

# GOAT REARING AS A LIVELIHOOD STRATEGY OF TURKANA

## PASTORALISTS IN NORTH WEST KENYA



A dissertation submitted to the Centre for Development Support in partial fulfillment of the requirements of the degree of Master of Arts in Development Studies of the University of the Free State, South Africa

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## **ABSTRACT**

The increasing human population, urbanization and the demand for a higher income, coupled with changing consumer preferences are creating a greater demand for livestock and their products. Generally, goats are ubiquitous and contribute significantly to the subsistence, economic and social livelihood of a large part of the rural population in low-input, smallholder production systems in the developing countries. Goats have many advantages over other livestock in that they can be utilised as a source of meat, hides, fibre and milk, and secondary products developed from these sources.

Although the importance of goats is well recognized in Turkana, Kenya, this aspect has not been well documented. This study aims at contributing and filling this information gap. The overarching purpose of this study is therefore to investigate goat rearing as a sustainable livelihood strategy of the pastoralist communities. Goat rearing will also be compared with other livelihood strategies in the Turkana district. The study also identifies several stresses or constraints to goat production, and recommends on the way forward to improve goat production efficiency.

The study was conducted between January-June, 2008, in three regions (Northern, Central and Southern region) of the Turkana district. The study utilized a questionnaire with 471 respondents which provided general household information, such as the productivity of goats, the income from goats and the policy environment. A Focus Group discussion guide, targeted at 6 goat production discussion groups, was aimed at collecting information on goat rearing practices, the livelihoods, cultural issues, motivations to goat rearing, etc. An observation guide was used as an inventory of all the livelihood activities of these communities. 24 checklists were used to record an in-depth interview and to collect information on detailed institutional livestock production policies and trends with 6 key livestock owner respondents.

According to this study, livestock production emerged as the main livelihood of the Turkana pastoralists. Of the livestock farmed, the animals most kept by the Turkana pastoralists are goats, followed by sheep. The other livestock farmed are

cattle, donkeys, camels and poultry. Few people reared poultry intensively. Most of the respondents kept a flock of 50 to 100 goats. The main reasons identified for the rearing of the goats were that goats firstly provided money to maintain the family. Other reasons given were goats provided money for school fees, dowry, and cultural purposes. Of the other livelihood strategies pursued by the households were fishing, business, petty trade, hunting and salaried employment. The results also showed most of the goats owned to be mainly acquired through inheritance. Alternative ways of acquiring goats included kinship, gifts, raids and dowry. The results also showed that the mothers of the household made most independent decisions regarding the use of milk, skin and blood. The fathers on the other hand made the decisions regarding the utilization of the whole goat (meat, etc).

The results generated also indicated that most respondents sold goats on a monthly basis. Few pastoralists however sold their goats after longer periods of time e.g. 3 to 6 months. The best motivation regarding the sale of goats was to buy food and other necessities for the family. Other motivations for selling goats included medical care, school fees and to alleviate drought situations. The Turkana pastoralists mainly farm with the local breeds (East Africa goat), while exotic breeds only accounted for 1% of the total goat production. The main challenge in the rearing of goats is drought. The other challenges cited were insecurity, theft, diseases and infertility. The main causes of mortalities among goat kids in the various regions were diseases, which accounts for 92% of all deaths. Other causes of losses were difficult births and injuries due to accidents. The areas requiring assistance from the Government and humanitarian agencies include restocking aid, food relief, pasture availability, animal health and extension on cross breeding programmes.

The overall conclusion is that through this study it has been possible to show the importance of goat rearing as a sustainable livelihood strategy of Turkana pastoralists in North West Kenya. It is also hoped that this study will contribute to the improvement and the understanding of the role of goats in Kenya, and to a greater extent, in the arid and semi-arid lands (ASAL)-ultimately aiming at improving the quality of life of the pastoralists.

**Key Words:** Goat Rearing, Livelihood, Strategy, Pastoralism, Turkana

## **DECLARATION**

I, the undersigned, hereby declare that this dissertation, submitted for the awarding of a Master of Development Studies at The University of the Free State (UFS), Bloemfontein, South Africa, is my own work and has not previously been submitted to any other institution of higher education for the awarding of any degree. All sources that I have used or quoted have been indicated or acknowledged by means of a comprehensive list of references.

Signature.....

(Chris Aletia Imana)

Date.....

## DEDICATION

My dedication goes to:

- My wife (Susan A Aletia) and my children (Alexia A Aletia and Adrian N Aletia): For their inspiration, support and encouragement and their patience that always made me keep the hope alive.
- My Late Father: Lokur Lochaan (who was killed by cattle rustlers when I was writing this dissertation)

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Above all, Glory to God.

Chris Aletia Imana

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## **LIST OF ABBREVIATIONS**

<b>ALRMP</b>	<b>Arid Lands Resource Management Project</b>
<b>ASAL</b>	<b>Arid and Semi-Arid Lands</b>
<b>CAE</b>	<b>Caprine arthritis</b>
<b>CAHWS</b>	<b>Community Animal Health Workers</b>
<b>DFID</b>	<b>Department for International Development</b>
<b>EA</b>	<b>East Africa</b>
<b>FAO</b>	<b>Food and Agricultural Organization of The United Nations</b>
<b>FGD</b>	<b>Focused Group Discussion</b>
<b>GOK</b>	<b>Government Of Kenya</b>
<b>IDI</b>	<b>In-Depth Interview</b>
<b>ILRI</b>	<b>International Livestock Research Institute</b>
<b>KMC</b>	<b>Kenya Meat Commission</b>
<b>Kshs</b>	<b>Kenya Shillings</b>
<b>NARP</b>	<b>National Agricultural Research</b>
<b>NGO</b>	<b>Non-Governmental Organisation</b>
<b>PRSP</b>	<b>Poverty Reduction Strategy Paper</b>
<b>SLA</b>	<b>Sustainable Livelihood Approach</b>
<b>SLF</b>	<b>Sustainable Livelihood Framework</b>
<b>SPSS</b>	<b>Statistical Package for Social Scientists</b>
<b>VSF</b>	<b>Vétérinaires sans Frontières</b>

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# CHAPTER ONE

## 1. INTRODUCTION

### 1.1. Background to the study

More than one billion poor people live in the rural areas of the developing countries. Of these, an estimated 680 million people, representing about two thirds of the rural poor, keep livestock - confirming the importance of livestock in their livelihoods. According to Stroebel (2004) and DFID (2000b), an estimated 70% of the poor are women for whom livestock (especially small ruminants), play an important role, and often represent their most valuable asset and provide an important source of income. The need to address the interests of livestock-keeping communities in East Africa has resultantly increased dramatically over the past few years, prompting National Government, NGO's and international donors to explore high impact interventions for these people.

Pastoralists are generally referred to as people highly dependent on livestock and natural pastures for their basic food, income and social needs. The national policy of ASAL-Kenya subsequently refers to pastoralists as those people of whom 50% or more of the gross household revenue is generated by rearing livestock or livestock production related activities. The pastoralists are thus dependent on animal products like milk, blood, meat, hides and skins for their livelihoods (GOK, 2004)

Livestock production contributes to the livelihood strategies<sup>1</sup> of more than two-thirds of the world's rural poor and to a significant minority of the peri-urban poor. The poorest of the poor often do not own livestock. If however they could acquire livestock to help them along a pathway to facilitate poverty alleviation, it would be a great step forward for those people. Livestock thus contributes to the food and nutritional security and helps generate income in the rural poor communities. It is also an important mobile means of creating wealth. Additionally, Pastoralists also use livestock as means of transport and on-farm power and fulfills a wide range of socio-cultural roles (ILRI, 2006)

The goat (on which the attention will be focused in this study) was one of the first animals to be domesticated by humans, about 9000 years ago. Currently, there are more than 200 goat breeds globally, which produce a variety of products, including milk, meat, blood, hair and hides. Worldwide, goat meat production is higher than that of cattle or hogs (Coffey et al., 2004). According to a report by the FAO (Stroebe, 2004), 94% of the 674 million goats in the world are found in the developing countries. Africa and Asia account for almost 81% of this number, with the largest concentration of goat being in Africa, and specifically Nigeria, Sudan, Ethiopia, Kenya and Somalia.

### **1.1.1 Pastoralism in Kenya**

The Turkana people of Kenya are classified as pastoralists and inhabit the Turkana District, which is located in the North West part of Kenya. The district is one of the 17 districts in the Rift Valley Province, the largest district in Kenya having 8 divisions. The Turkana district borders the Marsabit and Samburu Districts to the east, Baringo and West Pokot Districts to the South and shares international borders with Ethiopia to the north, the Sudan to the North West and Uganda to the West. The Turkana district lies between the longitudes 34° 0' and 36° 40' East, and the latitudes 10° 30' and 5° 30' North. It covers a total area of 77000 sq km, which is 42.4% of the total area of Rift Valley province (GOK, 2001).

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<sup>1</sup> Livelihood strategies refer to activities that constitute a regular cycle of the household's quest to meet the basic needs.

Livestock rearing by pastoralists traditionally represents the main economic activity in East Africa and is the major source of livelihood for most households. Agricultural production is however very limited and economic diversification is still very rare. Fishing activities are practiced in the coastal areas, while most of the other food supplements are imported. This has thus led to strong dependence on livestock (FAO, 2001).

The last Kenya Livestock Development Policy was formulated in 1980. This policy emphasized the importance of increased production to make the country (Kenya), self-sufficient in livestock products. Thereafter, many livestock policy issues have been addressed in various other policy documents. Some of which include the National Agricultural research phases (NARP I and NARP II). These documents stressed the need to improve livestock production as a livelihood strategy (Stroebe, 2004).

During the 1999 Population and Census report, the population of the Turkana district (Kenya) was reported to be 450860 people. Of these, 70% are comprised of nomadic pastoralists. The spatial distribution of this district's population is critically determined by rainfall, water and the availability of pasture for the livestock (GOK, 2001).

## 1.2. Statement of the Problem

Food shortages remain one of the most serious challenges facing humanity today. The threat of starvation is most critical in Africa, where an estimated 33% (138 million) of the population, mainly women and children, suffer from malnutrition. The situation is even worse in sub-Saharan Africa where more than 50% of the people live below the poverty line (defined as an income of less than 1 US\$ per day). So, in Kenya, more than 50% Kenyans currently live below this poverty line (Stroebe, 2004).

Poverty has long been recognized as a major threat to a significant section of the Kenyan households. The government has demonstrated a high priority to encourage the growth of economic opportunities for the low income people on farms with livestock. The Kenya National Livestock Development policy of 1980

(Stroebe, 2004) emphasized and encouraged livestock improvement through improved rearing, breeding and selection of animals. The policy reported the pastoral community diets to consist of 75% livestock products and further stressed goats and sheep to have an advantage over other livestock farming. These small ruminants require less energy per kg of meat produced, have shorter production cycles, faster growth rates, and therefore a higher potential income. Apart from the supply of products, goats are able to make productive use of a large percentage of the available arid lands, where the scarcity and variation of natural resources limit alternative uses (GOK, 2004).

Livestock as such are the main source of wealth to these pastoralists, and income is derived from the sale of livestock and their products. It is therefore apparent that livestock is the basis of the pastoralists' livelihood. Research has shown that these pastoral livestock production systems among communities living in Africa's arid and semi-arid lands, still provide the surest potential means of escaping poverty. Research undertaken among the Maasai in Kenya and Tanzania has also revealed that the poorest pastoral families and those most vulnerable to droughts are those that have been dispossessed of communal lands and livestock by the on-going large-scale privatization of rangelands in favor of conservation and commercial crop farming (ILRI, 2006). Researchers have carried out similar research, so for example Kosgey (2008) conducted research on small ruminant production in smallholder and pastoral farming systems in Kenya. Similarly Omosa (2005) performed a survey in Turkana District on the impact of water conflicts on pastoral livelihoods and Heffernan and Misturelli (2000) carried out a study in Kenya, on the delivery of veterinary services to the rural poor pastoralists.

The findings of these studies did however not address the specific issues of goat production as a livelihood strategy of the Turkana pastoralist. These were issues focused on the importance of livestock production and specifically the goat. The major contributions of goats to the household, food adequacy, goat contribution to household income, etc. were not emphasized. This current study is an effort to bridge this knowledge gap and benefit the pastoralist.

