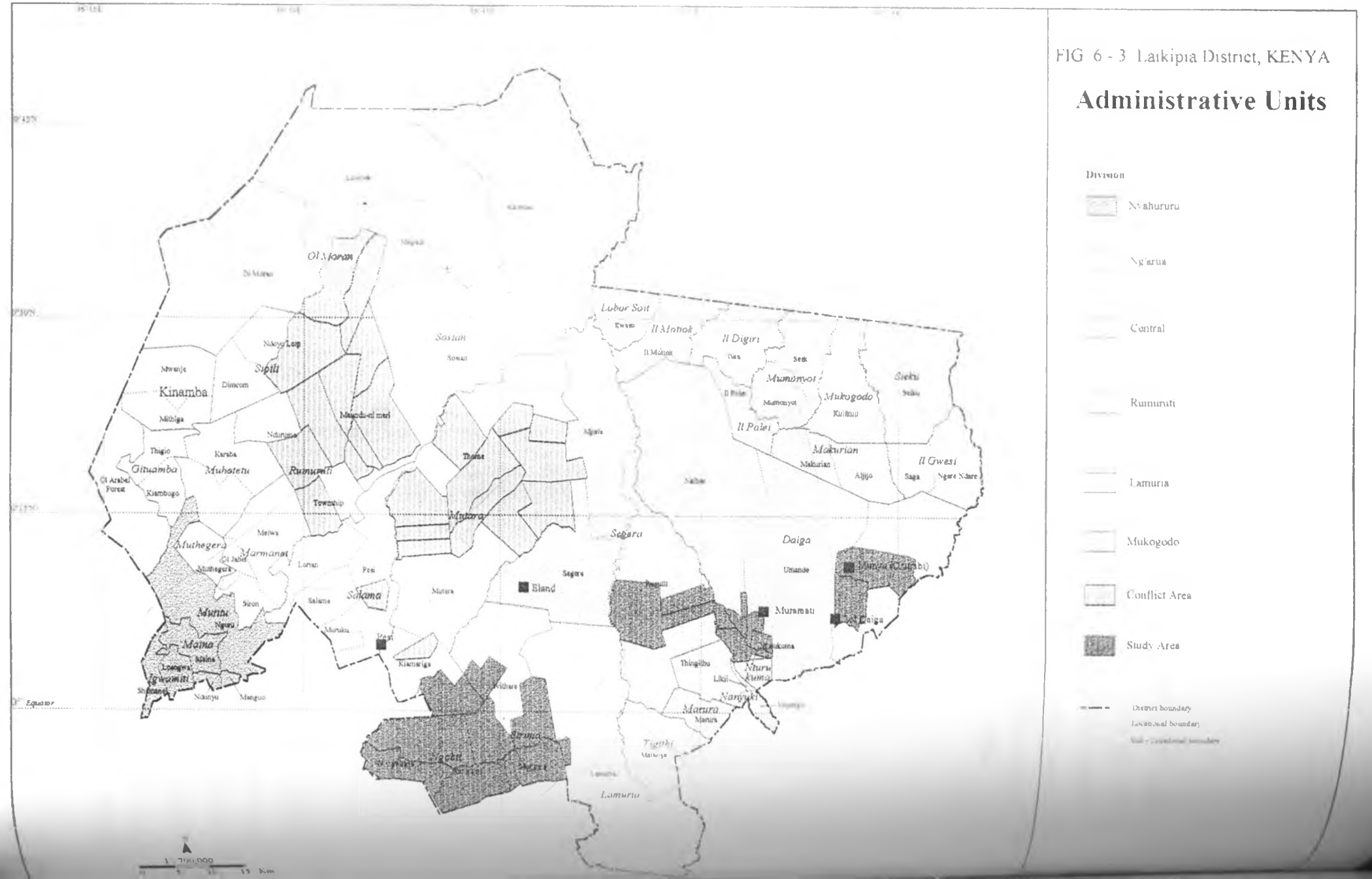
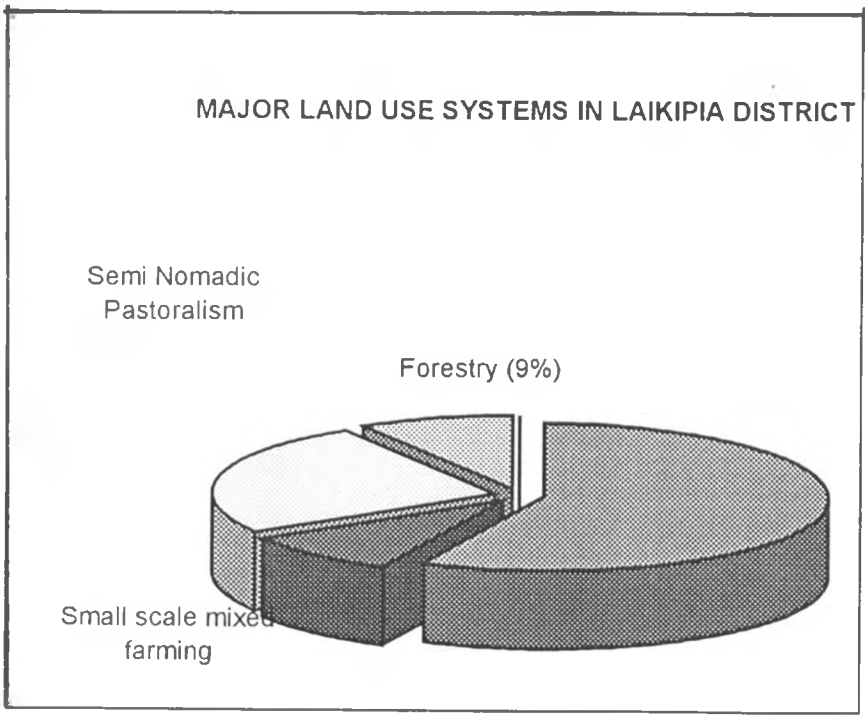


FIG 6 - 3 Laikipia District, KENYA
Administrative Units
Division
Nyahururu
Ng'arua
Central
Rumuruti
Lamuria
Mukogodo
Conflict Area
Study Area
District boundary
Ol Moran
Sosian
Lubor Soit
Il Motiok
Il Digiri
Mumonyot
Mukogodo
Sieku
Il Polei
Makurian
Il Gwesi
Ngare Ndare
Ajijo
Saga
Kinamba
Sipili
Ndonyo Lop
Dimcom
Mithiga
Ndunyio
Magadi-wa-meri
Thingio
Karaba
Gituamba
Muhotetu
Rumuruti
Township
Thome
Matura
Segera
Daiga
Kiambogo
Mutheger
Marmanet
Lorian
Salama
Mutara
Eland
Muramati
Muruku
Kiamariga
Thingithu
Likii
Nanyuki
Timau
Lamuria
Equator

6.3.1 Small Scale Farmers

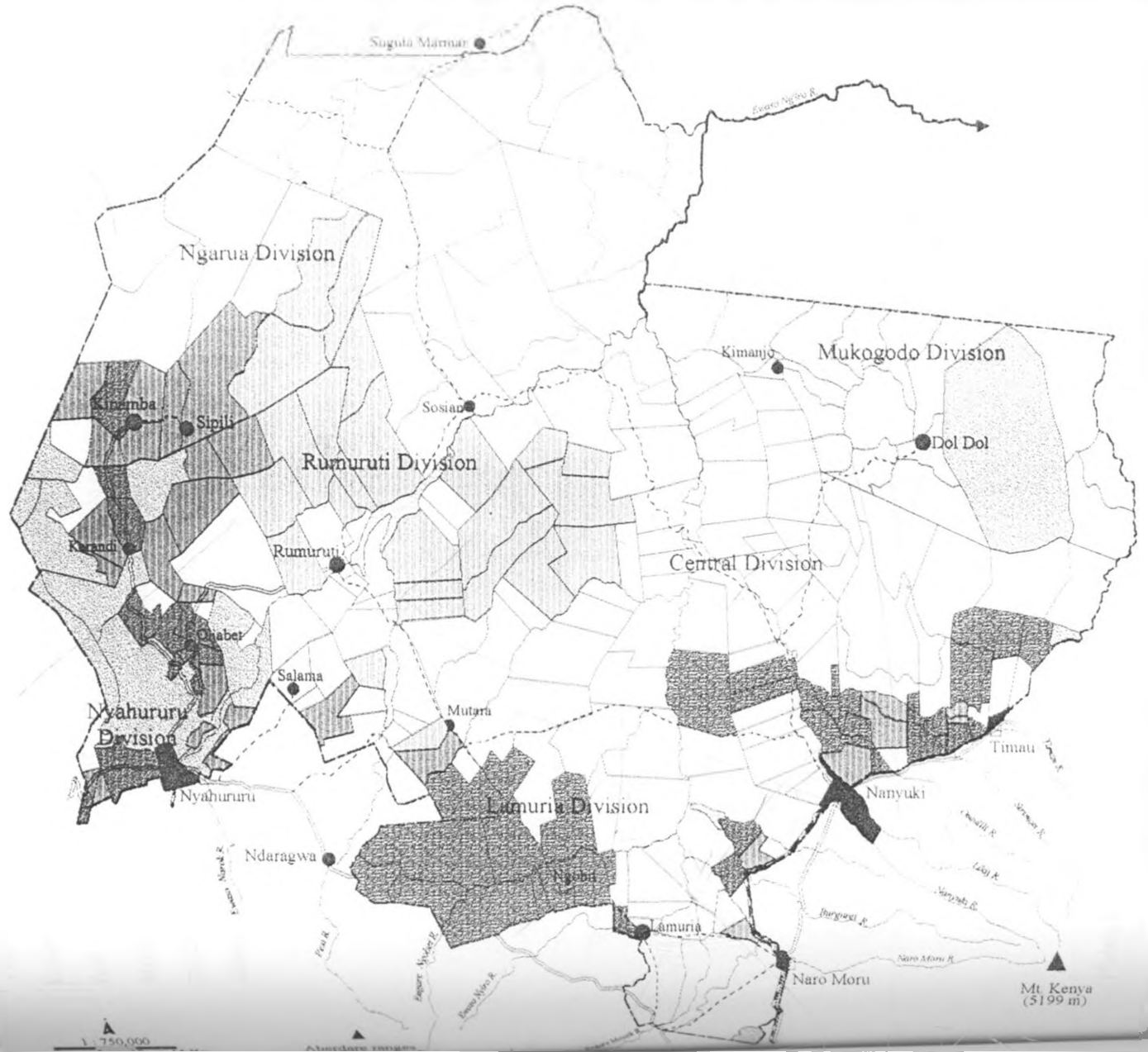
The aim of the peasant household is to provide for subsistence needs. Mixed farming is the most suitable; crops for human food consumption, daily cattle for milk supply and smaller livestock for meat supply. In Laikipia, only a small part of the district is suitable for rainfed crop cultivation. The study areas fall outside these areas. According to Thouless (1992), it consists of only 5.4 percent of Laikipia the total surface area.



The rest are rangelands which are appropriate for keeping livestock. This have been the tradition but current trends of land subdivision have seen cultivation being tried by new settlers. Cultivation as a land use system cannot co-exist in harmony with wildlife. Increased influx of small-scale farmers and the subsequent expansion of area under cultivation have increased the frequency of conflicts with wildlife.

FIG. 6 - 4

Laikipia District, Kenya



Dominant Land Use and Population Density

- Urban areas
- Small-scale farm areas > 150 persons/km²
- Small-scale farm areas 75 - 150 persons/km²
- Small-scale farm areas 25 - 75 persons/km²
- Small-scale farm areas < 25 persons/km²
- Pastoralist area
- Large-scale ranching
- Forest areas
- Swamps
- Conflict Area
- Study Area
- District boundary
- Planning unit boundary
- Railway line
- Tarmac road
- All weather road
- River
- Major Centres

6.3.2 Commercial ranches

The largest area consisting of 57 percent of Laikipia is occupied ranches where the activities are mainly geared for commercial production (Taiti, 1996). In some of the ranches, wild animals are not tolerated while in others they ranches have provided home to numerous species of wild animals. Wild animals are often attracted to the water and saltlicks that have been placed on the ranches for livestock as is the case in Plate 6-2. Often *Opuntia ecultata* (Plates 6-3) is planted along the fence.

Plates 6-2: Wild animals attracted to a water and saltlick that have been placed in one of the ranches for livestock

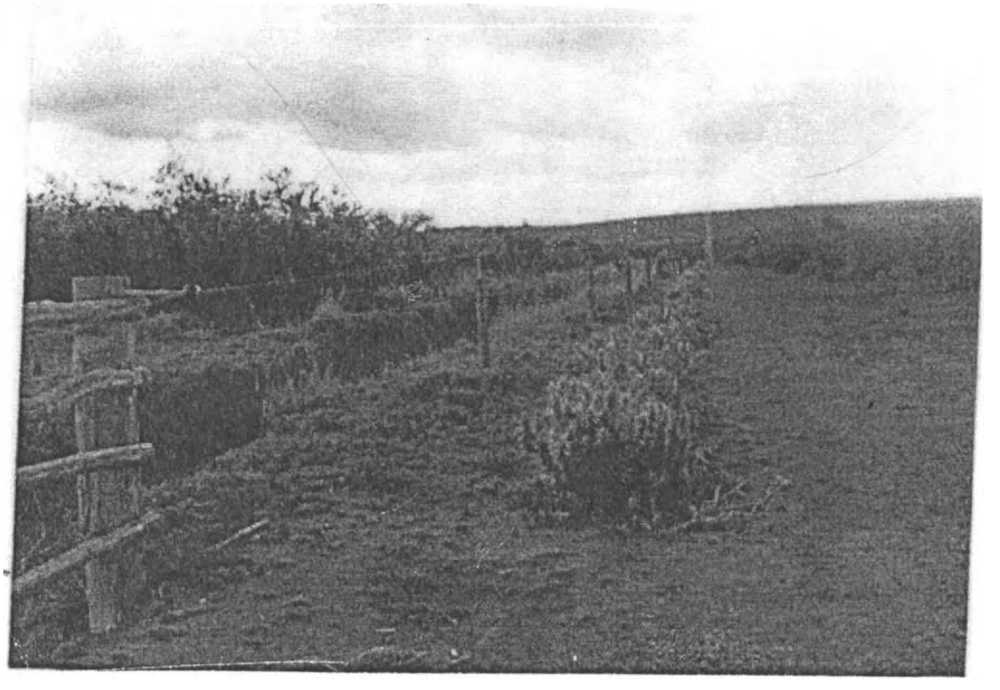


Plate 6-3: An electric fence round a Ranch with a combination of *Opuntia ecultata*

6.4 Demographic Factors

The population census of 1969 put the population of Laikipia District at 65,506 and in 1979 the population grew to 134,524 indicating a 102 percent increase in ten years. The district intercensal growth rate is 7.3 per cent per annum. Annual increase fell to 4.45 per cent, however this is still high when compared to he national average of 3.35 per cent. The projected population for Laikipia district for the 1994/96 planning period was 265,245 and 286,531 respectively. Table 6-2 shows the Population projection by division. The table indicates that Rumuruti Division had the highest population with a population of 103,151 persons. while Mukogodo had the least with a population of 22,923.

Table 6-2 Population Projection by Division

DIVISION	1979	1993	1994	1996
Rimuruti	48,279	91,324	95,487	103,151
Ng'arua	34,868	65,956	68,964	74,486
Central/Lamuria	39,792	20,294	21,220	85,959
Mukogodo				22,923
Total	134,524	253,678	265,245	286,531

Source: Laikipia District Development Plan, 1994/96

Plate 6-3: An electric fence round a Ranch with a combination of *Opuntia ecultata*

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Source: Laikipia District Development Plan, 1994/96

In terms of population density, Ng'arua Division had the highest population density. The division has high agricultural potential due to its rich fertile soils and favourable climatic conditions for agriculture. Land has consequently been sub-divided into smaller plots for the new settlers. Central Division population figures were combined with the Lamuria Division figures. Lamuria division is less densely populated which lowed the Central Division's density.

Table 6-3: Population Density by Division (Persons per KM^2)

DIVISION	AREA(KM^2)	1979	1993	1994	1995
Rumuruti	3498	13.8	26.1	27.3	29.5
Nga'arua	1070	32.6	61.6	64.5	65.6
Central & Lamuria	3989	10.0	19.1	19.9	21.5
Mukogodo	1166	9.9	17.4	18.2	19.7

Source: Laikipia Development Plan 1994/1996

Mukogodo had the lowest population density which can be explained by its unfavourable conditions for economic activities.

6.5 Wildlife Resources

While wild animals have decreased in other parts of the country where the animals are mainly found outside the protected areas, in Laikipia District, the numbers have increased. The two thousand (2,000) elephant population in Laikipia is one of the largest, population outside protected area. The elephants are free to undertake their usual seasonal migration that takes them more than 100 kilometers to the north into the Samburu rangelands during the rainy season. Laikipia District also provides the much needed refuge habitat for the endangered black rhino. There are five Rhino Sanctuaries found in Solio, Borana, Ol Jogi, Ol Pajeta and Lewa Downs. ranches. Solio Ranch in particular has for long, provided breeding ground for the rhino and the other ranches and parks have got new rhino animals bred from the ranch (Table 6-4).

Table 6-4: Number, Sex and Destinations of Rhinos translocated from Solio Ranch, 1993 and 1994

YEAR	NUMBER	FEMALES	MALES	PLACE
1993	8	4	4	Ol Pajeta
1994	4	2	2	Lewa Downs
1994	82	4	4	Tsavo East
1994	2	1	1	Aberdares
1994	8	1	4	Tsavo East
1994	1	4	1	Lewa

Laikipia plateau is also famous for the endangered Gravy Zebra. This animal has been relocated from the northern Kenya and Somalia. At present about 25 per cent of the world population of this species is found in Laikipia. There is large populations of other animal species such as, Buchellis Zebra, Oryx, Buffalo, Giraffe, Eland. Predators include the Lion, Hyena, Leopard, Cheetah and wild dog (Figure 6-5). Table 6-6 shows the total number of wildlife from an aerial count in February 1997.

Table 6-6 Result of a Sample of Wildlife Count in Laikipia District Feb.1997

SPECIES	TOTAL COUNT
Bushel's Zebra	35859
Impala	8436
Grant's Gazelle	6997
Thomson's Gazelle	5150
Eland	3667
Buffalo	2655
Elephant	1847
Hartebeest	2137
giraffe	1856
Onyx	1385
Waterbuck	621
Gravy's Zebra	870
Gerenuk	319
Total Wildlife	72618

Source: LWF Aerial counts, Feb. 1997

6.5.1 Distribution of Wildlife Species in Laikipia District

Zebras are the most abundant wild herbivore species in Laikipia and most widely distributed. Zebras are known to live in most habitat types found in Laikipia with open grasslands being the most favoured areas. The animals are therefore mostly found in the north especially in Marmar. In the drier areas receiving with less than 500 mm mean annual rainfall the zebra population is lower. The population is also lower in habitats dominated by *opuntia ecultata* bushland, and in the vegetation types associated with the shallow soils and scraps along the Ewaso Narok.

Impala are on the other hand mainly inhabit dispersed in woodlands but the animals are rarely found in the open grasslands. The impala tend to avoid the dwarf *acacia drepanolobium* and *pennisetum mezianum* which grow on black cotton soils. While the animals are found in few numbers in areas like the northern Segera, large numbers are found in riverine habitats and in other wetter parts of Laikipia. On the other hand Grant Gazelle are common and widely distributed throughout the open grasslands of Laikipia. As the animals are not entirely dependent on water

like other antelopes the gazelles are the most common species in the dry pastoral areas. Thomson Gazelle are also abundant but prefer open grasslands in the wetter parts of Southern, West and Central Laikipia. Elands prefer savannahs interspersed with scrubs vegetation. Buffalo prefer more diverse habitats, especially thicker bushlands and woodlands. However the animals have a dislike of open grasslands.

Elephants also prefer diverse habitats especially riverine thickets, but they are absent in the open grasslands. The Elephants migrate long distances on annual basis from central Laikipia to Samburu District and even further. Climatic factors, especially rainfall factor dictates the migratory patterns and movement of the elephants (Figure 6-5). During rainy season Elephants moves from the forest areas where food availability conditions are much unfavourable. In their migration the animals enter Laikipia district from Mukogodo into Rumuruti forests in November and December. They move on to Oldaiga, Ol Jogi, Rumuruti; and finally into Mutara locality. By this time it is the breeding period of the elephants. During the months of January and March the animals migrate back to Borana and Ilingwesi ranches and move to Ol Pajeta and Ol Jogi ranches before they finally get to Samburu.

Hartebeests on the other hand widely dispersed in small groups but they occur in open habitats, even in small patches of grassland that are surrounded by bushy savannas. These animals are more abundant in the wetter south and west of Laikipia. Western part of the district has a favourable habitat for the giraffes but they are peculiarly absent. Most likely giraffes are sensitive to the presence of human habitation. Oryx are present in relatively low numbers but they are confined to the drier parts of the district. Gerenuk is a rare specie and is confined to the dry thorn scrub areas. The animals are mostly found inside the fenced sanctuary of Ol Jogi. Figure 6-5 shows the distribution of different wildlife found in Laikipia district.

The variety of wildlife species in Laikipia exhibit strongly contrasting distributions that is consistent with what is known about their different habitat an climatic preferences. These contrasting preferences compliment each other and also produce a seemingly continuous distribution of wildlife in the region as well as a beautiful wildlife scenery.

Despite the rich wildlife resources and its potential for tourism industry, the areas the animals occupy in Laikipia District are threatened by continued expansion of human settlements. One indication is that the Laikipia ecosystem currently functions in isolation from the Aberdares and Mt. Kenya ecosystems. Even within the district itself wildlife is non-existent where land use practices such farming and urbanisation are not consistent with animal habitats.

The areas that are now adversely affected by this phenomenon are Nyahururu, Nanyuki and Sipili townships, where towns have expanded, beside farming zones such as Lamuria. Areas that are not heavily settled, such as Mifugo, Mathira, Thome B, parts of Ethi and Laikipia East, Maundu-ni-meri and a section of Segera-Kariunga/Mutirithia. This indicates that there is a relationship between progressive settlement and reduction of wild animals were the human settlement to continue taking on more land and preventing the Elephant migratory routes. Elephants have a higher chance of continued existence, though in disturbed habitat since they still have access to the migratory routes to the north west. Other wild animals such as Gravy's Zebra, Giraffe, Oynx and Gerenuk however, face fundamental changes in their habitat to the extent of introducing permanent harsh habitat conditions for their survival.

6.6 Tourism Potential of Wildlife in Laikipia

Eco-tourism is a non-consumptive method of utilising wildlife. It offers least manipulation of resources and hence remains compatible with strict conservation. It involves visitors coming to view and enjoy resources such as wildlife, natural landscape, and sites of cultural interests.

It is interesting that unlike other parts of the country with equally abundant wildlife, Laikipia District do not attract as many tourist per year, as would be expected. Tourists who visit touristic areas in Laikipia patronise extremely expensive and high class touristic facilities that are primarily confined in ranches such as, Borana, Sweetwaters, Colchechio, Ol Niyiro and Solio. Maasai in Laikipia through group ranches have been able to put touristic facilities through contracts with private developers such as Il'Ngwesi Lodge, Pasama Rua tented camp, El karama, Kifuko, Mugwooni Bandas and Ol Nyari Mukutan Retreat. Visitors are able to enjoy the beautiful scenery and a variety of wildlife. The potential for tourism in the district is high and largely unexploited. Within the existing status the small-scale farmers cannot benefit directly from tourism.

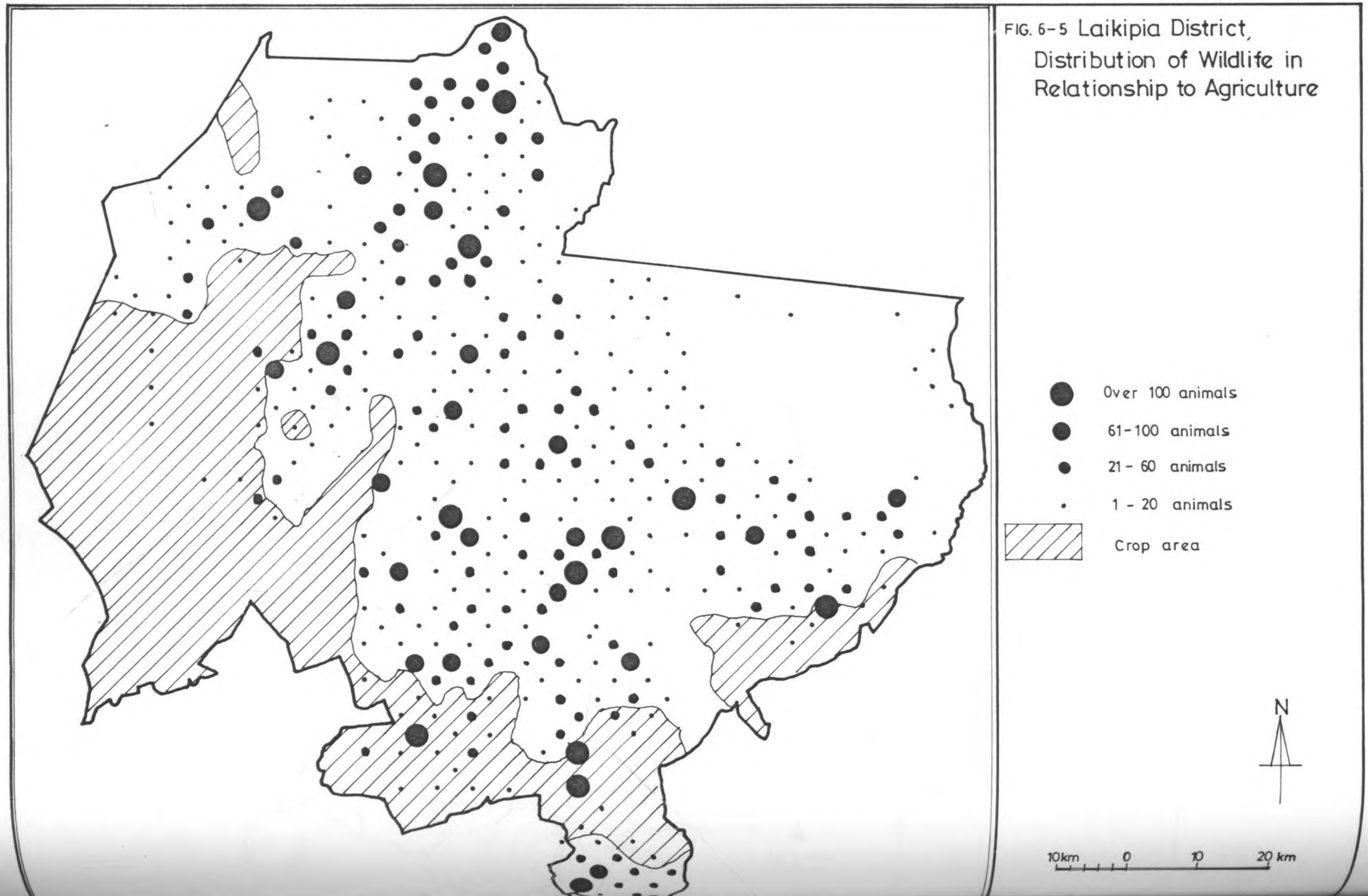


FIG. 6-5 Laikipia District,
Distribution of Wildlife in
Relationship to Agriculture
Over 100 animals
61-100 animals
21 - 60 animals
1 - 20 animals
Crop area
N
10km 0 10 20 km