This study may in turn bring about improvement of the policy and set the stage for further research on livestock rearing as a livelihood among other rural communities in East Africa and beyond.

### 1.3. Research Objectives

The aim of the proposed study was to investigate goat rearing as a livelihood strategy of the Turkana pastoralists in North West Kenya. Specific objectives were the following:

- a) To establish the extent to which goat rearing, as a livelihood strategy, is practiced among the Turkana pastoralists of North West Kenya
- b) To identify other livelihood strategies among the Turkana communities
- c) To establish whether goat rearing is a sustainable livelihood in the Turkana community
- d) To establish the various stresses or constraints to goat production in the Turkana community
- e) To draw conclusions and make recommendations based on the study findings

### 1.4. Justification of the Study

The Turkana district in the North West part of Kenya is one of the most remote and marginalized areas in Kenya, with widespread poverty and prevalent food insecurity. In this district, livestock production is the principal income-generating factor to improve livelihoods and the quality of life. The arid and semi-arid areas are particularly vulnerable, and require conservation and protection (Mbuku, 2006). In the past, the Turkana people have relied on livestock, especially small stock to utilize this area. This practice has thus continued to be the potential food source and income generating activity of these people.

This study may contribute to developing a structure of knowledge generation involving goat rearing and the improvement of production. The study may also help formulate a practical approach to the methods implemented in this investigation. There is the increased demand for animal protein (mainly from ruminants), fuelled by increased human consumption. This research may also bring about suggestions that may improve the existing livestock policy in Kenya. The livestock policy

currently in use was formulated in 1980 and needs to be updated. The recommendations of this research may also influence the Kenyan Government to focus on goat rearing as a major livelihood for all pastoral tribes. It may also change the way the Government and the community view the contribution of small stock production, especially using goats, as a sustainable livelihood.

## 1.5. The Study Area

The Republic of Kenya is situated on the coast of East Africa and stretches longitudinally from 4° S and 4° N and latitudinally from 34° and 42°E. Kenya has a surface area of 583000 km<sup>2</sup>, and is bordered by Indian Ocean, Somalia, Ethiopia, Sudan, Uganda and Tanzania. The human population of Kenya is estimated as 34 million (GOK, 2001).

The Turkana district is one of the ASAL districts of Kenya, and lies to the North West of Kenya. Its agro-ecological zones are VI and VII with extensive plains. The district covers a semi-arid region of approximately 77000 km<sup>2</sup>. The district is bordered by the Uganda escarpment in the West, the Sudan and Ethiopia border to the North, Lake Turkana to the East, and the Kenya districts of West Pokot, Baringo and Samburu to the South. The district is 100% ASAL (arid and semi-arid lands), with an average annual rainfall ranging between 100 and 600 mm. The district's annual rainfall is too low for intensive farming, thus pastoral production is the most important economic activity (Aemun, 2006).

The district of Turkana is categorized as trust land, with rangelands suitable for pastoralism, and small parts suitable for annual crop production. Scarcity of water in terms of quality and quantity is a major handicap in the development of the district - as water plays a critical role in development through provision for domestic, industrial and agricultural needs, for which there is no substitute. Therefore, the availability of water largely determines the presence of human activity.

The Turkana pastoralists are classified as Nilo-hamites. They speak one language, *Ng'aturkana* and inhabit the low-lying plains, characterized by a semi-desert environment. The human population of Turkana district is estimated to 497779

(GOK, 2007). The area has suffered from years of neglect by the central government during the colonial era. According to a report by Christian Aid (2000), the British authorities made this area a 'closed frontier', where movement was restricted and most economic activities shut down. The area was seen as hostile and lawless. Successive colonial administrations dealt with the region by backing settlers from elsewhere in the country and investing only in a few high potential areas, at the expense of the rest of the region.

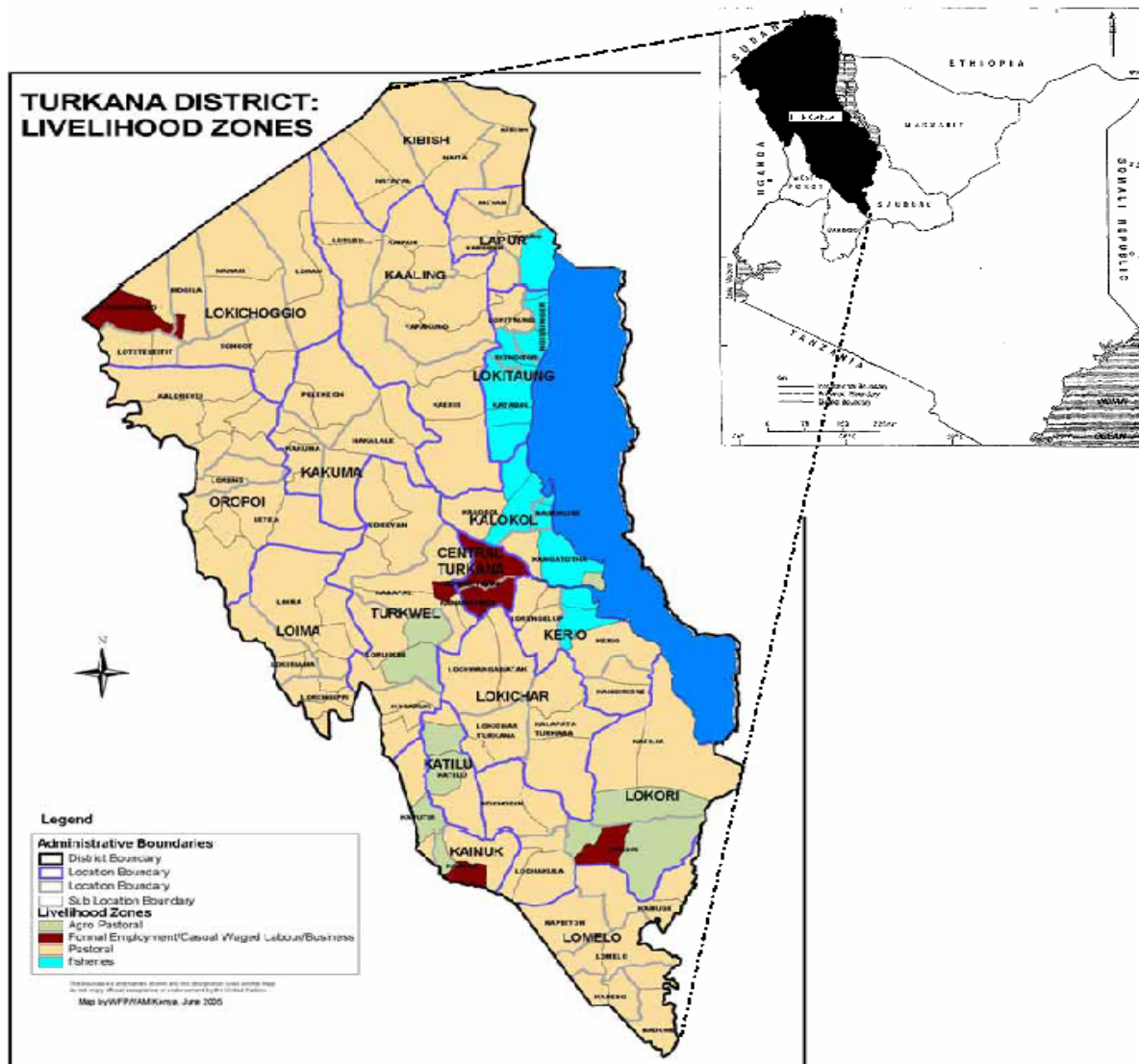


Figure 1: Physical location of (a) Divisions and regions used for data collection (b) Location of Turkana District within Kenya (Aemun, 2006).

## **CHAPTER TWO**

### **2. LITERATURE REVIEW**

#### **2.1. INTRODUCTION**

The threat of human starvation is deemed to be most serious in Africa (World Bank, 2000, cited by Heffernan, 2004). The literature further points out that an estimated 33% (138 million) of the population, mainly woman and children, suffer from malnutrition. Catley et al. (2007), contributing to a report on the impact assessment of livelihoods-based drought interventions in the Moyale and Dire Woredas areas, agrees with this statement when it was stated that “recurrent drought is the key factor affecting the vulnerability of the pastoralists”.

Heffernan (2004), further referred to poverty as a pronounced deprivation of well-being. The literature moreover justifies this by stating “to be poor is to be hungry, to lack shelter and clothing, to be sick and not cared for, to be illiterate and not schooled”. More than 1.3 billion people, representing one third of the population in the developing world, live below the poverty line (defined as an income of less than 1 US\$ per day).

The Turkana district is characterized by desert scrub, interspersed by arid grasslands and rich pastures on the hillsides, which provide excellent grazing for livestock. Livestock, its care and protection, indicates every aspect of the way of living of the Turkana people. The Turkana people thus depend on their herds, particularly goats, for their survival and the district is comprised of both arid and semi-arid land (ASAL) regions. The rainfall and distribution pattern in the district has always been unreliable and erratic over the years. The district also experiences

high and fairly uniform ambient temperatures throughout the year, with an average daily temperature ranging between 24 and 38°C (GOK, 2007).

## **2.2. DEFINITION OF KEY WORDS**

### **2.2.1 Household**

Heffernan et al. (2001), defined a household as comprising of family and non-family members. The family in this case is considered to be a distinct social unit. To the contrary Esenu et al. (2005) defined a household as 'family unit' or 'core unit'. To justify their definition, it is further described as a group of people who are mostly relatives sharing the same residence (homestead), activities and resources. The current study also gives the operational definition to include individuals who shared a residence, ate together, and shared livelihood resources and strategies, who may or may not have been related (Esenu et al., 2005).

Heffernan et al. (2001), stated a household as a residential unit - some of whose members are related by kinship, while others are not. A family is defined by kinship, marriage and parenthood, and could take on many different forms in different cultures. In the Turkana district, the *Awi* is a very small and independent social unit characterised by their freedom to move anywhere they find an environment fit for their livestock (Akabwai, 1992). A household could be comprised of a husband, wife, and/or co-wives, children, and other dependents such as elderly parents and orphans. Heffernan and Misturelli (2001) refer to the *Awi* group as the only viable social unit.

A pastoralist household is generally described as one where over 50% of the gross revenue is derived from livestock or where 15% or more of the total household energy consumed is derived from livestock products. A group of nomadic pastoral households are referred to as an *Adakar*. The *Adakar* group may move in secure groups, with a recognized leader in search of pasture and water. The recognized

leader may either be a *general, emuron (seer), generous man, ex-chief* or both an *emuron and general* (Akabwai 1992). Each *Adakar* group has its own "parliament". -*ekitoe a ngikiliok* (tree of men), where they conduct their meetings. Members of the *Adakar* meet daily under this "tree of men" (Heffernan, 2004)

Rass (2006) defined pastoralist households as households which obtain more than 50% of their total gross income (including the value of their own produce consumed within these household) from mobile livestock rearing on unimproved, communal pastures. These pastoral production systems in Kenya are normally developed in the arid regions, where climatic uncertainty, unreliability and the nature of the soils affect spatial, as well as the temporal variation in the vulnerability of the crucial natural resources. Livestock and the production system represent the main assets, while mobility patterns are the key strategies to cope with these changing conditions.

A compound is another form of social grouping and is composed of friends, relatives, and clan mates, living in a close proximity. Herding and migration decisions are made at a compound rather than at the household level, while livestock labour resources are also pooled (Heffernan, 2004).

### 2.2.2 Sustainable Livelihoods

In a study by Fratkin and Mearns (2003), the sustainability of pastoralists, was set at maintaining livestock productivity, defending their rights and access to water and grazing resources and ensuring political and economic security. The study further stated pastoralist's sustainability strategies to include herd flexibility, diversity and mobility to ensure the survival of the pastoralists and their livestock. These comments were supported by Degen (2006) who referred to sustainability as implying "the consideration of various dimensions e.g. environmental, economical, institutional, and social". However, Heffernan et al. (2001) specifically highlighted livestock ownership and husbandry as very essential for sustainability. It was also recognized that sustainability in pastoral production systems demands livestock mobility or movement according to the availability of natural pastures.

Abebe (2005) and Carney (1998) again defined sustainable livelihoods as the capabilities, assets (including both material and social resources) and activities required as a means of living. It was further emphasized that a livelihood is sustainable when it can cope with and recover from stress and adverse conditions, and maintain or enhance the capabilities of assets both current and in the future while not undermining the natural resources.

Documentation on the contribution of livestock development to poverty alleviation in the pastoral areas of the Horn of Africa vividly describes sustainable livelihood (SL) as an approach to improving pastoral livelihoods. It is reported that SL's should aim at increasing the acquisition of livestock and livestock products, protect and develop the livestock assets, as these are the key assets (Abebe, 2005). These definitions are also supported by Carney (1998), who defined sustainable livelihoods as, "capabilities, assets (including both material and social resources) and activities required for a means of living"

According to Davies (1996), livelihood adaptation, vulnerability and resilience are the abilities of a livelihood to be able to cope with and recover from financial stresses and shocks. This is central to the definition of sustainable livelihoods. Such resilience in the face of stresses and disasters is a key to both livelihood adaptation and coping. Those people who are unable to cope (temporary adjustments in the face of change) or adapt (longer term shifts in livelihood strategies) are inevitably vulnerable and unlikely to achieve sustainable livelihoods. Assessing resilience and the ability to positively adapt or successfully cope requires the analysis of a range of factors - including an evaluation of historical experiences of responses to various shocks and stresses. Different types of setbacks or stress, in turn, may result in different responses, including avoidance, repartitioning, resistance or tolerance mechanisms (Payne et al., 1994).

Well-being and capabilities – The notions of 'well-being' (Chambers 1995; 1997) and 'capability' (Sen, 1984; 1987) provide a wider definitional meaning to the livelihood concept. According to Sen (1984), capabilities are 'what people can do or be with their entitlements', a concept which encompasses far more than the material concerns of food intake or income. Such ideas represent more than the human capital which allows people to do things, but also the intrinsically valued

elements of 'capability' or 'well-being'. Chambers (1997) argued that such a well-being approach to poverty and livelihood analysis may allow people to define the criteria which are important to them. This may result in a range of sustainable livelihood outcome criteria, including diverse factors such as self-esteem, security, happiness, stress, vulnerability, power, exclusion, as well as more conventionally measured material concerns (Chambers, 1989).

### 2.2.3 Livelihood Outcomes

Livelihood outcomes can be defined as what household members achieve through their livelihood strategies. These include levels of food security, income security, health, well-being, asset accumulation and status in the community (Koczberski et al., 2001). Unsuccessful outcomes on the other hand include food and income insecurity, high vulnerability to financial shocks, loss of assets and impoverishment. The sustainable livelihoods approach is thus about supporting people to achieve their own livelihood goals (with the proviso of sustainability). Livelihoods should therefore be judged on whether they contribute to the achievement of these livelihood outcomes that people consider important. One way of ensuring this is to negotiate indicators with particular groups and to draw these groups into monitoring processes (Davies, 1996). Care should also be taken to observe unplanned changes associated with developmental activities (e.g. changes in social relations, the accumulation or loss of assets by particular groups, etc.) (Chambers, 1989).

It is therefore worth noting that improvements in livestock production have the potential to generate more income. This in the end will increase the social well-being, reduce the vulnerability, improve food security and encourage more sustainable use of the natural resources.

### 2.2.4 Livelihood Activities and Livelihood Strategies

According to Chambers (1992), a livelihood is comprised of the capabilities, assets (stores, resources, claims and access) and activities required for living. A livelihood which is sustainable can cope with and recover from stress and setbacks, maintain or enhance its capabilities and assets, and provide sustainable livelihood

opportunities for the next generation. This then contributes net benefits to other livelihoods at the local and global levels, in the short and long term.

Pastoralists apart from livestock keeping, pursue a range of other household activities ranging from livestock marketing, petty trade, selling water, firewood, charcoal etc. The Turkana pastoralists also rely on the collection of edible wild fruits to supplement the livestock products. In pastoral communities, individuals and families who are unable to survive on livestock husbandry alone, move out of their settlements to become agriculturalists, fishermen, wage earners, or the recipients of famine relief. The literature considers livestock farming to be the major contributor to most household incomes (Heffernan et al., 2001). Grant (2000) stated that there is no agreed all-embracing definition for strategy as such, and describes it as an elusive and somewhat abstract concept. It is argued that the term strategy applies only when dealing with an area that is constantly developing. A strategy is thus the direction and scope of an organization or a unit over the long term. Strategies are systematic choices regarding how to deploy the resources to achieve specific goals (Grant, 2000).

Livelihood strategies are “the range and combination of activities and choices that people make in order to achieve their livelihood goals”. These strategies include short-term considerations such as the means of earning a living, coping with setbacks and managing risk, as well as longer-term aspirations aimed at providing to children’s future and old age (Carney, 1998).

#### 2.2.5 Income and Income Indicators

Pastoral households prefer to sell animals near the end of the rainy season, when animals are in the best body condition and fetch the highest prices. Sales at other times during the year are generally done to meet financial emergencies. Goats as such are seen as more liquid assets (easier to convert) than e.g. cattle and goat sales have a strong relationship with the demand for school fees and other household expenditures (Heffernan et al., 2001).

It has been pointed out in the study that in Kenya the income for poor livestock-keepers is highly seasonal. This is firstly because, livestock related livelihoods such

as livestock marketing and trading mainly occur during the rainy season. Secondly, the rains are the periods when most of the households will sell their animals to generate income to cover expenses for the duration of the year. Lastly, most small stock sales occur in October, which coincides with the period prior to the short rains, hence a time of low food production in both the crop-livestock and pastoralist systems.

The ALRMP (arid lands resource management project) monthly bulletins in the Turkana district have high-lightrd some environmental and livelihood indicators which are worth noting (Kapolon, 2007).

*Table 1 : Environment and livelihood monitoring indicators*

<b>Criteria</b>	<b>Description</b>
NORMAL	Environmental, economical and welfare indicators show no unusual fluctuation, but remain within the expected seasonal ranges
ALERT	Environmental and economical stress indicators start to fluctuate outside the expected seasonal ranges, within certain localized areas. Low asset status is observed within the district, as a result of losses in livestock and livestock produce
ALARM	Environmental and economical stress indicators fluctuate outside the expected seasonal ranges within most parts of the district. Population welfare indicators fluctuate outside expected seasonal ranges. Displacement of the human population as a result of the above is starting to occur
EMERGENCY	The environment and people are in a state of emergency. Large groups of people have become displaced due to the total collapse of the production system. Welfare indicators also show absolute minimum values

Source: (Muturi et al., 2000; Kapolon, 2007)

The bulletins further reported that the indicators changed from normal (1998) and have oscillated between the alert and alarm situations (except for 1992-2006), when the situation deteriorated to a stage of emergency. At this time, droughts were recurrent.

### 2.2.6 Vulnerability and Coping Mechanisms

While studying climatic variation and the impact on the East African livestock herds, Kathleen *et al.* (2004) defined vulnerability as the likelihood that an individual or group will be exposed to and adversely affected by. The study further stated that vulnerability is a characteristic of individuals or groups in terms of their capacity to anticipate, cope with, resist and recover from the impacts of environmental change. Communities which face similar risks, may not be equally vulnerable. This is because the human population can become vulnerable due to various reasons e.g. the environment (floods or droughts), changes in the distribution of human and wildlife populations, climate change, disease, changes in environmental and social policy, etc. The impacts of these changes are not felt equally throughout a community or region.

Poor people usually become more vulnerable and affected by adverse events beyond their control. In spite of this, the Turkana people try to develop strategies to cope with the elements inherent to the ASAL environments. The Turkana pastoralists have done this through a number of ways.

i. **Herd dispersion.**

Stock owners separate their herds and have them herded into regions, sometimes up to several hundred kilometers apart. This is intended to be a preventative measure against forage shortages and livestock theft. The members of the family then manage the different herds. The family reunites either during the rainy season or during certain ritual occasions. In other words, this strategy may also act as a risk mitigation strategy to disease and environmental stressors, and thus minimizes competition. Individual animals or groups of animals may also be borrowed to other stockowners who are either needy or in some way entitled to compensatory claims (Russum, 2002).

ii. **Labour distribution and allocation of roles and responsibilities.**

Livestock management requires a substantial amount of labour. This approach entails the segregation of herds according to age and sex. This allocation of roles and responsibilities is mainly made by the elders - mostly

men. The female members of the Turkana pastoral family are delegated the role of constructing the livestock shelter, milking and watering of the livestock, preparing food for the entire household, chores around the homestead and to take care of the young animals left behind. The harder tasks involving long distance herding and protecting the communal grazing lands and livestock from theft are undertaken by the men (both young and old) (Kapolon, 2007).

iii. **Mobility of herds and households.**

Mobility or the movement of herds is dictated by the availability of forage or natural grazing and water. This mobility is employed as an effective strategy to utilize the vast rangelands. This strategy is carried out consistently to respond to variations in rangeland conditions, water availability and insecurity (Russum, 2002; Kapolon, 2007). Pastoralists also allow a seasonal grazing pattern that ensures that livestock herds have access to forage and water throughout the year. Areas are also set aside as grazing reserves to be used during the dry season.

iv. **Social networks.**

This aspect refers to a viable network between kin and friends. According to Aemun (2006), livestock can be borrowed for herd-building (increasing numbers) or merely donated in expectation of favours from those within the social network. This form of kinship is generally aimed at maintaining constant ties with relatives and friends both in good and bad agricultural years.

v. **Herd management.**

This input includes the various ways of obtaining the maximum output out of the scarce resources e.g. by dividing the herds into smaller, flexible, easier to handle groups. One of the outcomes is food and income diversification which entails the consumption of livestock products, the gathering and processing of edible wild fruits for use during periods of food scarcity and the exchange or selling of livestock to purchase grains from agro-pastoralists or neighboring communities (Kapolon, 2007). The pastoralists may also subdivide the animals into lactating and dry herds, during the dry season.

The latter (animals) wander far out in the range lands, while the former are left behind near the major homestead to be utilized for domestic purposes.

vi. **Destocking.**

This term refers to an intentional removal of animals from herders and the land in times of drought and other calamities before the animals die or become worthless. These interventions also provide a fair price to the pastoralists/agro-pastoralists for their livestock, depending on the animal gender and age (Cullis et al., 2007). In his report on the constraints and coping strategies and viability in Eritrea, Russum (2002), supports the practice of de-stocking as a way of giving pastoralists the cash they need to buy food, maintain a core herd, conserve the vegetation and give access the services they require.

vii. **Food aid.**

Food distribution aid during periods of drought improves the pastoralists' terms of trade by causing grain prices to decline and prices of livestock to increase. It also provides the incentive for the pastoralists to keep animals and thereby contribute to the livelihood recovery process after a disaster. However, indiscriminate distribution of food aid also contributes to a shortage in labour. Relief inputs and especially food distribution creates a serious dependency syndrome and hand-out mentality in the poor rural communities. Further, by providing live-saving humanitarian assistance to pastoralist communities, food aid can even permanently disrupt the migration routes (Kapolon, 2007)

## **2.3. PASTORALISM**

It has been reported that approximately 25% of the earth's land surface supports about 20 million pastoral households or approximately 180 to 200 million people. Of the African population, pastoralists account for 12 to 16% (Degen, 2006; Omosa, 2005). East Africa has the largest variety and number of pastoral societies recorded and occupy 70% of Kenya and 50% of Ethiopia, Somalia, Sudan, Tanzania and Uganda (Omosa, 2005). In spite of this occurrence, pastoralists are minorities and lead different ways of life in terms of culture, values and languages. The

governments in these countries have continued to underestimate pastoralism, and have promoted policies that seek to change or replace this way of life. The neglect of pastoralism by governments also carries the huge potential burden of poverty. Environmental degradation and conflict is likely to increase as the local rural people lose their livelihood base and struggle to survive (Omosa, 2005; Degen, 2006; Hesse and Mc Gregor, 2006).