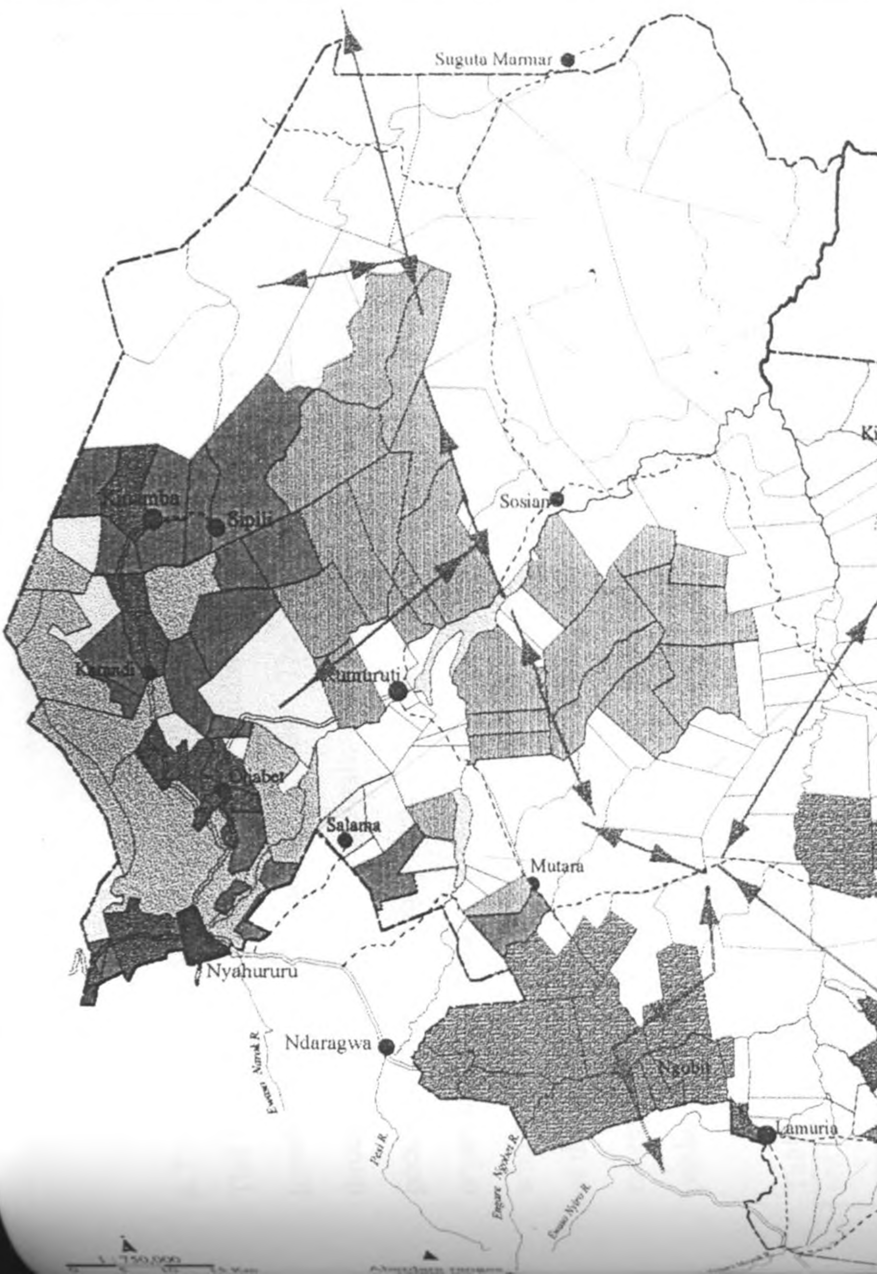
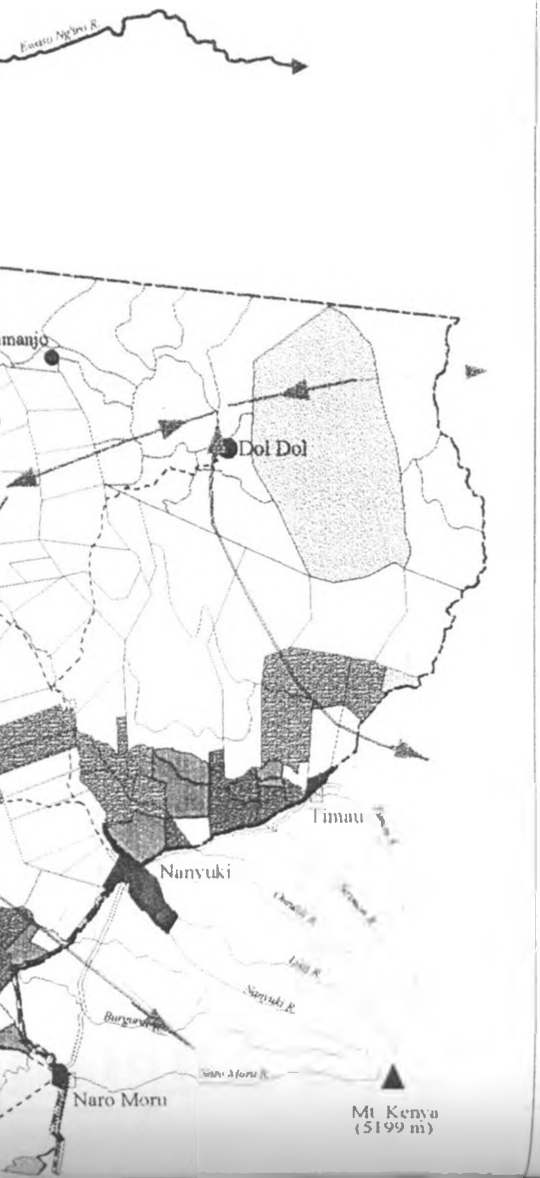

Suguta Marmar
Sosian
Sipili
Rumuruti
Salama
Mutara
Nyahururu
Ndaragwa
Ngobit
Lamuria
Pesi R.
Ewaso Nyiro R.

FIG. 6 - 6

Laikipia District, Kenya

Elephant Migratory Routes



- Urban areas
- Small-scale farm areas > 150 persons/km²
- Small-scale farm areas 75 - 150 persons/km²
- Small-scale farm areas 25 - 75 persons/km²
- Small-scale farm areas < 25 persons/km²
- Pastoralist area
- Large-scale ranching
- Forest areas
- Swamps
- Conflict Area
- Study Area
- Migratory Route
- District boundary
- Planning unit boundary
- River
- Major Centres

S: Laikipia Research Programme Database

6.7 Non-Touristic Attributes of Wildlife

This involves cropping of certain wildlife species such as zebra, Thomson gazelle, giraffe, hartebeest, buffalo, eland and impala. The wild animals are utilised in a sustainable manner through shooting of excess animals. The skins and meat are sold and the money that is accrued goes directly to the landowners. For the small-scale farmers they have to join into a wildlife organisation in order to qualify for any quota allocation and enter into a contract with a rancher who will crop for them. The revenue that is accrued is used to fund a project of their own. Some of the projects that have been funded in Laikipia district are presented in table 6-7. The projects ranges from profit making enterprises, technical assistance and equipment's, social projects and public mobilisation.

Table 6-7 Summary of Species Cropped in 1996 Quota

UNIT	QUOTA NO.	BUFFALO	ELAND	IMPALA	GRANTS	TOMMY	W. BUCK	WART HOG	ZEBRA
Eastern	130	5	4	16	6	2	0	24	406
USA Near	238	5	0	16	13	0	0	0	204
Central S./W.	286	1 0	4 0	14 0	39 0	0 0	82 0	0 0	446 79

Source: Ndung'u and Kaaria, 1997

Table 6-8 Projects funded Through Wildlife Development Fund From 1992 to 1997

CATEGORY	PROJECT/ACTIVITY	CURRENT STATUS	YEAR OF FUNDING	AMOUNT SHS.
Enterprise	Illingwesi Banda	In use	1995	4,000,000
	Doldol Bee Kept	In use	195	100,000
	Bokish Bee Kept	In use	1995	110,000
	Mukodo Center	Complete	1995	500,000
	Malone Bee	In use	1996	205,000
Total				5,030,000
Social	Water Projects			
Projects	Kijabe bore hole	Uncomplete/in use	1995	300,000
	Matanya Disp	UnComplete/in use	1992	198,000
	Oloiborsot/Clinic/dispConstn.	Drugs bought	1996	429,425
			1996	532,249
	Illingwesi road	Grading(20km)	1996	250,000
Total				1,709,674
Technical	Project prep cost	projetct prepared	1995	426,000
Assist. and	Legal/G. ranch	Services provided	1995	100,000
Equip.	Scouts Biyccles		1995	250,000
Total				604,691

Mobilization	PRA Mukogodo	CAP drwn	1995	65,531
	PRATigithi/Sirim	CAP Drawm	1995	190,302
	Control Training	Rangers trained	1995	182,300
	Workshop	30 persons workshop	1995	328,000
	Focal Meetings	Meetings held	1995	94,000
	Scout training	26 trained	1995	124,302
	Educ tour	17 moians	1995	
	Adm. Skills	20 men trained	1995	350,000
	G. ranch course		1995	
Total				1,006,935
Total Funding				**10,096,235**

Source; Ndung,u and Kaaria, 1997

6.8 Case Study Areas

The purpose of this section is to introduce the specific areas that the study was carried out at the same time show peculiar attributes of these study sites.

6.8.1 Ngobit/Sirima Conflict Zone

This conflict zone consists of sections in of Sirima and Ngobit locations. The locations are situated in the Eastern part of the district and surrounded almost wholly by Ol Pajeta ranch. Other ranches neighbouring these locations includes Tharua Farm, ADC mutara and Suguroi Ranch. These ranches almost practice almost exclusively ranching. The area is generally flat and dissected by two rivers Ewaso Ng'iro and Ngobit rivers in addition to several dry beds. The total annual rainfall is about 757 mm with a mean monthly rainfall of about 63 mm.

Ol Pajeta Ranch is an important wildlife habitat for several large and small mammals including primates and birds. Elephant numbers vary according to seasons but the ranch have a resident population of 80 elephants. Other large mammals include Buffalo , Eland, Bushbuck, and Onyx Predators include jackal, cheetah, lion and hyena. Sweet Waters game Sanctuary also owned by Ol Pajeta is completely enclosed with a standard elephant fence and tourism is an important land use activity. Wildlife in the other ranches is not tolerated.

Farmers in this region practice mixed farming of crop cultivation and livestock keeping. Maize, beans and potatoes are inter-cropped by the farmers in the hope that when maize is raided by the elephants and other wild animals, beans and potatoes will survive, thus reducing the output. However, this has never been the case as the beans and potatoes do not survive the trampling by the elephants, while they are also destroyed by other smaller mammals.

The area along rivers Ngobit and Mutaro has become important horticultural crop producing areas, with an irrigation scheme in Mutaro (New Mutaro irrigation Scheme) funded through the Ministry of agriculture by the European Union. A wide variety of crops are grown such as tomatoes, onions, cabbages and kale. The river valleys are also important wildlife migratory corridors with Ngobit River valley having salt licks traditionally used by elephants and other wildlife species like buffalo.

6.8.2 Ethi/Laikipia East Conflict Zone

This area is located in the North Eastern part of the district. The zone is surrounded by Lol Daiga, Kamwaki and Borana ranches. The area is generally rugged with many dry beds which have water only during the wet season. Rainfall is between 500-600 mm annually. It falls under the agro-ecological zone VI, classified as ranching zone. The major economic activities in the region include livestock and crop farming. Although the area is not suitable for maize, it is grown together with beans and potatoes, but since the plots are larger wheat is grown. Pastoralism mode of livestock production dominate. Cattle rustling discourage settled communities from livestock keeping therefore, the farmers mostly engage in cultivation of crop.