Degen (2006), stated that 60 to 65% of the dietary energy intake of the Maasai, Turkana and Rendille pastoralists originates from milk - the dietary calorie intake generally being low among the pastoralists. This finding is supported by Russum (2002), who reported that the Turkana pastoralists, who practice some form of agriculture may supplement their pastoral diet with wild plants, game, fish, grains and other food commodities purchased through the sale or trade of livestock (mainly small stock), market products, wool fibres, hides, etc. In this case, they augment their livelihood by diversifying into other economical activities.

According to Morton (2006), pastoralism can be defined as a production strategy in which people raise animals as a means of earning a livelihood. This often occurs in the ASAL areas. The strategy has been described as subsistence and is aimed at providing a regular supply of food in the form of milk, meat and blood. The system further relies for a substantial part of its outputs on livestock. A definite prerequisite for a system to qualify as pastoral is that it must involve some degree of mobility or movement of animals. The common feature of all pastoral groups is the use of communal grazing land and their mobility, which allows them to respond to variations in rangeland conditions, water availability and insecurity.

Hesse and Mc Gregor (2006) and Fratkin and Mearns (2003) claimed that pastoralism is more than a livestock-based production system and is not, as such, a traditional form of ranching. Further it is a livelihood system that integrates livestock husbandry, in combination with other activities, as a rational economic activity with strong social, environmental and cultural objectives (Fratkin and Mearns, 2003) This however contradicts with Russum (2002), who paints a different picture by stating that pastoralism denotes economies that derive the bulk of their food supply from livestock, using a greater variety of herding or production practices on the natural resources.

Studying the role of livestock in sustainable local development and poverty alleviation, VSF-B (2005) describes pastoralists as people who are highly dependent on livestock for their economic and social well being rather than relying on crops or other sources of income. This view has been supported by Degen (2006) who depicts pastoralists as people who often shepherd more than one specie of livestock.

### 2.3.1. Kenyan Pastoralists

According to Mapenyi et al. (2003), pastoralists are livestock herders found throughout Africa's arid regions, where they constitute between 12 and 16% of the total population. They are people, whose livelihood depends mainly on the raising of domestic animals, including cattle, camels, goats, sheep, donkeys for milk, wool, meat, hides, transport and trade. The Pastoralists trade or barter in livestock, hides and skins, and milk for other food commodities or cash income to purchase grains, pay for family education, health care and other services (Abebe, 2005; Hesse and Mc Gregor, 2006; Morton, 2006). Similarly, pastoralists live mainly on the milk and milk products of their livestock, supplemented by cereals, mainly sorghum and millet

Most pastoralists live in arid to semi-arid environments, and most production systems are focused on ruminants (camels, cattle, sheep and goats) and equines (Hooft and Wanyama, 2005). They occupy the semi-arid or arid areas of the country, characterized by low and erratic rainfall, resulting in marked spatial and temporal variations in grazing resources (Abebe, 2005; VSF-B, 2005). The frequency of movement by pastoralists is determined by a number of factors including drought, insecurity, size of the households, alternative sources of income and the size of livestock herds (Omosa, 2005).

### 2.3.2 Classification of the Pastoralism System

Several literature reviews have classified pastoralism into three categories viz nomadic, transhumance and agro-pastoralism. Nomadic pastoralists, is a category

of pastoralists, whose livelihood is based on livestock and their products. These animal products can be consumed, sold or bartered. The mobility of these pastoralists provided them with the flexibility of seasonal land use movement and livestock follow the seasonal variations in range production and insecurity (Aemun, 2006). These pastoralists usually cover great distances with their livestock, following pasture availability throughout the season. These nomadic pastoralists are generally strongly affiliated with one another. Nomadic pastoralism has been said to be the most effective in utilizing the arid lands of the world, because of their adaptation to the problems relating to recurrent droughts (Aemun, 2006; Juma et al., 2007)

Transhumance pastoralism entails the regular seasonal movement between set areas. Movement could be vertical, as is typical in the mountains, where pastures at high altitudes are used in summer and pastures in the lowlands are used in the winter. The patterns of migration are more or less pre-determined under normal circumstances (Russum, 2002; Degen, 2006).

Agro-pastoralism on the other hand has agriculture as the main subsistence activity, but where animal husbandry is an integral part of the household economy. This system has been described as “settled pastoralists”, who cultivate sufficient areas to feed their families from their own production. Agro-pastoralist hold land rights, use their own or hired labor to cultivate the land and grow staples. Their herds are on average smaller in size than other pastoral systems, possibly because they no longer rely on livestock and depend on specific grazing around their own villages, which can be reached within a day (Russum, 2002; Degen, 2006).

## **2.4. LIVESTOCK**

Nearly 2 billion people, 30% of the world’s population, derive at least some of their livelihood from livestock. Nearly one person in every 8 is totally dependent on livestock in Kenya and domestic farm animals meet more than 30% of people’s food and agriculture needs (ILRI, 2000). In Kenya, the livestock population is estimated at 12.9m cattle, 17.9m small stock (goats and sheep), 0.9 camels and 0.9 donkeys while the livestock sub-sector in Kenya accounts for 30% of the agricultural commodities (Njanja et al., 2003).

It would also seem as if the Turkana pastoralists have developed a special relationship with their livestock (Omosa, 2005). In Turkana, a person without livestock is considered as being lost, having no social status, power and not able to support a family. Livestock kept by the Turkana pastoralists consists of cattle, sheep, goats, camels, donkeys and poultry. The Turkana pastoralists then largely depend on these livestock and livestock products for their livelihood. In addition to providing the basic food requirements, livestock are also used as draught animals and as a means of transport, and earnings are also generated through the sales of animals or in the form of selling their hides and skins (Russum, 2002).

#### 2.4.1. Livestock Products

Over the next 20 years, there should be a drastic increase in the demand for food of animal origin, with virtually all the increased demand coming from the developing countries. In global terms, this means that by 2020, people in the developing countries (who comprise 75% of the world population) will consume 60% of the global milk and meat production (Stroebe, 2004).

The magnitude and significance of the projected increases in the demand for livestock products in the developing countries over the next 20 years, has been coined the 'Livestock Revolution' (Delgado et al., 1999; Stroebe, 2004). In the developing countries, an increase in wealth may be associated with increased protein consumption, meaning that livestock production is becoming more industrial, cereal-based, monogastric focused, humid/warm eco-regions centred, and focused on urban proximity. Increased production of meat or animal protein in sub-Saharan Africa will continue to come primarily from cattle, sheep and goats (Stroebe, 2004)

The role of livestock can thus be described in the various ways it contributes to the poor household asset base. In addition to providing food for the household, livestock forms a key source of cash, paying for school fees, medical costs, and as a means of buying other non-pastoral, consumer items. To these poor households it is the only form of asset accumulation and risk diversification (VSF-B, 2005). Meat is generally the main product of livestock rearing, with other products being eggs,

milk, fur, hides, dung and feathers. Livestock also provide an emotional relationship and perform a social function (Russum, 2002).

**Table 2: Summary of benefits and products derived from livestock (Stroebe, 2004)**

Food	Milk; meat; eggs; blood; fish; honey, processed products
Clothing	Wool; hides; skins; leather
Work	Draft power cultivation; transport of goods and people; threshing; milling; pumping water
Monetary	Capital wealth; investment; savings accounts; income from hiring animals; sale of products; sale of animals
Social	Lobola (bride wealth); ceremonial; companionship; recreational; status
Manure	Fertiliser (soil amendment); fuel; flooring
Other benefits	Feathers; bone meal; soap production

#### **2.4.2 Livestock Policy**

In Kenya, the last livestock development policy was formulated in 1980 and this emphasized increased production to help make the country self-sufficient in terms of livestock products (Stroebe, 2004). Since then, many livestock policy issues have been addressed in various other policy documents. Some of these policy documents include the National Agricultural Research (NARP I) and NARP II. It is clear that none of these policies clearly address goat production as such.

The priority and aim of Kenya in terms of livestock production is to produce enough food for national self-sufficiency in terms of meat. This has been the case since Kenya achieved its independence in 1993 and continues to be so today. To achieve this, the development of the livestock sector and in particular of the dairy sub-sector, depends heavily on the availability of high quality genetic material. It is believed that such animal genetic resources are essential for the establishment and the growth of a national herd with high productive potential (Mbuku, 2006).

Khalid and Quintana (2001) clearly stated that Kenya's national livestock development policy had not yet been formally formulated. However, it is worth noting that livestock development is under increasing pressure to address the rapidly changing needs and demands of both the rural poor and the expanding global population.

### **2.4.3 Importance of Livestock**

Livestock is an important capital asset which, with careful tending, can propel households out of abject poverty, into market economies as animals are an important source of income, generating cash from the sale of products, animals or the hiring of livestock (Sikosana et al., 2006). Further more livestock are one of the few assets available to women and to the poor and can be both accumulated and sold in times of crisis (Fuller, 2003). They remain a key source of collateral for the poor and enable many households to obtain access to capital and business loans. In the unstable currency markets, investment in livestock lends stability to the family economy, though investment in a commodity that has less risk of depreciating in value. Thereby providing assets for sale at realistic prices during times of need (Heffernan, 2004; VSF-B, 2005).

According to Fuller (2003), livestock can be a way of managing and diversifying risk and therefore increasing livelihood security, and this can make the difference between survival and abject poverty. This is supported by VSF-B (2005), who state that livestock contribute to food security beyond caloric goals. The ownership of livestock allows producers to maintain a diversity of assets that decreases nutritional vulnerability during times of shortages. Livestock products are healthy sources of protein, calcium and iron, all of which are likely to be in short supply to people in the developing countries (Stroebe, 2004).

In pastoral communities, livestock is associated with wealth and status. Wealth being measured in the kind and number of domestic animals a household possesses. Animals also have a cultural part in marriage dowry. So for example the value of a daughter is determined by how many cattle are being paid. Livestock can also be used as gifts, loans and tributes, provide raw materials (wool, hair hide and

skins, bones), clothing, furnishings, tools, etc), animal traction, manure and fuel. Manure also has properties that can be used as fuel and for construction purposes (walls and floors) (Heffernan et al., 2001; Khalid and Quintana, 2001).

Given the fact that malnutrition affects many pregnant women and almost 30% of all children younger than 5 years, livestock production plays a critical role in providing balanced diets and adequate levels of nutrients, especially in the poor communities (Stroebe, 2004). The writer further reports that the keeping of livestock also protects households from sudden shocks or disasters such as civil war and political instability. According to Sikosana et al. (2004), livestock could enhance the well-being and decrease a household's vulnerability to times of shortages and disasters.

Livestock are a means of subsistence and prestige goods that enable individuals to establish social relationships with other members of the community. At the same time, the animals enable individuals or cultures to establish and achieve mystic, but not irrational linkage with the supernatural. During difficult times, animals can be given to neighbours or relatives to tend. Relatives then get the benefit of the animals' production while the other household saves on feed and fodder resources. Livestock remain a form of insurance, as they provide social links through bride price, inheritance and as ritual objects (Omosa, 2005).

#### **2.4.4 Livestock Production and Climate Change**

ASAL cover 80% of total land surface area of Kenya, and provides a subsistence income to 25% of the population, comprised mainly of pastoralists and agro-pastoralists (Njanja et al., 2003). The East Africa rainfall is generally bimodal, but is characterized by uncertainty, both spatially and temporarily. The rainfall is more scatterly distributed in the arid than the other climatic environments, and adequate rainfall from year to year cannot be bargained on for a given location. Pry and McCabe (1986) stated the East African precipitation to be sporadic and scattered, resulting in a variation of vegetational growth, the pattern of which changes annually. After the brief rainy period, the land in Turkana becomes increasingly arid described as 'the dry season' and vegetation becomes scarcer and water resources

more scattered-until almost drought-like conditions exist by the end of the year cycle. The literature further describes the environment as harsh and unpredictable, with high ambient temperatures and an unreliable 2 to 3 months 'wet season', when the precipitation is most likely. Kathleen *et al.* (2004) also attested the climatic impact on the households and it was observed that as the livestock numbers per household decrease slightly, milk yields was less, and in the drought years, there is no home-produced maize so more money had to be spent on the buying of grain.