Borana ranch is an important wildlife habitat with both large and small mammals. The ranch is completely fenced with a standard electric fence which is linked to Engare Ndare forest as an ecosystem. Tourism is an important economic land use in the ranch credit to the beautiful landscapes and wild animals. In the other ranches like Kamwaki which is not fenced wildlife is not tolerated. Some of the wildlife species found include the endangered Grevy's Zebra and Elephants among others. The area is scarcely populated with a density of 25 persons per Km^2.

6.8.3 Kariunga/Mutirithia Conflict Area

This area is located approximately 20 km North of Nanyuki, near Naibor trading centre. Mutirithia/Kariunga receives rainfall twice a year - March-May for the long rains and October - November for the short rains. The mean annual rainfall for Mutirithia/Kariunga is 655 mm. The scattered rainfall pattern however reduces the effectiveness of the rainfall for plant growth. Timau river and Nanyuki rivers pass through or border Mutirithia/Kariunga. Given the high level of illegal water abstractions in the district, the river water resources are already over exploited.

In this data collection area, the major economic activity is crop farming and livestock keeping. Livestock keeping is discouraged by cattle rustling while crop production is determined by the amount of rainfall. Due to inadequate rainfall farmers always run the risk of crop failure. In 50 per cent of the growing seasons the farmers run the risk of crop failure. This is further compounded by the fact that even in good years, like in 1994, wildlife could destroy quite a large part of the harvest, leaving crop farmers with no other option than to engage in charcoal burning to make minimal livelihood.

The soils are medium to heavy texture, imperfectly drained, black to very brown. On the steep slopes the soils are shallower, tending towards rendicinas in character, but variable owing to the varying nature of the state on which they lie. The dominant types of vegetation used on aerial photographs and observations on the ground are, riverline forests, leafy lowland bush and thicket, *acacia* and *drepanolobium* bush land and grasslands (Huber and Opondo, 1995).

History of settlement in Mutirithia/Kariunga dates back after independence when the Europeans settlers withdrew from the ranches in Laikipia. Most of the ranches were sold to private individuals, while others were bought by land buying companies. Some ranches continued as large-scale enterprises, others were sub-divided into 100 or 1000 small farms of the small scale farming area of about 20 percent involved government settlement schemes and 80 per cent settlement by private land buying companies. It is under this private category that fall Mutirithia/Kariunga. The region is neighboured by such ranches as the Ol Pajeta and Mpala which harbours substantial number of wild animals.

Mutirithia was purchased by Rugutu Mutirithia Farm-Buying Society which was formed in 1964, Mutirithia was bought in 1968 by 400 members. The Kariunga Company Limited was formed in 1968; the farm was bought in 1972. Mutirithia was managed as a company until 1979, but as a large scale ranch it did not make profit, Kariunga was managed as a co-operative company up to 1982, apparently with some profit. Mutirithia was divided into 10-acre plots in 1982 among 420 members; tittle deeds were issued in 1988. Kariunga was subdivided into 300 plots in 1984, no tittle deeds has been issued up to 1990. Interestingly, only 10 percent to 15 percent of the area has been settled to date this slow settlement process

can be explained by the presence of many wild animals such as Monkeys, Elephants and Buffaloes among others. Many farmers are therefore abandoning their plots due to drought and more so the manifestation of wildlife hence most of the land has reverted to communal use favouring wildlife land use (Huber and Opondo, 1995).

The settlers in the Kariunga/Mutirithia area, are Kikuyu people from Nyeri District. Those in Kariunga are mainly tea farmers Mathira Division and Tetu Division while those in Mutirithia are mainly Mukurweini Division.

6.9 Summary

Land use in Laikipia district like all other transitional settlement areas is influenced by physical and climatic factors such as soils and rainfall among others. The land use activities in the district had remained natural with minimal changes until the influx of population after independence. High population increases in the district is exerting a lot of pressure on the natural environment and therefore habitat for wildlife. The district is mainly dominated by large-scale faring with a majority of the population practising small scale farming as the main economic base.

The topography, rainfall patterns and the soils of the district influence vegetation cover and distribution of both wildlife and human populations. Areas with high rainfall and sufficient moisture have attracted the high human populations due to their suitability for settlement and agricultural practices to an extent that they are longer wildlife habitats. The new settlers also favours river valleys for its lucrative horticultural farming through irrigation. These areas also doubles as wildlife migratory corridors and breeding grounds. The wave of immigration has seen some areas being settled and colonised by small scale farming communities who have curtailed any habitation by wildlife. In some other areas where sub division of land is more recent, occupation of the plots is still an on going concern and wildlife and the few settlers who are there compete for the use of the same land resource. The land pressures have constrained wild animals in the large-scale ranches and since most of these small scale farms are surrounded by the ranches, it is possible for the wild animals can raid the farms from a safe distance. This is more likely in cases where the animals involved are big mammals such as the elephants and where the barriers are not electric.

Despite the rich endowment in wildlife resources, the district does not receive as many tourists as would be expected. The few visitors patronise the expensive private reserves in the large-scale ranches. Non-touristic activities involve cropping certain wildlife species such as Zebra and Gazelles among others. Benefits accrued go directly to the land-owners concerned to support community projects.

CHAPTER SEVEN

CONTEXT FOR HUMAN-WILDLIFE CONFLICT IN LAIKIPIA DISTRICT DATA ANALYSIS AND RESULTS

7.0 Introduction

This chapter aims at presenting the primary data gathered from the field through the use of questionnaires photography and observation. The analysed results will be presented as outlined earlier in the chapter 2 through the methods earlier discussed in chapter two..

7.1 Social Economic Background of Small-holder Farmers

68.4 percent of all respondents were males while to 31.6 per cent males and females. The high percentage of male compared to that of female is due to the domination of men in economic activities in Laikipia. This can also be explained by the fact that during the reearsch was carried out during at the onset of migratory wild animals. Thus men were more accessible since they were mostly in their plots guarding against any marauding wild animal. Interestingly, for the male respondents, majority were aged 18-30. None of the respondents was below 18 years. It is important to note that most of the respondents were heads of young families who rely on subsistence faring for their livelihood. Again respondents are migrants, with 67.2 percent from Nyeri district. Only 14 per cent of the respondents have Laikipia as their home district. Other districts of origin included Bungoma, Meru, Nairobi, Nyandarua, and Nakuru. In terms of provinces, most of the respondents had Central Province as their origin.

Most interesting, the types of crops grown by the new immigrants such as maize, beans, potatoes are the staple foods in Central Province which is their place of origin. The new settlers keep contact with their relatives in district of origin with the highest percentage making an average of one a year trip to their districts of origin. Those who keep contact with their relatives accounted for 34.2 percent. Other visits were made thrice an year 10.1 percent, quarterly 3.8 percent, twice an year 12.6 per cent, monthly 19 percent, weekly 6.3 percent and others occasionally 6.3 percent . Reasons advanced for the visits to districts of origin varies from one individual to another. Most people, accounting 46.8 percent went to visit friends and relatives. Other explanations for the visits included to attend ceremonies, business purposes and in search of food, accounting for 3,6 percent

and 5.1 percent respectively. Despite their contacts with their districts of origin the highest percentage of 94.5 percent had taken up Laikipia District as their permanent home.

Asked why they perceive life as permanent in the district, majority explained as having no land elsewhere. Land pressure in Central Province is the major reason for their permanency in Laikipia. Besides, availability of land in Laikipia has acted as a pull factor.

The plots are too small for the ecological setting of the region. Table 7-1 shows the average farm sizes of the respondents in the three data collection areas. The table indicates that the most common range of plot sizes is less than six acres which ranked highest in all the three data collection areas. In Ngobit/Sirima land sizes are more evenly distributed 6-20 acres range, as compared to Kariunga/Mutirithia and Ethi/Laikipia East. In Ethi/Laikipia East there is a high percentage of farmers owning pieces of land of between 11-20 acres as compared to Kariunga/Mutirithia and Ngobit/Sirima which can be explained by the fact that plot sizes in Ethi/Laikipia East mostly were subdivided into plots of 19 acres and most of them are still unoccupied. However, very few farmers owned plots in the category of 21-50 plot which was highest in Kariunga/Mutirithia (12 per cent) followed by Ngobit/Sirima with 5.6 percent and none in Ethi/Laikipia East in this category.

For the over all plot sizes the highest percentage 46.8 percent owned plots sizes of 6-10 acres, 11-20 acres and 21-50 acres accounted for 22.8 percent, 7.6 percent and 22.8 percent respectively. The plots have been acquired through purchase, inheritance or rental. Those who acquired the plots through purchase accounted for 73.4 per cent, 22.8 per cent through inheritance and Rental accounted for 3.8 per cent.

Table 7-1 Plot Sizes in Kariunga/Mutirithia, Ngobit/Sirima and Ethi/Laikipia East

PLOT SIZES (Acres)	KARIUNGA/ MUTIRITHIA	NGOBIT/SIRIMA	ETHI/LAIKIPI A EAST
Less than 6	55.1	38.9	58.3
7-10	19.1	33.3	0
11-20	15.2	22.2	541.7
21-50	12.2	5.6	0

A high percentage of the smallscale farmers practice mixed farming involving rearing of livestock and cultivation of crops. Cattle, sheep goats are the most widely kept livestock, Donkeys are also

kept for transport of goods. A high proportion of the farmers accounting 89.9 percent keep livestock while 10.1 percent are not livestock owners. Theft of livestock which at times involves violence is widespread in Laikipia District including the study areas. Cattle is the type of livestock most preferred cattle rustlers. Output from the farms is barely enough to sustain most of the households. Only 46.8 percent of the respondents get enough farm produce to sustain their families. The other 53.2 percent are not able to produce enough from their family land.

Table 7-2 District of Origin For The Migrants

NYERI	LAIKIPIA	MURANG'A	OTHERS
67.1	14.1	5.1	13.8

7.2 Agricultural Productivity

Crop output is dependent on a the natural factors of climate (rainfall patterns), soils, and topography. Other factors include socio-cultural, economic and political institutional factors. In the Laikipia plateau, climatic (rainfall and temperature) factors are the most important factors influencing crop farming. Rainfall distribution and amount cannot sustain rain fed agriculture which majority of the immigrants practice. At the same time the presence of large numbers of wild animals have contributed to the drop in crop output because the animals destroy the crops.

When asked to rank the main important problems affecting farming residents cited shortage of rainfall as the major factor in all the three data collection areas. Table 7-3 presents the major farming problems that farmers ranked highest. Problems related to wildlife was the second in order of importance in Ngobit/Sirima and Kariunga Mutirithia with 38.8 percent response rate. Wild animal related problems was of less importance in Ethi/Laikipia East. This can be explained by the fact that the neighbouring Boran Ranch is completely fenced with a standard electric which prevents wild animals from getting out of the ranch. Cattle rustling is rampant in Kariunga/Mutirithia and Ethi/Laikipia East, which was cited by 16.7 percent of the respondents while it was less in Ngobit/Sirima. There are more pastoral communities in Kariunga/Mutirithia and Ethi/Laikipia East which explains why this problem exists. This factor discourages the sedentary communities from practising livestock farming and therefore resulting to the more unecological system of crop cultivation.

Table 7-3 Major Farming Problem in Ngobit/Sirima, Kariunga/Mutirithia and Ethi/Laikipia East

FARMING PROBLEM	NGOBIT/ SIRIMA	KARIUNGA/ MUTIRITHIA	ETHI/LAIKIPIA EAST
Climatic (Rainfall)	77.6	50	50
Wildlife	38.8	38.9	8.3
Lack of Capital	38.8	5.6	25
Poor Soils	10.2	5.6	0
Cattle Rustling	4.1	16.7	16.7

In the three study areas 51.9 percent of the respondents cited that climatic factors (rainfall) as the major factor influencing farming. Those who ranked wild animals in the first category accounted for 27.9 percent. The main problems that according to the farmers, affect farming are ranked in order of importance in the Table 7-4. Problems attributed to the wild animals ranked highest with 35.5 percent, followed by the problem of lack of adequate capital. Insecurity due to due to cattle rustling and ethnic warfare ranked third.

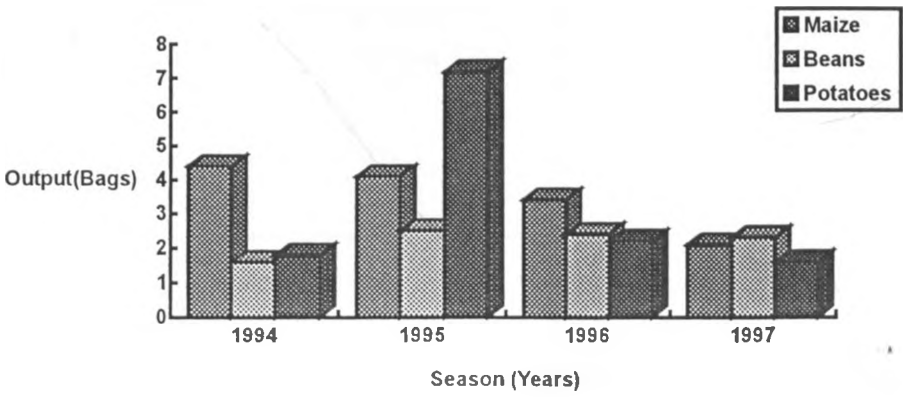
Table 7-4 Summary of the Major Farming Problems in order of Importance

FARMING PROBLEM	RANK			
	1	2	3	4
Climatic (Rainfall)	51.9	5.1	1.3	3.8
Wildlife	27.9	35.4	13.9	2.5
Capital	11.4	31.6	40.1	2.5
Soils	6.3	3.8	6.3	1.3
Cattle Rustling	1.3	7.6	2.51	

Rainfed agriculture is not compatible with the ecological setting of the ASAL. Most of the smallholder farmers rely on rainfall for producing their crops but are not able to produce enough. Figure 7-1 indicates the trend of production for maize, beans and potatoes for the last four years. The average maize production for the four years was 3.4 bags, 2.2 bags and 4.3 bags of beans and potatoes respectively. The trend shows that maize output fell drastically during the four years 1994-1997.

Maize production is supplemented with beans and potatoes. The performance was poor despite it's potential in the district. The poor performance of crops can largely be attributed to climatic factors. The contribution of wildlife to low productivity is difficult to quantity as is the climatic factors. Other crops grown include tomatoes, onions, and carrots along riverside plots and wheat which is the major cashcrop for those with large pieces of plots.

Figure 7-1 Average Crop Production in Laikipia District



7.3 Source of Human-Wild Animal Conflict

The survey established that all of the respondents have had at least a visual encounter with wild animals in their neighbourhood. Table 7-5 shows different species of wild animal that the respondents recorded having seen in their neighbourhood. The table indicates that 94.9 percent of the respondents have seen elephants in their neighbourhood. Other wild animals seen include cape hares, lions, leopards, waterbucks, mongoose, zebra, buffalo, warthog, gazelles and dick dick.

Asked whether there exists conflict between respondents and wild animals, 97.5 per cent indicated they have. Only 1.5 percent of the respondents have never had any conflict with wild animals. These conflicts have fuelled the bad blood between the small holder farmer and the wildlife.

7.4 Wild Animals Involved in Conflict

With regard to problematic wild animal respondents were asked to rank the most problematic species in order of importance. According to the rankings Elephants came first in terms of destruction in all the three conflict areas with a very high response rate of 93.9 percent, 88.9 percent and 83.9 percent in Ngobit/Sirima, Kariunga/Mutirithia, and Ethi/Laikipia East respectively.

Elephants were also ranked first with 92.5 per cent followed by monkeys (16.5 percent) in the second rank order. Thomson gazelles had the highest response rate (8.9 per cent) in the third rank order. Predators were represented by the Hyena in the second rank order with 2.5 percent response rate.

Table 7-5 Problematic Wildlife Species in Specific Conflict Areas

RESPONSE RATE				
RANK ORDERS	**ANIMAL SPECIE**	**NGOBIT / SIRIMA**	**MUTIRITHIA/ KARUINGA**	**ETHI / LAIKIPIA EAST**
I	Elephant	93.9%	88.9%	83.9%
	Monkey	2.4%	11.1%	-
	Thomson Gazelle	4.1%	-	-
	Swine	-	-	-
	Zebra	-	-	--
II	Leopard	-	5.6	8.3
	Monkey	10.2	28.8	8.3
	Swine	6.2	5.6	16.7
	Buffalo	10.2	-	-
	Antelopes	6.1	-	-
	Waterbucks	14.3	16.7	-
	Porcupine	-	5.6	8.3
	Elands	4.1	-	-
	Gazelles	8.2	4.1	-
	Elephants	4.1	5.6	
	Hyena	4.1	5.6	-
	Zebra	-	-	41.7
III	Porcupine	4.1	14.1	16.7
	Swine	2.04	5.6	-
	Thomson. Gazelle	6.1	5.6	-
	Water Bucks	2.04	-	25
	Zebra	-	5.6	-
	Buffalo	4.1	-	8.3
	Antelopes	-	-	-
	Monekys	2.04	5.6	-
	Elephants	-	-	-
	Guinea Fowl	-	5.6	-

Table 7-6 Summary of Problematic Wildlife Species

RANK ORDER	ANIMAL SPECIE	RATE OF RESPONSE
I	Elephant	92.4
	Monkey	2.5
	Swine	2.5
	Zebra	2.5
II	Monkey	16.5
	Buffalo	5.1
	Antelope	3.8
	Hyenas	2.5
	Thomson Gazelle	5.1
II	Thomson Gazelle	8.9
	Porcupine	6.3
	Zebra	5.1
	Guinea fowl	1.3
	Monkeys	2.5
	Waterbucks	1.3
	Swine	2.5
	Buffalo	2.5

This response gave a good indication of how respondents viewed the problematic wild animals. Ranking decreased where the destruction was low giving an indication of possible co-existence wildlife species.

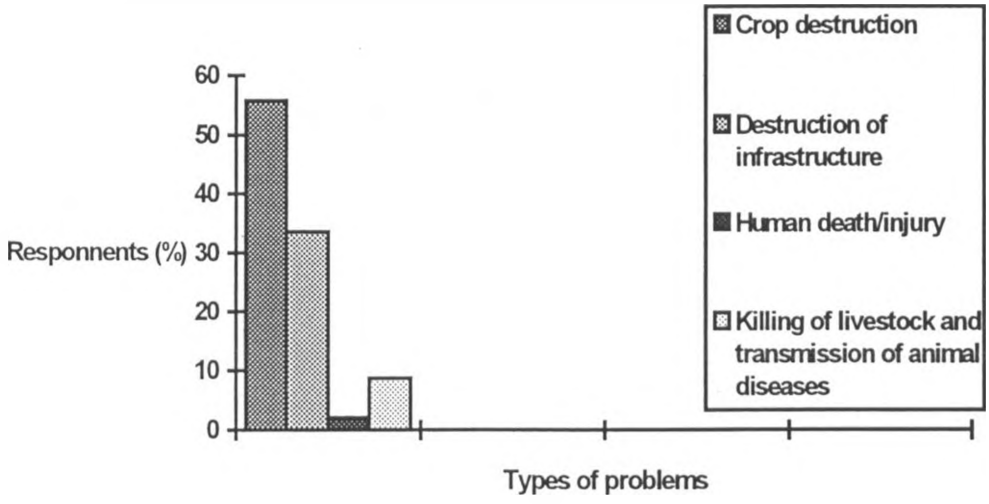
7.4.1 Problems Associated with Wildlife

To show the costs associated with wildlife respondents were asked to site problems experienced from wildlife and response coded into:

I. Crop destruction
II. Destruction of infrastructure and fences
III. Human injury and dealt
IV. Killing of livestock and transmission of animal diseases

Results showed crop destruction as the major problem with 55.7 percent followed by destruction of infrastructure like fences and stores. Killing of livestock and diseases transmission accounted for 33.6 percent and 8.6 percent respectively. Human injury and loss of life was least recorded with 2.1 percent.

Figure 7-2 Problems Experienced From Wild Animals



7.4.2 Wildlife Species Associated with Problems

From the field survey it was revealed that problems experienced from wildlife largely depended on the wildlife species and specific problem in question. To show how respondents view wild

animal species, each wild animal specie was compared against a particular problem and responses computed. The problems included:

I. Crop damage
II. Destruction of infrastructure like stoves fences
III. Human injury and death
IV. Disruption of social life e.g. instilling fear among residents
V. Transmission of animal diseases
VI. Soil tramping and
VII. Killing of livestock

Table 7-7 presents specific problems associated with certain wildlife species. The table indicates that the residents viewed the problems caused by particular wild animals differently.

Table 7-7 Wild Animal Species Associated with Problems

PROBLEM	RESPONSE RATE (PERCENTAGE)								
	ELEPHANT	MONKEY	SWINE	ZEBRA	BUFFALO	HYENA	LEOPARD	GAZELLES	OTHER
Crop Damage	63.3	9.5	6.3	4.4	2.5	0	0	3.2	10.8
Infrastructure Destruction	96	0	0	0	0	0	0	4	4
Human death / injury	25	25	0	0	25	0	25	0	2
Disruption of social life	75	0	0	0	25	0	0	0	0
Competition for pasture diseases	16.7	0	0	33.3	16.7	0	0	0	5
Soil trampling	100	0	0	0	0	0	0	0	0
Killing of livestock	0	0	0	0	0	0	25	0	0

The most problematic animal respondents see as causing most damage was the elephant with 63.3 percent response rate. Other common animals included monkeys 9.2 percent , swine, 6.3 percent Zebra 4.4 percent and buffalo 2.5 percent. On destruction of infrastructure and disruption of social life 96 percent and 75 percent of the respondents identified elephant as the

most troublesome. This was followed by buffalo which was identified by 25 percent of the respondents on disruption of social life.

On human body injury and death, 25 percent of the respondents identified elephant, monkeys, buffaloes and leopard as the most often involved. Elephants and buffaloes are known killers when provoked. The survey revealed that monkeys do not fear women and sometimes attack them when they attempt to chase the animals from the farms. The field survey further established that the monkeys sometimes kidnaps little children and may cause injury while playing with them.

Zebra can feed on almost any vegetation leaving the ground bare and exposed to agents of erosion such as wind and running water. These animals rely exclusively for food on grass, thereby making zebra severe competitors. The greatest percentage (33 percent) of the respondents see zebra as the greatest competitor with domestic livestock for pasture, followed by elephants with 16.7 percent. Other wild animals which competes with domestic livestock for pasture includes antelopes, Thomson gazelles, Waterbuck and Elands.

Zebra is also a very docile wild animal and this makes it able to graze side by side with domestic animals. On diseases transmission 50 percent of the respondents identified zebra with this problem. Other wild animals with which respondents associated with decease transmission included elephants with 16.7 percent and Buffalo 16.7 percent. Some respondents were not able to specify which wild animal species transmits diseases to livestock, that can be explained by the level of education. Livestock predators were represented by the hyenas 50 percent and the Leopards 25 percent.

7.4.3 Period When Problems Are Most Intense

Climatic (Rainfall and temperatures) factors determine migratory patterns of wild animals. Long rains occur from March to May and short rains, in October and November. During this period this period the wild animal problems are most intense. The crops by then have germinated and they are just about to be weeded. When asked the season that the problems are most intense 68 percent of the respondent quoted the wet season after crops have matured as compared to 10 percent who indicated the dry season. This corresponded with the arrival of the migratory animals mainly, elephants. This was more prevalent in Kariunga/Mutirithia region. The respondents comprising of

22 percent saw the wild animal problems as occurring throughout the year. This was more prevalent in Ngobit/Sirima and Kariunga/Mutirithia regions which can be explained by the large numbers of resident monkeys in Kariunga/Mutirithia and pigs in Ngobit/Sirima.

7.5 Perceptions about Wild Animal by Small-holder Farmers

The perceptions of local actors differs from one particular actor to another. Since the factors influencing the actors perception are dynamic, their perceptions are also change with time and changing circumstances. Majority of the smallholder farmer actors are young immigrants from the neighbouring central province where the major occupation is crop cultivation. However, due to economic changes that has occurred in the data collection areas since independence attitude toward wildlife by these actors have changed immensely.

When asked whether wildlife should be protected 93.9 percent of the respondents in Ngobit/Sirima, 91.7 percent in Ethi/Laikipia East and 88.9 percent in Kariunga/Mutirithia responded positively. Those who felt wildlife should not be protected accounted for only 7.6 percent in all the data collection areas. This may be explained by constant crop raiding by wild animals making it almost impossible to cultivate especially so in Kariunga/Mutirithia conflict zone.

Reasons advanced by the respondents for the protection of wild animals are presented in Table 6-10. The highest percentage (26.5 percent) of the respondents identified tourist attraction as the major reason for protecting in Kariunga/Mutirithia and Ethi/Laikipia east regions, while attraction of tourism was identified by the majority of the respondents living in Ngobit/Sirima.

Table 7-8 Smallholder Perception on Protection of Wildlife

REASON OF PROTECTION	NGOBIT / SIRIMA	MUTIRITHIA/ KARUINGA	ETHI / LAIKIPIA EAST
Foreign exchange	20.4	27	41.7
Tourist attraction	224.5	38.9	25
Aesthetic	10.2	16.7	8.3
National Heritage	22.4	5.6	0
Creation of Good	22.3	11	25

Other reason sighted by the respondent on why wildlife should be protected includes the support on community projects, by KWS such as water and education projects.

7.5.1 Peaceful Co-existence Between Wild Animals and The Humans

Some animals are more destructive than others. Wild animals viewed as peaceful; offers hope of a possibility of man living with wildlife. When asked whether there is any wild animal they can peacefully live with the highest percentage (88.6 percent) answered in the affirmative as opposed to (11.4 percent) who saw the possibility as impossible. Table 7-9 shows possible wild animals that the respondents viewed they can peacefully live with.