The consequences of climatic change can be summarized as follows:

- a. **Migration.** Many pastoralists move long distances with their livestock. They move to places where the host communities are accommodative and where there are abundant pastures and less animal diseases.
- b. **Conflict.** As climate changes intensify, people move further from their traditional grazing routes, to other people's pastures. As the situation worsens, pastoralists move longer distances in search of pasture and water and in the process, they may meet hostile tribes. The Turkana people thus often clash with neighboring tribes and compete for natural resources .
- c. **Settlement in villages and camps.** More and more nomads have become sedentary or more stagnant. The number of villages have increased and sprung up along the public roads. Hungry families shelter or squatter in crude camps on the outskirts of most towns, hoping for handouts of food. Unless a concerted effort is made to create alternative means of making a living, these unwanted camps with their inhabitants will continue to mushroom.
- d. **Deforestation.** More and more pastoralists are chopping down trees and destroying the forests to sell as charcoal, firewood and building materials. This further degrades the environment and increases desertification. The vegetation is becoming so sparse in certain areas that it takes a 3 day round trip to gather firewood to sell to the town dwellers.
- e. **Aid dependency.** The number of dependants relying on food aid in Kenya keeps on increasing daily. This is because most pastoralists have lost their

animals and thus their livelihood. Clearly, this situation of aid dependency is not sustainable.

Pastoralists in Turkana usually operate under comparatively harsh environmental conditions, which are beyond their managerial control (Quinn et al., 2003). Thus the livestock population depends on the process of natural selection to a larger extent, than for other animal production systems in more favorable environments. Natural selection implies those animals unable to cope with the environmental conditions (stress, disease challenge, drought, etc), which do not adapt or die and hence do not produce. If the process of natural selection leaves more animals lagging behind than are necessary to satisfy the household's need, pastoralists can start applying their own selection – via artificial selection to actively improve the occurrence or frequency of certain desired animal features or traits in their herds (Mbuku, 2006).

#### **2.4.5 Livestock Grazing**

Marginal areas are endowed with indigenous natural feed resources. The ownership of trees (*Acacia tortilis*) ensure that the livestock have access to pods during the dry season. These are an important nutritional source, especially for goat rearing in the areas of Turkana. Indigenous Fodder Trees (IFT'S) are important for the dry season feeding of goats and can contribute significantly to sustainable goat production by providing fodder of high nutritive value. IFT'S are rich in both energy and protein-the nutrients that are lacking in most low quality feeds. These Acacia trees also have certain medicinal properties, and hence provide affordable and readily available remedies for certain goat diseases and conditions (Els and Ramsay, 1992; Ahuya et al., 2006)

Indigenous fodder trees produce a considerable amount of protein biomass during the dry season, and are highly adapted to the local Turkana environmental conditions. These attributes make IFTS important feed resources for especially the goat keepers. Milk production of goats and cows depend on the forage and water availability and consequently, is low during the dry season and higher during the wet season (Els and Ramsay, 1992; Omosa, 2005; Degen, 2006)

In Turkana, the ability to access, control or make use of natural resources e.g. water or pastures are defined by rules and social norms. With such routines in place, the pastoralists value the resources and use it sustainably and access is clearly understood to be part of a reciprocal agreement. The digging, use and maintenance of wells e.g. are governed by an elaborate system of customary rules. According to Omosa (2005), conflicts arise when there are no proper governance systems. In that case, people will use unorthodox means to get access to water and pastures for their livestock. Traditionally, each household has a section of trees along seasonal streams (*Ekwar*) which served as a fodder bank reserve during periods of drought.

#### **2.4.6 Gender Roles in Livestock Production in Turkana**

Gender in this context generally refers to the socially defined roles of men and women in each culture. Recent statistics reveal that worldwide, an estimated 70% of the rural poor are women for whom livestock plays an important role in maintaining the status and often represent the most valuable asset and provide the most important source of income (Stroebe, 2004). In the Turkana district women participated in all the livestock management activities and were mainly involved in tethering, kraal cleaning and watering of the animals (Oluka et al., 2004)

Research on livestock and differentiated rural livelihood systems in Northern Pakistan, have shown women and children to be the ones involved in working with the animals (Khalid and Quintana, 2001). The work generally involves taking the animals to pastures, milking and the making of dairy products. If the herd is large, men are also involved in milking. These findings are supported by Degen (2006), who found women to be responsible for milking of the ewes and the processing of milk products.

According to Stroebe (2004), men are responsible for activities regarding the more strategic decisions e.g. herd composition, production management and slaughter sales. In the Turkana district men make the decisions regarding e.g. goat keeping, after consultation with their wives. Men are also responsible for the buying and

selling of the animals, moving the animals to the grazing, and providing the livestock with feed and water. Women are responsible for milking and the processing of milk and taking care of the young and sick animals near to home. Gender bias, against women in Kenya generally exists in the ownership of stock. Thus generally, the ownership of stock is male dominated.

#### **2.4.7 The Roles of the Kenyan Government and NGO's in Livestock Production**

Stroebel (2004) pointed out some of the reasons for the poor performance of livestock production systems. These include inappropriate policies, institutions not responsive to the needs of the smallholder producers, limited resources, a failure to develop appropriate technologies for smallholder producers, limited access to markets and limited management experience and applied knowledge.

Information and research shortcomings related to livestock production e.g. the lack of capacity, marketing issues and policy constraints relating to the limitations, are some of the constraints relating to the unsatisfactory progress of livestock development in the PRSP (Poverty Reduction Strategy Paper) (Abebe, 2005). These livestock practitioners provide interventions and research and the organizations can advocate research initiatives that are pro-poor and reduce the risks of animal production. The practitioners (professionals such as veterinarians) need to spend more time evaluating these needs, developing creative intervention approaches, and honestly assessing impacts in order to improve the efficiency of animal production (Hooft and Wanyama, 2005).

In the developing countries, consumers have become more affluent and the demand for meat and milk has further led to increased consumption levels. There are currently increased consumer demands for livestock production products, with subsequent changes in the livestock industry to increase. Catley et al., (2007) argued that there is need to recognize the importance of pre-existing services and marketing ways of these products.

Pastoralists have never been represented on governmental or higher level in decision making processes affecting their lives in general. Oluka et al., (2004) stated that, NGO's should be more effective and gender balanced in offering extension, education, other services, credit and savings facilities, at reasonable interest rates especially to the women involved in livestock production.

Severe droughts and clan tension resulting from the introduction of multi-political parties in Kenya in 1992, has put pressure on pastoralism as a source of livelihood. There is therefore the need for donors and NGO's to review innovative livelihood strategies in the pastoral areas.

## **2.5 SMALL RUMINANTS**

Fifty percent of the world's undernourished people are small stock holder farmers. These encompass 20% of the rural landless, 20% of the urban poor, and 10% pastoralists, fishermen or forest-dependents (Hooft and Wanyama, 2005). Various researchers have observed small stock to be perceived as easily disposable assets. Traditionally, small ruminants (sheep and goats) have been an important aspect in the subsistence household economy of the pastoral areas. This is especially true with respect to pastoral women, who are key role players in livestock production and management. Investment and small stock income act as a form of a 'current account' that can be cashed-in to meet the expenditure where the selling of a cow would not be appropriate (Heffernan et al., 2001; VSF-B, 2005).

All over Africa, rural people seem to associate goats with the payment of school fees or doctor's bills. Small livestock production enables the poor to earn income from animals grazing on communal pastures or supplemented with household waste. Meat from small stock producers account for 30% of the meat consumed in Africa. The resource poor have multiple and complex objectives with regard to keeping small stock e.g. nutrition investment and income, fibres and skins, manure and creating and maintaining social ties. The direct nutritional benefits of milk, meat, and eggs, in terms of protein, calcium, vitamin A and other micro-nutrients, are then also extremely important. These nutrients benefit physical health and development (Heffernan et al., 2001; Morton, 2006).

There are some stereotypes however, in keeping and farming small stock in Kenya. As previously mentioned, small ruminants are generally kept by the poor rural people, often tended by women, who seldom have a say in the enterprise. Small ruminants and people who farm them are held in low esteem and generally given few privileges in development. In some pastoral systems, sheep and goats are often referred to as the forgotten livestock (Heffernan et al., 2001)

### **2.5.1 GOAT REARING**

Coffey et al. (2004) reported the goat to be one of the first animals to be domesticated by humans, about 9000 years ago. Currently, worldwide there are some 200 different breeds of goats that produce a variety of products, including milk, meat and fiber. Of the 674 million goats in the world, 94% are then also found in the developing countries (Stroebel, 2004). In a study to increase the contribution that goats make to the livelihoods of the resource poor livestock keepers, Rymer (2005) reported that goats contribute approximately 30% to the goat-keeper's livelihood.

The population of goats in East Africa (EA) has been estimated to be 48 million. The majority of these are farmed by small scale, poor livestock farmers and in small flocks of less than 10 animals. Kenya as such has about 5 million goats, most of which are owned by the Turkana, Maasai, Boran and Pokot tribes. Although a greater potential for exploiting a variety of goat genotypes exists in Kenya, compared with the rest of Africa, the realization of this potential still remains elusive (Ahuya et al., 2005 ; Degen, 2006).

According to Yasmin et al. (2003), the goat industry has been realized to be one of the most important industries for meat production and alleviating poverty. Although the goat industry is indicated to be profitable, it is not improving due to the high rearing costs, lack of proper management, significant health care and marketing facilities. These goats primarily produce meat, but also produce milk and other by-products to the nutrition of the rural poor. Goat meat and milk has a high nutritive (protein) value. The prospects for increased goat productivity are based on efficient and sustainable exploitation of the goats. Inherent unique features such as

adaptability, the ability to thrive under harsh environments, resistance to diseases, etc should have the objective of increasing goat production in harmony with the carrying capacity of the natural pastures (Mamabolo and Webb, 2005).

#### **2.5.1.1. Reasons for keeping goats**

In their research on goats in semi-arid India, Jayaswal et al. (2004) found goats to be the main sources of milk and meat during the dry season and also fast breeders (short generation interval). Goats provide milk, meat, which are of high nutritive value and the increase in the goat population has been shown to be a response to the increased demand for meat and improved infrastructure development for better access in the rural areas. In East Africa, goat meat is used for roasting in most meals. This is popularly known as "*nyama choma*". (Mtenga et al., 2002)

Goats are much hardier than cattle, have less maintenance requirements and cost less to maintain per animal. Goats are relatively cheap to buy and also have a faster reproductive rate than larger herbivores. This allows goats to generate a quicker return on invested capital. Goats are an easily liquidated resource that can be used for saving/raising cash. In case of an economic crisis, at the household level, goats can easily be sold as they are affordable to many people. They serve as a 'bank account' which can be drawn upon when cash is needed- the goat kids can be seen as the interest on the investment. ( Smith et al., 2002; Joshi et al., 2003; Jansen and Van Den Burg 2004).

Goats adapt to a wide variety of climatic conditions and survive on browse material not normally utilized by other livestock and are more resistant to drought and adaptable to harsh environments. Goats also have the ability to survive on browse material during the dry, arid season (Smith et al., 2002; Joshi et al., 2003)

Goats are also used as gifts to strengthen relationships. So for example, goats can be offered as a present to a relative, visitors, or friend, or for thanking somebody in appreciation for his or her good deeds. These animals are also important for customary purposes (traditional rituals) or slaughtering for funerals and sales. When there is a surplus of males or old females, the sales are utilized for the

financial needs of the family. In ceremonies, parties and festive celebrations, goat meat is served because of its tenderness and good taste preferred, by most people to that of cattle. In some tribes, goats are slaughtered during certain traditional rituals or reconciliations following disputes (Mtenga et al., 2002; Mapenyi et al., 2003; Jansen and Van Den, 2004).

Goats provide both food and income to buy food (through the sale of surplus milk and milk products) and make a great contribution to the household monthly income, especially during the wet season. Goats are potentially available for sale all year round and in the absence of a viable milk market, they are a more reliable source of cash than cows. Goats also provide hides and skins, dowry (*lobola*), rituals and gifts.