Table 7-9 Most Common Co-existence Wild Animal

CO-EXISTENCE WILD ANIMAL	NGOBIT / SIRIMA	MUTIRITHIA/ KARUINGA	ETHI / LAIKIPIA EAST
Zebra	42.4	40.9	37.8
Gazelles	33	31.8	42.8
Antelopes	24.2	27.2	21.4

The table indicates that Zebra was seen as the most co-existence animal in /Mutirithia and Ngobit/Sirima by 42.2 percent and 40.4 percent respectively. However, Gazelles were identified by the majority in Ethi/Laikipia East. Others included Impalas, Hyrax, Elands, Waterbucks, Rabbits and Hyenas.

While the highest response rate of Zebra might be explained by its docile nature and being cropped for community wildlife projects, Antelopes and Gazelles are likely hunted by the locals for meat to supplement their local diets. While some respondents openly pointed this fact many preferred not since the activity is illegal.

7.6 Coping Strategies of the Smallholder Farmers

On occasion of wildlife damage 97.5 percent of the respondent indicated that they react by guarding to prevent damage of their crops. A farmer could use one or a combination of methods as there are no community based organizations to deal with the menace.

Control by use of noise techniques to distract wild animals was the highest recorded control method in all the three conflict areas with 33 percent, 49.2 percent and 50 percent in Ngobit/Sirima, Kariunga/Mutirithia and Ethi/Laikipia conflict zones.

Table 7-10 Small-holder Wildlife Control Mechanisms

CONTROL METHOD	NGOBIT /	MUTIRITHIA/ KARUINGA	ETHI / LAIKIPIA EAST
Bonfire	28	37.5	20
Noise Scaring	49.2	50	66.6
Throwing Stones	16.4	12.5	3.1
Fence	4.5	-	3.1
Dogs	1.5	-	-

Other control mechanisms used includes, scaring by stone throwing, fencing the farm plot and use of dogs 0.7 percent which was only identified in Ngobit/Sirima. The field survey further established that all the methods were not effective in controlling some animals. On the event of crop destruction the small-holder farmers have to react on other coping strategies which included; seeking for employment, leasing land elsewhere, buying food, reporting to KWS and waiting for relief food.

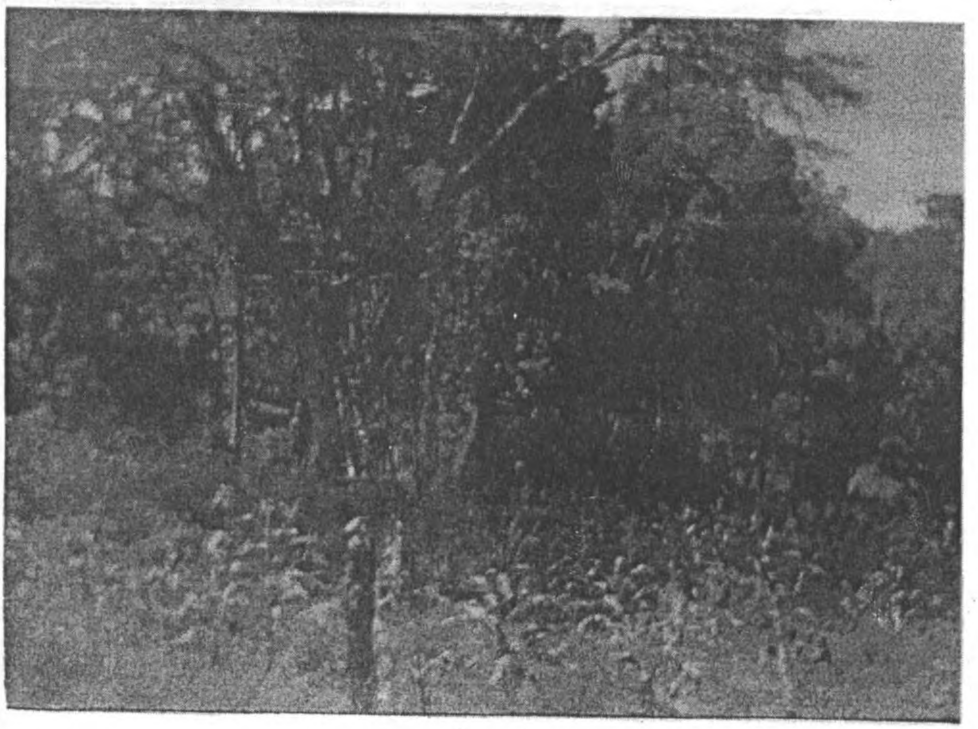
7.6.1 Application of the Control Mechanisms by the Farmers

Farmers could construct elevated platforms built on a tree in the field or guard posts in the middle of the cultivated plots (Plates 7-2 and 7-3). The farmers would stay awake at these guard posts to watch for wild animals. From the safe posts they could throw stones by use of catapults or by hands. On other occasions noise mechanisms such drum beating could be used. Sometimes fire could be used. Some of the methods applied are by the farmers are in the areas that data was collected are described here below;

1. Bonfire is applied by the farmers through burning woody materials and inflammable liquids such as paraffin to produce smoke and flames so as to keep animals away.
2. Scarecrows: Effigies of human beings placed along the fence or in the middle of a cultivated plot. Noise making instruments are often placed together to help scare smaller wild animals such as squirrels and antelopes.

Plate 7-1: Scarecrows used to scare small , wild animals

Plates 7-2 An elevated platform built on a tree in the field



Plates 7-3 A guard-post in the middle of a cultivated plot

3. Noise: Use of objects to produce loud unpleasant sound disliked by wild animals. It is produced through shouting, rattling empty debase and cracking whips.
4. Stones: Aim and throw either by hands or slings to hit with stone to drive the animal out of the farm plot.
5. Dogs: Used to scare and chase small animals like antelopes, dik dik. Occasionally dogs are able to kill them.

7.7 Farmers View on KWS Response to Wild Animal Menace

From the farmers point of view the highest percentage 43 percent pointed out that KWS does not respond fast enough in helping the farmers drive out the animals from their farms. On other occasions KWS never responds at all to the farmers woes. This was recorded by 34.2 percent of the respondents. However, 15.2 percent commented that KWS responds quickly by control shooting while 5.1 percent thought there was no serious trouble to warrant going for the authorities concerned.

On their relationship with KWS 38 percent of the respondents indicated that their relationship is cordial and good while 55.7 percent indicated either there is no relationship or the relationship is poor since KWS cares more for their animals than humans and their property.

7.8 Control Methods by KWS

A number of methods are used by KWS in controlling rogue animals. Some of the methods applied in Laikipia are:-

1. Scaring rogue animals from the settlement areas or from farms by use of short gun.
2. Direct shooting of notorious animals with firearm to hit with bullet and eliminate or kill.
3. Capture and translocation of problem animal.
4. Creation of KWS outposts.

7.9 KWS Conflict Management Strategy

KWS currently allows through an established approval procedure, landowners to venture into consumptive and non-consumptive utilisation of wild animals. Utilisation is however, allowed after elaborate animal census for plains game Zebra, Eland, Impala, Thomson Gazelles among others. Moneys accrues goes to the landowner directly. In the case of Laikipia District landowners have organised themselves into a polarised interest group, the Laikipia Wildlife Forum (LWF). Membership is drawn from the smallholder farmers, pastoralists in the big ranches and large-scale farmers. The smallholder farmers join the LWF in groups since the individual plots are not large enough to qualify quota allocation of wild animal utilisation. Pastoralists join the LWF through group ranches.

This not withstanding, the highest percentage accounting 87.3 percent of the small-holder farmers interviewed indicated that they have never heard of LWF as opposed to 12.7 per cent those who have heard. From these who have heard of the LWF only 7.7 per cent of are members.

7. 10 Summary

The analysis has established that the land use practices of the small holder farmers are closely relate to the practices in their districts of origins. These findings further indicates that since the agricultural practices are from the high potential areas they are not suitable for the ecological

setting of the district which are compounded by wildlife menace. The major challenges facing the district therefore include the inability of the small-scale farmers to meet food requirements and how to integrate this with wildlife conservation.

Cultivation of crops have contributed significantly in fuelling human-wildlife conflicts. The study found destruction of crops as the major problem caused by wildlife. The problem is mostly associated with elephants although other common animals such as monkeys, swines and antelopes caused considerable damage to crops at different stages of crop growth. Other types of problems associated with wildlife include destruction of infrastructure, transmission of animal diseases, human injury and death and livestock predation. Almost all the respondents reacted by guarding their farms to prevent damage of their crops. They applied traditional control mechanisms which are not very effective. The farmers rarely reported wildlife manifestations to the authorities concerned as they were seen as being partisan and unable to respond quick enough while on other cases they too are not effective. This factor have contributed to poor relationships with KWS. For he farmers to be able to effectively control wild animals there is need to adopt better and effective control mechanisms.

Despite the losses incurred through the destruction of crops and infrastructure the small scale farmers do not benefit directly from wildlife resources nor do they receive any compensation for property damage. Benefits which are accrued from cropping Programme only supports community projects which cannot bridge the losses of individual farmers. This limitation has a direct bearing on the perception of small scale farmers and therefore their likely strategies for dealing with wildlife menace. Alternative approaches are therefore needed to address the challenges raised in this chapter so as to integrate conservation goals with human development needs. This will be the main focus of the next chapter.

CHAPTER EIGHT

STRATEGIES FOR WILDLIFE-HUMAN CONFLICT RESOLUTION

8.0 Introduction

This study aimed at investigating conflict typologies, intensity, and effects of conflicts between wildlife and humans. It further sought to asses how the government and the community reach at conflict resolutions and the types of solutions, against the background of the existing policy. Finally, the study aimed to come up with suggested area specific strategies for intervention.

Analysis in chapter seven has shown that human land use activities in particular increased crop cultivation and livestock keeping on the one hand and, the use of the same land by wild animals for their own survival cause the continuing conflict between the humans and animals. In particular increased encroachment of the human settlement on natural habitat that were exclusively for wildlife use exacerbated the conflict. The increased population in the country has made areas of low population concentration like Laikipia attract people from high population concentration.

In the case of study areas, people from the high agricultural potential areas move to settle there as part of government population policy to avail land to its people irrespective of the productive capacity of land compared to the areas where the migrants came from. Although this movement of people to the ASAL districts is a national phenomena, settlement in Laikipia generally and in the data collection areas in particular is of interest to conflict resolution because of the inherent conflict between the humans and the wild animals, which for a long time appears not to have had a lasting solution found. For instance the establishment of small family land holdings for subsistence farming along wild animal migratory corridors has left the animals with no alternative routes for their seasonal migration. Some areas that function as natural habitats for breeding wildlife have also been taken up for settlement. This causes conflict when the animals that are strong such as the elephant have to tear the fences and destroy crops to find their migratory destinations.

These problems continues, but data analysis carried out show that it is possible to utilise range land in the study areas, and indeed the whole of Laikipia District economically so that some limited agriculture where people live can exist side by side with wild animals.

8.1 Findings

The findings of this study are categorised into, conflict typologies and effects of the conflicts.

8.1.1 Land Use Conflicts

The study revealed that over 90 percent of the ecological setting of the land in Laikipia District is unsuitable for crop production. Only parts of West Laikipia where climatic factors (maximum rainfall of 900 mm) are more favourable for farming activities. Other suitable areas for crop production include the slopes of the mountains and along river valleys. These areas are the ones most preferred by a majority of new immigrants, and therefore are more densely populated. Interestingly, the river valleys and the more wet areas have traditionally acted as migratory corridors for wild animals for also many years from Samburu, Mt. Kenya and Aberdares Ranges ecosystems. The study found out that settlement patterns have almost completely cut off Laikipia from the Aberdares and Mt. Kenya ecosystems. The intensity of settlements and subsequent farming methods in Ngobit/Sirima have completely closed the migratory route to and from the Aberdares and Laikipia. Farmers therefore, experience constant invasion by wild animals that use traditional migratory routes that pass through farms of the smallholder farmers.

The result has been the degradation of the environment but more specific to this study, loss of habitat for the wild animals. The consequence of these two conflicting land use systems leads to unsustainability as wild animals are confined in big ranches leading to ecological degradation in some ranches such as Ol Pajeta as shown in Plate 8-1 as a result of heavy concentration of elephants.

From this land use conflicts, one can safely deduce that the main issue of this conflict is the survival needs of the local people. Thus conservation cannot be considered in isolation of the needs of these local actors. Local people would therefore support conservation measures once they are sure of possible economic benefits.

Plate 8-1 Destruction of trees in Ol Pajeta ranch caused by heavy concentration of Elephants

The findings from land use types indicate that all is not lost and allowing continued existence wild animal as an economic land-use type have chances of success. About 57 percent of the total area of the district is owned by ranching companies most of which tolerate wildlife, while only 25 percent is utilised by small scale farmers who are not friendly to wild animals but could be convinced that they stand to directly share in economic gains arising from conserving conserve wild animals. The rest of the land is mostly occupied by the pastoralist whose ways of life are compatible with wildlife land use. Though wild animals have little survival chances in the small scale farms, small scale farmer realise that low densely settled areas present an opportunity to allow utilisation of land by the wild animals through an integrative management intervention. Semi domestication (Breeding of certain wild animal species such as ostrich) of wild animals is one such method of conservation.