The Turkana pastoralists also own goats as an insurance policy against drought. According to Stroebel (2004), the ownership of goats increases as land becomes scarcer. This confirms the view that poorer households obtain food and financial security from owning these smaller animals.

#### **2.5.1.2 Keeping of goats - the practice**

Goats are small ruminants (i.e they have a four compartment stomach designed to digest large quantities of forage). Goats tend to move in groups when grazing as they are familiar with each other. In the pastoral system, normally large numbers of animals are kept for fear of big losses in the event of unexpected hazards. Pastoralists raise kids for replacement of stock, to be sold as breeding stock, or slaughtered for meat. This therefore entails that the household must raise healthy and productive kids (Mapenyi et al., 2003; Coffey et al., 2004).

The female goat (doe) is capable of caring for her new born kids and if the birth happens without difficulty, then the kids can already start grazing with the herd the day after birth. Does are also able to tend their new born kids until they are sexually mature. According to Jansen and Van Den Burg (2004), the better the care, the greater the production or growth of the animals and these animals will be able to reach maturity earlier.

The main sources of feed for goats are the natural grasses, trees and shrubs in the rangelands. This rangeland utilization is characterized by communal land ownership. In his study on Acacia and other tree pods as supplements, Sikosana et al (2006), found that the pods of the Acacia ripen during the dry season and can be used to supplement the livestock when there is an inadequate supply of feed on the rangelands.

It is good to ensure that the animals are in a good body condition and thus adequate nutrition, protection and timely treatment of diseases and parasites are very essential. There is also the need to ensure the availability of sufficient feed during gestation and the suckling periods (strategic feeding).

For a community like Turkana to be successful, all have to have an integrated approach aimed at production efficiency, economic viability and social responsibility. Goat productivity may be increased by the introduction of new breeds with different traits, (Ahuya et al., 2005). One route to introduce new genetic material is then by cross breeding these new breeds with the local goats. Cross breeding has been the most common strategy for dairy goat improvement, and has been carried out in the EA region for some time with many exotic, temperate and local breeds being involved. Various agencies have been involved in setting up of sustainable community-based goat improvement schemes and further improvement can be done through institutional support which starts with the formation of farmer groups (Ahuya et al., 2005).

### **2.5.1.3 Advantages of goats compared to other livestock**

Goats have a higher reproductive rate than cattle, and because of their shorter generation interval, it is possible to have a quicker return on invested capital. Likewise, the rate of genetic improvement is also potentially greater. According to Ahuya et al. (2005), the goats' short productive cycle and the high incidence of multiple births are advantageous in most situations. Good reproduction is the capacity of a group of females to produce many young in a year. As stated by Jansen and Van Den Burg (2004), goats can have up to 3 litters in 2 years, with

one litter per year being the norm. It has also reported that the more kids mature, the more goats can be sold, slaughtered or given away. As goats are more fertile and being a smaller capital expenditure, a loss through disease or poor nutrition is easier to handle than a loss in large livestock. Goats are generally quick maturing, with a high fertility.

Ahuya et al. (2005) observed that goats recorded higher survival rates than cattle under adverse drought conditions and are also able to adapt to a wide variety of climatic conditions due to their ability to survive on drought resistant trees and shrubs. Goats thus use water and low quality feed resources more efficiently than the other ruminants and due to their feeding behavior, goats are often less in competition with other ruminant species. Goats prefer browsing (eating woody plants), but will also graze grasses and weeds. Goats are known to stand on their hind legs in order to reach leaves and branches. In places where nagana (sleeping sickness) is prevalent, goats can still be kept, where cattle will not survive (Jansen and Van Den Burg, 2004).

The goat is a small animal and compared to larger animals such as cows, its money value is not high. This means, keeping goats is not too financial risky. Practically all sheep and goat milk is consumed by the pastoralists, and non-pastoralists rarely consume this type of milk, except for medicinal purposes.

With the goat's small body size and early maturity, it makes the goat especially suitable for the use on small farms - as a first step towards wealth creation. Due to their small size, they are also easily handled, moved and cared for by women and children - even small children can control the goats. Goats also have a longer lactation period than sheep (300 compared to 250 days), but sheep milk again has a higher fat and total solids contents than goat milk (Jansen and Van Den Burg, 2004).

#### **2.5.1.4 Goat breeds**

Ahuya et al. (2005) reported that Kenya has two indigenous goat breeds, namely the East African (found predominantly south of the equator) and the Galla breed

(which occurs mainly in the northern regions). It is further stated that exotic dairy meat goats were imported into Kenya starting in the 1950's, and more rigorously in the 1970's and early 1980's. The ministry of Livestock and Fishery Development in Kenya estimate the two goat breeds to make up 10 million head. Currently, the majority of the exotic goat breeds in Kenya are the German (Kenyan) Alpine, the Toggenburg, Anglo-Nubian, Saanen and Boer goats. The national population of exotic goats and their crosses are estimated to be approximately 100000 (Jansen and Van Den Burg, 2004).

## **2.5.2 CHALLENGES IN GOAT REARING**

Goat keeping constraints vary considerably from village to village, from one production system to another, and between men and women and different socio-economic groups. Major and common general constraints to livestock production listed in the literature are summarized below:

### **2.5.2.1 Drought**

Droughts have become more severe and it is only becoming more and more difficult to survive. With deforestation, the climate has become changed, worsening soil erosion and desertification. The winds for example create dust storms that can potentially increase the incidence of deadly diseases such as meningitis. Other effects that have been observed include: an increase in the distance to drinkable water, especially during the dry season, the gradual reduction of grass and tree crops and the formation of localized deserts, in places threatening to engulf villages. The period during which the rainfall prevails has become shorter and the dry spells longer, changing the pattern of the seasons on which the pastoral communities depend.

The Turkana district has often experienced droughts, but evidence collated, shows that the severity of these droughts have increased significantly. Most herders have been forced to abandon their pastoral way of life because of these adverse climatic conditions. In most areas, the pastoralists in Turkana also have to face new problems of animal health, linked to the sedentary conditions such as a lack of

pasture, the presence of litter, hygiene of animal shelters, change in husbandry practices, etc.

#### **2.5.2.2 Insecurity (conflict and Raids)**

Pastoralists suffer from chronic insecurity, provoked by cattle raiding and the competition for access to water and grazing. These conflicts have originated as a result of small arms proliferation, weakened/undermined traditional governance systems, the inappropriate development policies pursued by the Kenyan government and inappropriate land tenure policies. Conflicts and insecurity disrupt the pastoralist movement and access to grazing and water resources and also inhibit the access to markets for sale of livestock and livestock products, as well as for purchasing livestock supplies.

According to Lukhele and Ramsay (2002), conflicts have also reduced the number of livestock being farmed because of raids. These conflicts reduce the access to food, interrupt education, health care services and trade. Literature indicates physical insecurity to bar people from moving freely to and from market places to buy and sell foodstuffs and participate in other income generating activities. Hesse and Mc Gregor (2006) reported insecurity and fear to affect the levels of food production at household level due to a reduction in the quality and quantity of livestock. This reduction ultimately leads to hunger and increased poverty. Access to grazing areas in the dry season is often difficult as these areas are normally situated along common borders with the competing communities.

These conflicts then lead to loss of life and property, also lack of water and the degeneration of social relationships, and forced migration of families and livestock. It could also lead to the closure of boreholes (Lukhele and Ramsay, 2002).

#### **2.5.2.3 Disease**

Some of the signs of a healthy animal according to Coffey et al. (2004) are a shiny coat, lively manner, easy movement (no limping, no swollen joints or misshapen udders), no abscesses, proper body conditioning (not too fat or excessively thin); firm, pelleted manure and well shaped udders and teats.

Kenyan pastoralists all face a high risk of animal diseases in the Turkana district, because of aspects such as the mobility of animals based on the livestock production systems – often posing a high risk for spreading diseases. Further, there is poor disease control due to the fact that pastoralists live in remote areas where the services and money for medicines are not available. Besides this, there is a poor capacity by local government to provide services, while poor pastoralists cannot afford those services. As a result, the pastoralists have less capacity to cope with animal diseases. This aspect threatens the entire household asset base (Coffey et al., 2004)

There are several diseases which affect goats:

- **Parasites.** These are especially the internal parasites. These are of major health concern in goats. Goats are susceptible to these endo- and ecto- parasites, with parasites rapidly becoming resistant to all of the available helminthics (dewormers).
- **Caprine arthritis-encephalitis (CAE).** This is most serious disease facing the goat industry. This is an incurable viral infection that causes arthritis, a hardened udder that produces no milk, and a general wasting away of the animal.
- **Abortion.** A goat can abort due to amongst others a deficiency in vitamin A, iodine, copper, parasites, certain drugs and poisonous plants. With abortions the offspring produced is limited and production restricted.
- **Foot rot.** This is a contagious disease caused by the combination of two different bacteria, one of which cannot survive outside the host for more than two weeks. The other bacteria are present in the environment. The infection is generally painful, and is characterized by limping and signs of pockets of pus on the hoof. There is a strong, foul odor associated with foot rot.
- **Caseous lymphadenitis (CL).** This disease infects animals through breaks in the skin, such as cuts or scrapes from shearing, barbed wire, thorny bushes, etc. and becomes localized in a regional lymph node - most commonly in or around the neck. The resulting abscess can be either external or internal and can affect the animal's productivity.
- **Contagious Ecthyma.** Also known as sore mouth or orifice, ecthyma is caused by a pox virus. The disease is characterized by blisters and scabs on the lips and

can spread to doe's udder by an infected nursing kid. It affects the animal's grazing habits and hence body weight gain.

- **Scrapie eradication.** This is a fatal, degenerative disease affecting the central nervous system.
- **Flies.** The wasps lay their eggs in fly pupae and the larvae kill the developing flies by feeding on them.
- **Peste des petits ruminants (PPR).** This is an infectious viral disease of ruminants including goats, sheep and cattle. The clinical signs of PPR include severe erosions in the mouth and lips, difficulty in breathing and diarrhea.

With the improved health of goats, pastoral households will have direct benefits through improved milk supply and other benefits. Livestock mortalities will also be drastically reduced, and the number of animals available for sale increased.

#### **2.5.2.4 Management and Policy issues**

According to Ahuya et al. (2005), poor management of goats lead to their vulnerability to predators and deaths caused by under nutrition due to lack of nutritional supplementation. Other management related issues such as inadequate husbandry, a lack of a clearly defined national research and development livestock policy, poor public policy on the environment, especially the administration of animal health policies and disease control also contribute to uncertainty in the goat industry.

Fry and McCabe (1986) when doing a comparison of two survey methods in the Turkana district found that restocking tends to be planned and implemented without an adequate understanding of the pastoral system. Projects are often based on the assumption that western ideas and behaviors for appropriate models for the pastoral situation are applicable to the Turkana pastoral system. Hence the local system is ignored.

#### **2.5.2.5 Marketing**

Khalid and Quintana (2001) reported that livestock products hardly reach the urban areas and export routes, where there is a growing demand. Lack of access to

livestock markets in Kenya reduces the market value of livestock and constrains the ability of pastoralists to convert livestock assets into cash and other physical assets. This is due to the remoteness, poor infrastructure, lack of contact with livestock traders, insecurity, banditry, high government taxes, high transport costs and unofficial fee requests at check points. These factors have hindered pastoralists' free access to markets. Occasional and sudden drops in the purchase price, without prior notification to pastoral communities have also been observed (Oluka et al., 2004).

# CHAPTER THREE

## 3. CONCEPTUAL FRAMEWORK

### 3.1 INTRODUCTION

The Sustainable Livelihood Approach (SLA), which has been promoted by the DFID (Department for International Development), Oxfam, UNDP (United Nations Development Programme) and Care was used as a conceptual framework in this study. It is utilized as a concept to improve the understanding of the livelihood strategies of the Turkana pastoralists. Heffernan et al. (2001), stated that the SLA offers an opportunity to improve poverty reduction efforts by making an inventory of the circumstances surrounding the poor, as they themselves view them, rather than jumping to conclusions and immediately proceeding to conduct isolated in-depth analyses of particular attributes. According to Kinaro (2008), the SLA takes cognizance of pertinent issues revolving around, capabilities and resilience of livelihoods and the natural resources upon which they are dependent. This concept, operationalized in the SLA and often presented and illustrated as the SLF (Sustainable Livelihood Framework). As defined by Ahuya et al. (2006) the SLA encompasses, the "capabilities, assets (including both material and social resources) and activities required for a means of living.