8.1.2 Institutional Conflicts

Existing institutional conflicts pitied the government and its agencies on the one hand and the community in the study areas on the other on the other. The conflict is primarily caused by

existing government policies on wildlife in general, and in particular scrapping of compensation scheme in 1989 as well as the ban of sports hunting on the other.

Scrapping of compensation scheme have meant that all the losses by the smallholder farmers from wild animals are borne by farmers themselves. Though the government accepts a general responsibility to assist with control of behaviour of the problematic wild animals, the government itself has found out that it is unable to control all the problem animals. This has forced the farmers to device protective measures themselves, which again goes against the policy and practice of government, as some of the measures involves killing the animals.

To bridge the losses incurred by the farmers KWS has introduced the wild animal utilisation Programme, however the Kenya government is in favour of legislation and policies that promote non-consumptive utilisation. Since the consumptive utilisation through cropping, notable to bridge the losses the landowners experience, the land owners have formed a lobby group Laikipia Wildlife Forum (LWF). Its activities range from carrying out research and establishing quota allocation for all regions in the district. The land owners through the lobby group are challenging the ban on sport hunting which is viewed as lucrative and can generate more revenue.

On the possible benefits that can accrue from sports hunting, culling zebra through sports hunting would bring a net profit of Ksh. 36,000 as compared to normal culling which only earns a net profit of Ksh. 3,000 only per animal. However, ecotourism in the long run is more profitable.

8.2 Effects of the Conflicts on Small-holder Farmers

In general the conflict have resulted into crop damage, destruction of infrastructure, human death and injury, disruption of social life, competition for pasture, transmission of animal diseases, soil trampling and killing of livestock. The degree of these conflicts is a factor of the wild animal species and season. They can be categorized into economic, social and quasi political effects.

8.2.1 Economic Effects

1. Crop Damage: The animals associated with crop raiding included Elephants, Monkeys, Thomson Gazelles, Swines and Zebras among others which caused severe damage to crops such as shown in plates 8-2 and 8-3. The respondents indicated that these animals raided their farms

during the rainy season when the crops have germinated and are just about to be weeded. Swine were identified mostly in Ngobit/Sirima while Monkeys were the major problem animal in Kariunga/Mutirithia. Due to its migratory nature the Elephant was frequently quoted in all the three conflict zones. Residents also acknowledged that it's during the wet season that the largest herds of elephants are noted.

Other resident species like Monkeys in Ngobit/Sirima and Kariunga/Mutirithia which have constantly raided farms as they are residents and could hide in the bushes. Other species like Swine and Waterbucks caused considerable damage to crops. Zebras were only cited in Ethi/Laikipia conflict zone which can be explained by the fact that most of the plots are not fenced. Most of the animals could be cited grazing next to farms while others were noted by foot marks and eye witness accounts of the respondents.

Most of the crops damaged included maize, beans, potatoes, wheat and horticultural crops like cabbages and tomatoes. The crops are damaged at different times and during various stages of growth and at by different wild animal species. During germination small animals like the dik dik, antelopes and gazelles are the most destructive animals. After the remaining maize, have developed cobs and potatoes have developed tubers elephants, monkeys, pigs and porcupines take over. Tomatoes are fed on raided by birds when they ripen. The different crop growth and development cycles due to differences in their physiology and demand for nutrients from their habitat makes these crops mature at different times in growth season, and this attracts the wild animals almost always when the animals arrive.

The study revealed that different wild animal species raided the farms at different periods of the day. Elephants invaded the farms at night retreating at dawn. The elephant eat, trample and even uproot the crops at night. Monkeys, bushpig, porcupines that would retreat in surrounding bushes on uncultivated land damaged crops during the day. Almost all the respondents reported crop damage by wild animals. Those whose crop have not been damaged reported having seen the destruction on their neighbours' farms. The high rate of crop damage in these regions is due to the presence of wildlife within the region and large unsettled bushy patches and the uncultivated neighbouring ranches which provided refuge for the wildlife.

Plate 8-2: Remains of maize stalk on a smallholder farm earlier destroyed by wild animals

Plate 8-3: A stand of recently destroyed maize crops by wild the animals

2. Destruction of infrastructure: Destruction of infrastructure was reported by the respondents with elephants was cited as the most destructive animals. Local people complained of destruction of their fences by elephants as the animal create ways to enter the farms. Elephants are also associated with destruction of food storage as they look for harvested maize. Residents reported that elephants are capable of destroying all types of structures that they built, if the structures stand on their way.

3. Livestock Perdition and Livestock Diseases: In all the three conflict areas majority of the respondents kept livestock which formed both an important component in dietary provision and raising cash to attend other family needs. Most of the livestock kept included cattle, sheep, goats, donkeys and sometimes chicken. They provided milk, meat, transport and sometimes sold to purchase foodstuffs that are not available or pay school fees for children. Residents reported cases of killing of livestock.

The study identified the hyena and the leopards as the major predators preying on small livestock like goats and sheep. Other predators like lion prey on cattle while smaller predators like the mongoose go for chicken. Residents were also concerned with disease transmission from wild animals to livestock. Diseases transmitted included East Coast fever and Trypanosomiasis (ECF) which are transmitted by tsetse fly and ticks respectively. These diseases do not affect the wild animals as much as they do to livestock. In addition the collapse of cattle dips was cited by the farmers to have left them without disease preventive measures. Finally, the wild animals compete for foliage with livestock.

8.2.2 Social Effects

1. Human Death and Injury: Residents revealed that besides the economic losses, by way of crops that are destroyed, wild animals posed a great threat to human life. They cited elephants, monkeys, buffalo and leopards as responsible for charging at people and wounding them, sometimes causing death. Some of these cases occur when farmers are preventing their crops from destruction by the animals. Other incidences of attack affect women who are attacked by the animals as they fetch domestic water or while looking after their livestock. Though compensation for human death and injury still exists the procedures and period taken before the family is paid is quite often very long. Sometimes the actual payment is never made.

2. Disruption of Social Life: The presence of wild animals that inflict injury or kill people caused a state of fear and uncertainty in the study areas. The study revealed that Buffaloes, Elephants and Leopards caused a lot of insecurity thereby disrupting social life. Teachers and children indicated that they are sometimes not able to arrive in school on time due to fear instilled on them, at the same time leaving early before the normal school hours. This has affected the school curricular adversely besides the performance in national exams.

3. Political effects: The conflict have led to enmity and mistrust between the government and the local people. The government bears the responsibility to protect the lives and property of every citizen anywhere in the republic. The local people perceives the government to have denied them their rights for protection by leaving them to defend themselves from wild animals, yet not to kill them.

8.3 Strategies of Conflict Resolution

The previous section has primarily presented the findings of the study. Encroachment of land that was previously used by wild animals and now turned for intensive crop cultivation is the major cause of existing human-wild animal conflict. Suggested conflict resolution strategies are premised on an eco-development approach. In an ideal situation the solution to the conflict would be to prevent wildlife completely from the smallholder farms. This will reduce wildlife-human conflict to manageable levels. This strategy would entail spatial separation of wild animals from human settlements by restricting movement of both the wildlife and the humans. Any other measure that could lead to eradication of wild animals is ecologically and economically misguided.

One way of achieving this is through integrating human land use activities that are compatible with wildlife conservation. The practicability of this strategy can be achieved through land use planning and zoning. Figure 8-1 presents the proposed wildlife dispersal and corridor zone;

1. Zone I: Areas of low conflict. These includes large-scale ranching areas and pastoralism areas where traditional livestock keeping is in harmony with wildlife land-use.
2. Zone II: Areas of high conflict intensity: These are areas bordering ranches, forests, river valleys especially along migratory corridors and sub-divided plots that are sparsely populated (density of less than 75 persons per KM^2). The study areas of Kariunga/Mutirithia and

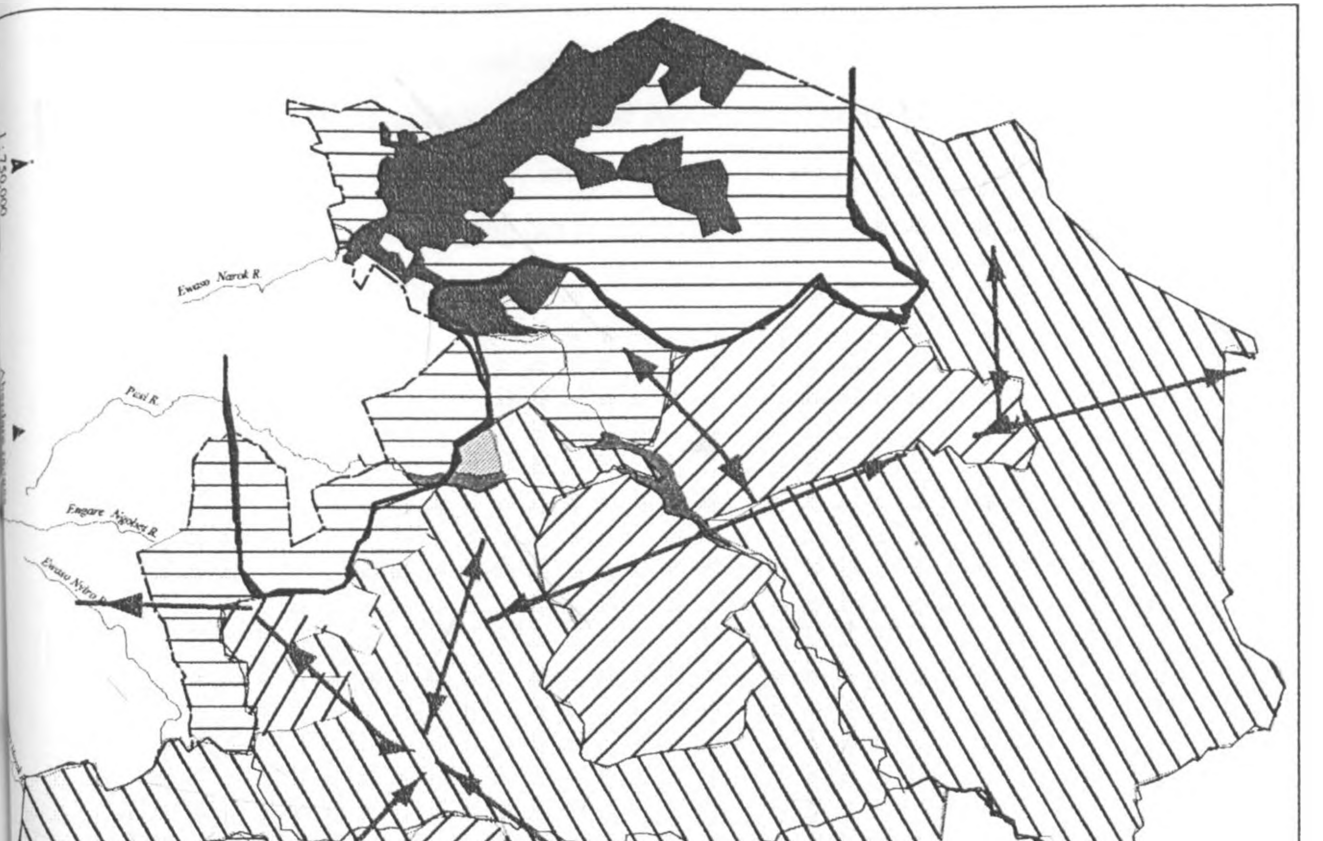
Ethi/Laikipia East regions falls within this zone. For Ngobit/Sirima only a small section falls under this category. In these areas crop cultivation is in conflict with wildlife land use.

3. Zone III: Areas of no Human-wildlife conflict: These are densely populated crop production and other areas of high population density such as the towns. In these areas there is no human-wildlife conflict because there is no refuge for wild animals and the animals also tend to shy from human beings.

To achieve a long lasting human-wildlife conflict resolution a corridor should be conserved as a dispersal and migratory zone between the Samburu national park, the Mt. Kenya and the Aberdares ecosystems through Laikipia district. The area forms the current migratory route of elephants. It consists of large-scale ranches most of which tolerate wildlife and small sections of small scale farms and a few large-scale ranches who do not tolerate wildlife.

In the event of gazettment of the area falling within the dispersal zone, the farms can be acquired through the land acquisition Act and farmers compensated for their loss. The alternative strategy would be consolidation of the small scale farms. However, farmers willing to continue settling along the gazetted dispersal area should so under the condition that they will not interfere with the movement of wildlife.

A fence surrounding the areas where wild animals can access and destroy crops in areas where they have very little survival will go along way in solving this conflict. A suitable barrier can be elected to separate the dispersal zone and the exclusive human settlement areas. A suitable barrier could be an electric fence or even planting of *Opuntia ecultata*. Area specific strategy recommendations will focus on the proposed wildlife migratory corridor/dispersal zone.


Ewaso Narok R.
Pusi R.
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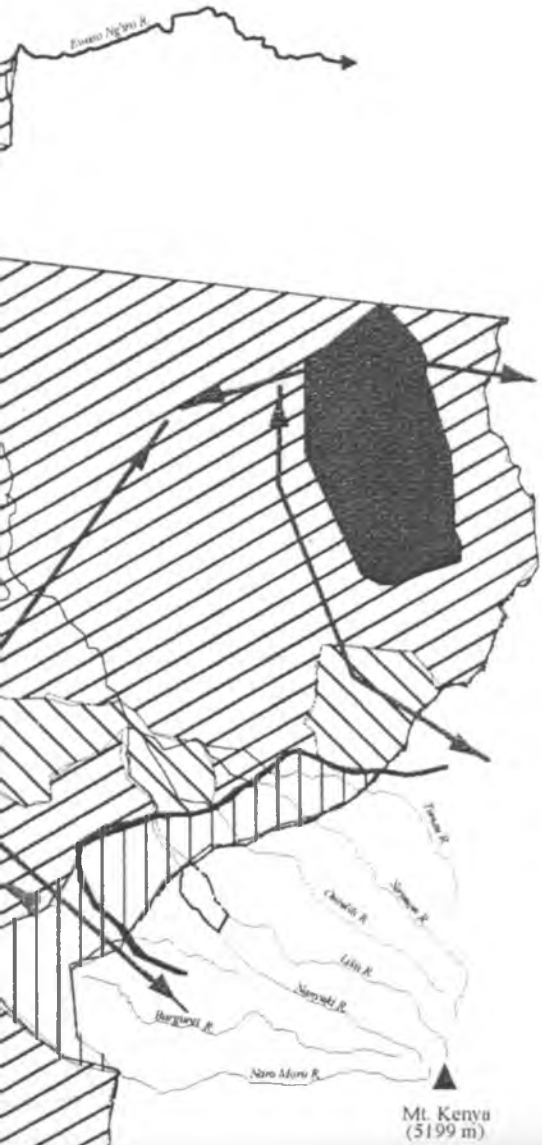

FIG. 8 - 1

Laikipia District, Kenya

Model for Conflict Resolution by Land Use Planning

- Forest
- Swamps
- Zone I (Areas of low conflict intensity)
- Zone II (Areas of high conflict intensity)
- Zone III (Area of no human Conflict)
- Proposed wildlife Migratory corridor
- Migratory Route
- District boundary
- Planning unit boundary
- River

8.3.1 Specific Area Recommendations

Wildlife is a viable economic land use for the marginal lands when well managed. According to the findings in the data collection areas the production of crops cannot meet both the household needs and ecological sustainability. Integrating wildlife conservation with compatible agricultural practices such as livestock keeping can produce more long term economic benefits compared to the current subsistence farming of crop and livestock. Thus area specific strategies should focus on encouraging farmers settling in the dispersal corridor to practice land use activities that are harmonious with wildlife conservation such as livestock and bee keeping. Land use activities not in harmony with wildlife conservation should be discouraged. If this zone is conserved it will act as a dispersal area for migratory animals without a lot of damage to human settlement and their investments on land. It currently serves as a dispersal zone for migratory wild animals. Therefore, in future general management plans it should be taken into account so as to integrate development taking place with conservation. The following suggested strategies are recommended for this specific area.

1. Effective strategies of controlling the problematic wild animals should be instituted to help minimise the losses. The methods currently used should be improved to make them more effective. This could be done through the provision of modern devices such as carbide gas and other mechanical noise makers and flash lights at subsidised rates to farmers.
2. Government should help the farmers in the control of animal diseases through rehabilitation of cattle dips. Spraying of wild animals such as zebras and buffaloes will also minimise the rate of infection to domestic animals. Other vices that discourage livestock keeping such as cattle rustling by pastoral communities, should be discouraged through beefing up of security personnel.
3. Sport hunting is a sustainable wildlife utilisation and is more profitable. Since the region is not attractive to tourists, sports hunting can be introduced on pilot basis. For example the current wildlife utilisation through quota allocation can be re-allocated for sports hunting. However caution should be taken due to misuse through poaching.
4. An efficient compensation scheme to all damages incurred by wildlife should be placed. A revolving fund can be created by allowing sports hunting in the region. Through involvement of local conservation organisations such as LWF.

5. To support long term conservation strategies local communities should be given more responsibilities to manage wildlife in the region as well as encouraging sustainable wildlife management. Co-existence between human and wildlife can be achieved through control of problematic wild animals, quick and efficient compensation mechanisms and sharing of benefits accrued from wildlife. Smaller mammals that do not pause a great threat human life such as Monkeys, Zebras and Swines which were identified as some of the most troublesome animals can be delegated to the local people who should be trained on modern control methods at the same time be paid for the work done. The animals that threatens human life should be left to KWS for control.

8.4 Summary and Conclusion

The increased population in the country has made areas of low population concentration like Laikipia attractive to people from high population areas of Central Province who have moved to settle there as part of government population policy of availing land to its citizens without taking due regard to productive capacity of the land compared to the areas where the migrants came from.

The study noted that the pre-colonial and the colonial land use practices of pastrolism and ranching were in harmony with wildlife land use. It is these practices which have helped the survival of wildlife in Laikipia district. The post colonial government policies of settling the landless saw huge migrations of communities who are mainly agriculturists settling in Laikipia. Based on their historical backgrounds which have shaped their attitudes, perceptions and strategies they have put their small subdivided plots into intensive crop farming. These practices are both in conflict with the ecological setting and wildlife land use. It is this changes which are currently taking place in Laikipia that have set the arena of conflict.

It was found out that there is a direct relationship between the rainy season and wildlife migration patterns that shed light on factors regulating their movement along the migratory routes. Animals concentrated in large numbers in Ngobit/Sirima which is along the migratory corridor. More damages were experienced to plots closer to the ranches and river valleys and varied with different animals in different seasons. Crop damages was the most prevalent problem reported in all the three data collection areas as opposed to others experienced in specific localities. These problems

included killing of livestock by predators, transmission of diseases from wildlife, competition for pasture and destruction of infrastructure such as store and fences which indicated beyond any reasonable doubt that the wild animals invaded the farms quite frequently.

Besides, the wild animals caused a constant threat to human life and would at times injure or kill people. KWS in the region have tried various strategies to create good relationship with the local communities among them control of troublesome animals and wildlife utilisation through cropping which in turn earned some income to support local development projects. However, it was found out that KWS is not able to contain the problems to acceptable proportions due to inadequate personnel and lack of equipment's among others. The cropping strategy have not been very successful since the losses incurred by individual farmers could not be bridged by finance of community projects.

On occasion wildlife manifestations local people small-holder farmers reacted by protecting their farms from wild animals or driving them out from their farms. Other strategies entailed guarding using traditional techniques which too were not very successful. The peasant farmers are aware of the national importance of wildlife and profits accrued by the state through foreign exchange and tourism. The factors were considered as values that cannot justify individual gains and wildlife was considered more of a nuisance. Survival of the individual is of paramount importance which wildlife threatens. These dilemma can be reconciled if local communities are encouraged to take conservation friendly practices such as bee keeping and ecotourism related projects.

With proper land use planning and proper management that helps the small scale farmers to utilise wildlife as a land use gain tangible benefits that bridge their current farming practice it is possible to resolve the conflict in Laikipia District and maintain sustainable and co-ordinated regional development. Nevertheless, for the small scale farmer the potential is very far from being realised, for him to start deriving any benefits. On the one hand these actors are hindered from exploiting this potential by both government policies and their cultural norms and practices. The sophistication, knowledge and capital involved in tourism related investments is far beyond the reach of the peasant farmers. Until this scenarios are reconciled it will be difficult for the peasant farmers to appreciate living with wildlife.

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APPENDIX 1.0

Human - Wildlife Conflicts in Laikipia District:
Area Specific Strategy Recommendations

SMALL-HOLDER QUESTIONNAIRE

Questionnaire Number.....

A. PERSONAL DETAILS

1. Name of interviewee.....
2. Sex Male ( )
   Female ( )
3. Age.....(Years)
4. Occupation: Commercial.....
   Subsistence.....
5. Location.....
6. Sub-location.....
7. Date.....

B. HISTORICAL BACKGROUND

1. What is the District of your origin ? .....
2. How often do you visit the place of your origin
   a) Weekly ( )
   b) Monthly ( )
   c) Twice an year ( )
   d) Yearly ( )
   e) others (specify) ( )

2. Explain the reasons for your visits
   .....
   .....
   .....
4. How do you perceive your life here? Permanent ( )
   Temporary ( )
5. Explain .....

C. ECONOMIC ASPECTS

1. What is the size of your farm in (acres)
   .....
2. What crops do you grow
   .....
3. Do you keep any livestock? Yes ( )
   No ( )

4. Which ones?

.....

.....

6. What is the size of your harvest for the last four seasons per crop?

Crop	Season 1 Bags/or Kgs	Season 2 Bags/or Kgs	Season 3 Bags/or Kgs	Season 4 Bags/or Kgs

7. Is it enough for your subsistence? Yes ( )
No. ( )

8. How do you supplement the out put?

.....

.....

9. What are the major problems that you face? Mention at least five in order of importance.

b).....
c).....
d).....
e).....

D. WILDLIFE CONFLICT ISSUES

1. Are there any wildlife animals in your neighbourhood? Yes ( )
No ( )

2. Name the type of animals that you see in your neighbourhood

.....

3. Do you encounter any problems with the wild animals.
Yes ( )
No ( )

4. What types of problems?

.....

5. When are the problems most intense? (Places)

.....

6. Has this been always the case Yes ( )
no ( )

7. Explain .....

.....

8. Name the most troublesome animals

a) .....

b) .....

c) .....

d) .....

e) .....

9. Have you had any conflicts with the wild animals Yes ( )
No ( )

10. What kind of conflicts you have encountered associated to each of the animals

Animal	Conflicts
.....	.....
.....	.....
.....	.....

11. Have you ever suffered any loss or damage from wild animals

.....

12. What was the nature of loss or damage?

.....

13. Did you apply for compensation Yes ( )
No ( )

14. What amount of claim did you apply for?

.....

15 was the loss compensated? Yes ( )
no ( )

16. How much were you paid?

Kshs. .....

17. How long did it take for the payment to be paid?

.....

18. In your own opinion do you think wildlife should be protected?

Yes ( )
No ( )

19. Why should wildlife should be protected

.....

20. Do you gain any benefits from wild animals Yes ( )
No ( )

21. List them

a) .....

b) .....

c) .....

d) .....

22. If the troublesome animals you have mentioned are removed would you co-exist with other animals? Yes ( )
No ( )

23. Mention the wild animals you can co-exist peacefully with

a) .....

b) .....

c) .....

24. Do the neighbouring wildlife ranchers fences offer any protection against wildlife menace to the small-holder farming communities? Yes ( )

No ( )

25. What kind of protection do they offer?

A) .....

b) .....

c) .....

26. What is your view regarding the ranchers in reference to wildlife menace?

.....

.....

E. CONFLICT RESOLUTIONS AND STRATEGIES

1. As a farmer what mechanisms are you putting in place to control wildlife menace?

.....

2. What other copping strategies do you adapt for dealing with the wildlife related conflicts? (You may have more than one coping strategies as the answers)

Leasing land elsewhere ( )

Engaging in employment ( )

Planning to out migrate ( )

Fencing the farm plot ( )

others (specify) .....

3. How often or does the KWS respond quickly as per your expectations to cases of wildlife infestations?

.....

.....

4. Please explain

.....

.....

5. What is the relationship between you as a farmer and the KWS?

6. As a community have you previously organised for village groups to enhance security against will life infestation Yes ( )

No ( )

7. If yes how is this being done .....

.....

8. Are there any game scouts in this area? Yes ( )

No ( )

9. If yes, how do they assist the farming community in resolving the wildlife-related conflicts?

.....

.....

10. Is your plot fenced Yes ( )

No ( )

11. What kind of fencing is this? .....

.....

.....

12. Have you ever heard of LWF Yes ( )
No ( )

13. How did you come to know about it? .....

14. Are you a member of the LWF Yes ( )
No ( )

15. What benefits do you gain from being a member?

.....

.....

16. If you have heard of LWF and you have not enlisted as a member why have you not done so? Please Explain.

.....

.....

APPENDIX 2.0

Human - Wildlife Conflicts in Laikipia District:
Area Specific Strategy Recommendations

RANCHERS GUIDED QUESTIONNAIRE

1. What is the name of your ranch
   .....
2. What is the size of your farm? (Acres)
   .....
3. What type of fence have you used
   .....
4. Do you have any wild animals in your ranch?
5. Name and estimate them

Wildlife Species	Population size	Wildlife Species	Population size

6. What major problems do you experience from the wild animals related damage
   .....
   .....
   .....
7. What strategies do you adopt for protection?
   .....
   .....
8. Approximate the amount of losses in Ksh. .....
9. A) Have you ever applied for compensation
   B) What fraction of the claim was made and after how long
10. What benefits do you accrue from wild animals
    .....
    .....
11. Despite the shortcomings would you mind the presence of wild animals in your ranch?.....
12. What strategies would you like to be adopted by the KWS?
    .....
    .....
13. What contribution would you extend in this direction