The SLA can incorporate a wide variety of livestock production systems and allows for the comparison of the vulnerability or sustainability of livestock based livelihoods. Livestock-keepers differ from those where livestock comprise only a small portion of their livelihood. Livestock in this case constituting cows, camels, donkeys, sheep and goat (Heffernan et al., 2001).

The SLF framework places people, particularly pastoralists, in the centre of a web of inter-related influences that affect how these people create a livelihood for themselves and their households. These people, also, have assets to which they have access to and can use and include natural resources, technologies, their skills,

knowledge and capacity, their health, access to education, sources of credit, or networks of social support. The extent of their access to these assets is strongly influenced by the vulnerability context, which takes account of trends (for example, economical, political and technological) and catastrophies (e.g. prices, production, employment opportunities, etc). Access is also influenced by the prevailing social, institutional and political environment, which affects the ways in which people relate and use their assets to achieve certain goals. These are their livelihood strategies (Kinaro, 2008).

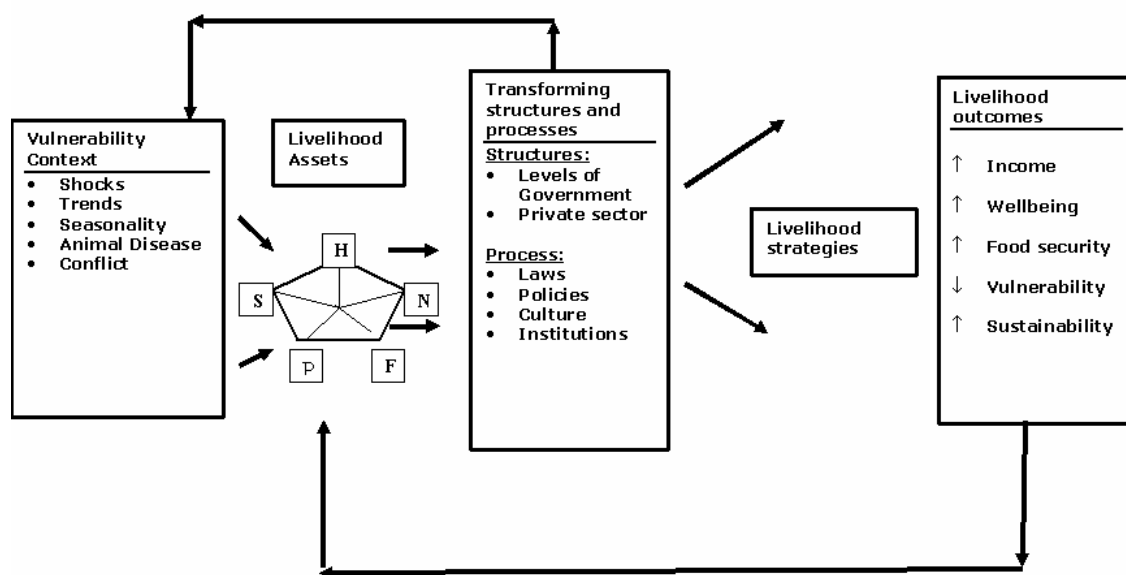


Figure 2: DFID's Sustainable Livelihood Framework (adapted from Carney, 1998; Heffernan et al., 2001).

## 3.2 DESCRIPTION

### 3.2.1 Vulnerability

Vulnerability in this context, takes into account trends (economical, political and technological), shocks or catastrophies (epidemics, natural disasters, civil strife, conflict, crime) and seasonality (prices, production, employment opportunities) or vagaries in climate change

### 3.2.2 Capital Assets

Households depend on 5 capital assets namely: - Human capital (**H**), Physical capital (**P**), Social capital (**S**), Financial capital (**F**) and Natural capital (**N**). According to Abebe (2005), other researchers have added Spiritual and Political capital. Thus for a sustainable livelihood, access to all these 5 types is required. The 5 capital assets have further been divided into two main groups, namely those that the household owns and possesses (private) and those of communal ownership. The contribution of goats to livelihood can thus be explored in terms of the 5 capital assets represented in the SLF (Sustainable Livelihood Framework) (Khalid and Quintana, 2001). The ability to pursue livelihood strategies is dependent on the basic material and social tangible and intangible assets that people possess, or the "capital" base from which different production forms of livelihoods are constructed. These include (Carney, 1998; Heffernan et al., 2001).

### **Human Capital (H)**

These are the "skills, knowledge, ability to labor and good health important to the ability to pursue different livelihood strategies". In terms of livestock keeping, available labor for tending of the animals would influence the decision to keep livestock, therefore, the household or compound size would be relevant to the human capital necessary for livestock keeping.

### **Physical Capital (P)**

Physical capital is considered to be the basic infrastructure (transport, shelter, water, pastures, energy and communication) and the production equipment and means which enable people to pursue livelihoods. Physical capital also encompasses the equipment people use for livestock rearing e.g. ropes, fencing, carts for transporting food, products or waste.

### **Social Capital (S)**

These are the social resources (networks, membership of groups, relationship of trust, or access to wider institutions of society) upon which people rely in pursuit of their livelihoods.

### **Financial Capital (F)**

These are the financial or economic resources which are available to the people, and which provide them with different livelihood options. Goats may

act as a form of financial capital in a number of different ways e.g. as a form of saving, as an investment, a means of generating cash in emergencies, or by acting as collateral for credit or loans.

### **Natural Capital**

These are natural assets like land, soil, water, air, genetic resources, wildlife, biodiversity, etc

### **3.2.3 Livelihood Strategies**

The framework also mentions livelihood strategies that people adopt in order to achieve livelihood outcomes. In pursuing livelihood strategies composed of different activities, both the access to assets and the use are affected by social factors – these include institutions and organizations and also exogenous trends (Khalid and Quintana, 2001)

### **3.2.4 Policies and Institutions**

According to Heffernan et al., 2000), access to the 5 physical assets is influenced by transforming structures and processes (government, private, laws, policies, culture, institutions). These also affect the ways in which people group and use their assets to achieve goals, already discussed under the “livelihood strategies” (3.2.3).

### **3.2.5 Livelihood Outcomes**

The framework also indicates the outcomes that people are looking for, termed “livelihood outcomes”, which according to the DFID includes more income, increased well-being, reduced vulnerability, increased food security and a more sustainable natural resource base (DFID, 2000) Improved well-being in this case would imply, improved access to high-quality education, information (extension), training, better nutrition and health.

The Sustainable Livelihood Framework (SLF) has been used to explore both internal and external factors which are necessary for a successful lifestyle, based on livestock production (especially goats), with the individual as a starting point. The framework should define the scope and provide the analytic basis for goat rearing

as a livelihood. The SLF will also be used to identify the main constraints and opportunities faced by the pastoralists, as expressed by them. It supports the poor people as they address the constraints, or take advantage of the opportunities.

The Sustainable Livelihood Approach (SLA) has widely been used and is increasingly being used and applied in the Turkana rural appraisals or development. This is especially those dealing with the livelihoods and poverty, by shifting the focus from problems, constraints and needs to perceived strengths, opportunities, coping strategies, and local initiatives. The SLF provides a checklist of constraints to goat rearing, which can be prioritized by actions to remove them, and the links between them identified. This current research project fits into such an analysis - in assessing what combination of livelihood strategies, with which outcomes or what structural institutions, processes that are in place to mediate the ability to follow what combination of livelihood strategies should be followed.

# CHAPTER FOUR

## 4. RESEARCH METHODOLOGY

### 4.1 Research Design

The study adopted both a descriptive and analytic design. According to Cooper (1996), a descriptive study is concerned with finding out who, what, where, and how of a phenomenon which is relative to the study. Descriptive studies are not only restricted to fact-finding, but may often result in the formulation of important principles of knowledge and solutions to significant problems. These studies are more than just a collection of data, as they involve the measurements, classification, analysis and interpretation. The design has been used successfully in the past by Njoroge (2003) and Mazrui (2003). An analytic study explains or analyses the situation by comparing groups, or by examining factors that explain the outcome. The information sought in this was for example how many goats a household kept or how many goats they owned for the past 1 to 2 years.

A combination of quantitative and qualitative research methods were also used, as they compliment each other. Triangulation was found to be the most appropriate mixed method model used. Tashakkori and Teddlie (1988) pointed out shortcomings of mono-methods in measuring underlying issues and suggested that a multi-method approach should be adopted, as it provides grounds for data triangulation. Quantitative research was used to address questions that were predominantly based on the descriptive and certain theoretical objectives of the study (Stroebe, 2004). Examples included herd dynamics and productivity measures of the livestock within the pastoral system of Turkana.

The qualitative research framework was used to address issues from theoretical and applied objectives. It was also used to collect sensitive data such as gender roles, income and assets (e.g. herd sizes). Questionnaires were further used to

quantify data and key information during interviews. According to Meinzen-Dick et al. (2004), mixed-method research can be used to enable the triangulation of data and increased analytical power as each data source assists in the interpretation of the other.

## **4.2 Unit of Measurement**

This study critically defined the appropriate unit of measurement. The pastoralist household was chosen as the “family” or “core” unit and it was challenging to define each homestead membership because of the nomadic lifestyle of the community. The household in this case is a group of people, mostly relatives, sharing the same residence (homestead). They thus share the residence, eat together, and share all livelihood resources (Stroebe, 2004).

## **4.3 Data Collection Instruments**

In this study, 4 methods of data collection were used. These included questionnaires, Focus Group Discussions (FGD), In-Depth Interviews (IDI’s) and Observations. According to Giddens (2004), each of these methods (in a similar study) aided in complimenting and verifying information using triangulation. This was used to cross-check information by taking the results of one method and comparing them with the results of the other methods or existing data. This method was an important mechanism for verifying the validity of the findings. Both primary and secondary data was collected by use of these methods.

The researcher later carried out a pre-test of the data collection instruments by piloting 3 households in the study area of Turkana. After piloting, the ambiguous questions were corrected and the questionnaires given back to the same respondents. This was done in order to determine whether the instrument would yield the envisaged data. The respondents were asked to give comments regarding the clarity and suitability of the language used and content of each parameter in the questionnaire.

### **4.3.1 Questionnaires**

Quantitative information was collected using questionnaires. The questionnaires consisted of both open and close-ended questions. This instrument targeted the head of the household, and the questionnaires were administered by the research assistants at the household level.

Parts of the questionnaires used the Likert scale (on a scale of 1 to 5) of evaluation. Njoroge (2003) and Mazrui (2003) successfully used the Likert scale in related studies and Gay (1996) postulated that descriptive data are usually best collected using questionnaires. Other researchers like Cohen and Manion (1998), Emory (1985) and Ogola and Ngachu (1993) also positively identified questionnaires as possible instruments of data collection in descriptive studies. As the design of the research is also analytic, questionnaires were found to be appropriate for data collection. The questionnaire was also used to collect information on herd dynamics and rearing, influencing the farm and family size on goat rearing in the Turkana district.

#### **4.3.2 Direct Observation and Recording**

This method of direct observation and recording was used to understand more about the livelihoods and the view points of the pastoralists regarding goat production. After the interview with targeted households, the research assistants took short transect walks in the region, to make observations on the livestock condition, markets and animal husbandry practices and aspects such as breed, feeding practices, labor and management. Observations were performed by the use of checklists/inventory. According to Kothari (2004), direct observations may offer additional information regarding the study and what activities take place. Observations were done by the researcher and the research assistants in the course of the interviews. Observations were made regarding the goats, the pastures and the areas where the livestock were concentrated.

#### **4.3.3 In-Depth Interviews (IDI's)**

These in-depth interviews were undertaken by the researcher. An in-depth interview guide was used to collect data from identified key informants who had been identified with the aid of staff from the NGO's (non-governmental

organisations) and the ministry of Agriculture and Livestock. These people were targeted for their knowledge regarding goat production and the Turkana community. The selection was purposeful, so the researcher had a 'typical' sample. This approach was also found to be cost saving. Through key informant interviews, confidential information was generated and this kind of information would have been hard to obtain by use of alternative methods. This approach also allowed flexibility, so that unanticipated issues which were relevant to the study, could be explored.

#### **4.3.4 Focus group Discussions (FGD's)**

According to Legesse (2000), a FGD technique is a process whereby a group of people (6 to 30) are brought together for a joint interview session. It is an excellent method of getting an indication of how pervasive an idea and value or behaviour is likely to be in the community. In this study, 6 FGDs, two from each region of Turkana, were used to better understand all issues regarding goat production. With the assistance of research assistants and village elders, 6 groups from the three regions (Turkana North, Central and South) were selected. A FGD guide was used to collect some variables such as- livelihood issues, cultural issues, motivators to goat keeping, goat husbandry practices, etc. During the 6 FGD's seasonal calendar and timeliness (a sequence of related events arranged in chronological order and displayed along a line) in Turkana were also discussed.

#### **4.4 Sampling Procedure**

The study targeted the whole of the Turkana district (which has 3 regions - North, Central and South). The sampling technique applied was a multi-stage sampling method, as the population of Turkana pastoralists are scattered over a large geographical area (Turkana district). The multi-stage sampling method combined cluster sampling techniques with others (Tashakkori and Teddlie, 1998).

The population of each region was further stratified into livelihood zones i.e. pastoral, agropastoral, fishery and formal employment/salaried. From each zone, 60 households were randomly selected. This resulted in a total sample of 480 households targeted for interview with questionnaires. Contact was made with a total of 471 households.

Twelve (12) research assistants and one supervisor were recruited from the area and trained by the researcher for an intense training session that included numerous pre-tests of the questionnaire. The research assistants were trained to administer the interviews in *ng'aturkana* (the local language).

Table 3: **Sample Size**

Method	Livelihood Zone	Initial target	Sampled	% sample
Questionnaires	Pastoral	60	59	98.3%
	Agro-pastoral	60	58	96.7%
	Employed/Salaried	60	60	100%
	Fishery	60	54	90%
FGD		6	6	100%
Observation Inventory		24	24	100%
IDI's		5	4	80%

## 4.5 Data analysis and Presentation

The data was processed by using the Statistical Package for Social Scientists (SPSS), version 12. This was undertaken in order to understand the stronger relationships between the different variables. SPSS employed descriptive techniques such as frequencies, means, percentages, proportions and cross-tabulations. The output of the data analysis was presented in the form of pie-charts, tables and graphs/figures.

## 4.6 Limitations

The greatest limitation of this study was the cross sectional nature of the majority of the data which was collected. Household composition, livelihood strategies and relative poverty levels varied considerably. As supported by Hargreaves (2002), this limited the study in its ability to accurately characterize the complexity of the variable.

The study was carried out at a time when a drought was prevalent and a number of humanitarian agencies were conducting food aid assessments during the same time. The respondents thus connected this study with these assessments. So, the

answers may have been influenced by the assistance or aid expected from the humanitarian agencies.

Due to the sparseness of households in the study areas, research assistants were forced to walk for longer distances in order to locate the respondents. More time was also required in order to have unconstrained dialogue with the pastoralists.

## CHAPTER FIVE

### 5. RESULTS

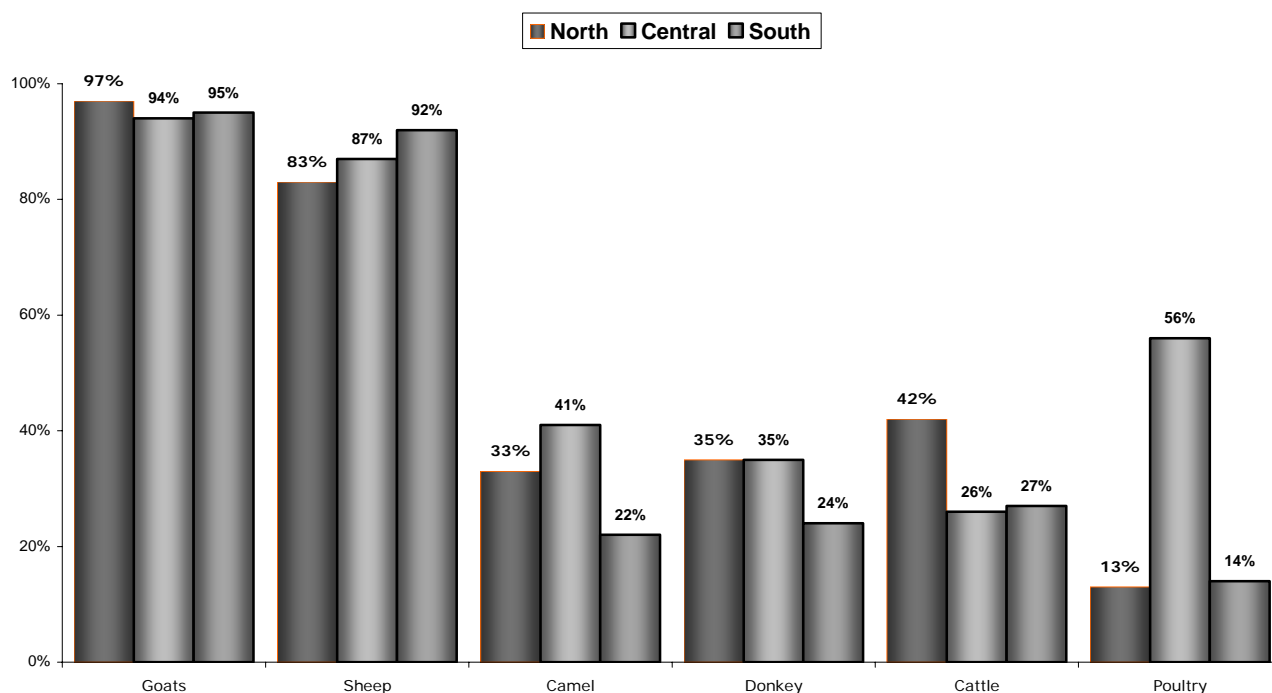
#### 5.1 THE EXTENT OF GOAT REARING IN THE TURKANA DISTRICT

Table 4 illustrates the population numbers of different livestock in the ASAL (Arid and Semi-Arid Lands) districts of Kenya. The goat population in the 11 districts was approximately 6.4 million. The Turkana and Baringo districts reported the most goat populations, with 2103308 and 1018397 respectively. According to Muturi et al. (2000), the Turkana district is dominated by the small East Africa goat.

Table 4 Livestock Population in the ASAL districts of Kenya (Muturi et al., 2000)

District	Cattle	Goats	Sheep	Camels	Donkey	Poultry	Dogs
1. Mandera	302158	525082	213947	173721	30844	100752	0
2. Moyale	397759	363041	171824	107043	27404	33534	0
3. Samburu	222413	591306	594885	7585	34508	73107	0
4. Tana River	212518	202267	136907	1022	36085	99932	4741
5. Turkana	146643	2103308	474843	124352	10326	116213	35365
6. Baringo	376286	1018397	278248	5561	7250	292717	1528
7. Marsabit	166735	357207	207264	59472	53360	113706	32344
8. Wajir	251349	379500	345507	147697	18443	594645	55973
9. Isiolo	142020	118159	125266	1970	19586	40574	7625
10. Garissa/ Ijara	548980	753759	492262	102314	15927	78882	4905
<b>Total</b>	<b>2766861</b>	<b>6412026</b>	<b>3040953</b>	<b>730737</b>	<b>253733</b>	<b>1544062</b>	<b>142481</b>

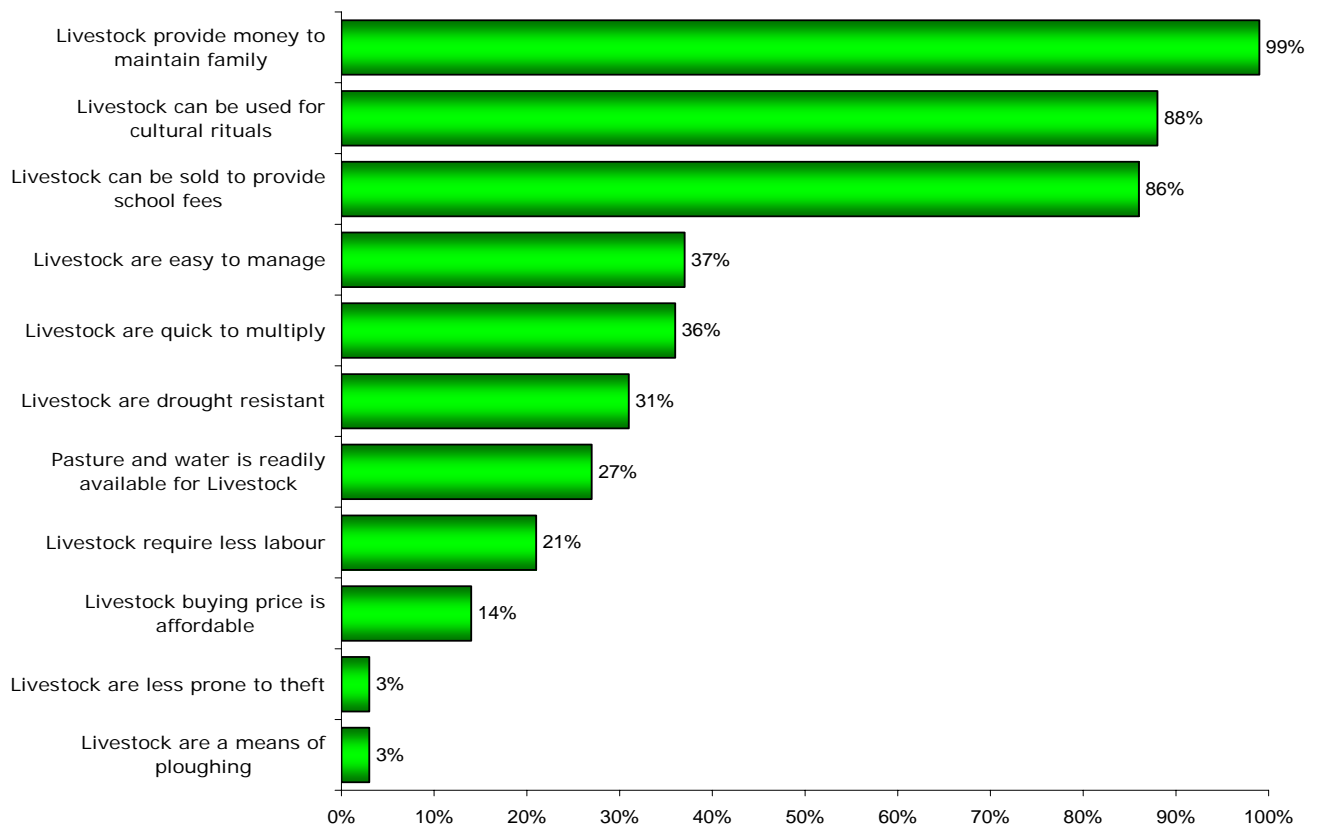
### 5.1.1 Animals farmed in different regions of Kenya



**Figure 3: Animal species farmed in the different regions of Kenya**

Figure 3 illustrates the distribution of animals across regions. Of all the regions, the most farmed animals were goats followed by sheep, camels donkeys, cattle, and poultry. For goat rearing, the Northern region has the highest distribution with 97 %, while the Southern and Central regions recorded 95 % and 94 % respectively. For sheep rearing, the Southern region had the highest occurrence with 92 %, while the Central and Northern regions recorded 87 % and 83 % respectively. Camel rearing in the Central region was the highest (with 41 %), while the Northern and Southern regions recorded 33 % and 22 % respectively. Regarding donkey rearing, the Northern and Central regions share the highest occurrence of 35 %, while in the South it was 24 %. Cattle rearing in the Northern region of Kenya was highest with 42 %, while the Southern and Central regions were 27 % and 26 % respectively. Poultry rearing in the Central region was the highest, (56 %), while the Southern and Central regions were 14 % and 13 % respectively.

### 5.1.2 Motivators to Livestock rearing as a livelihood occupation in the Turkana District



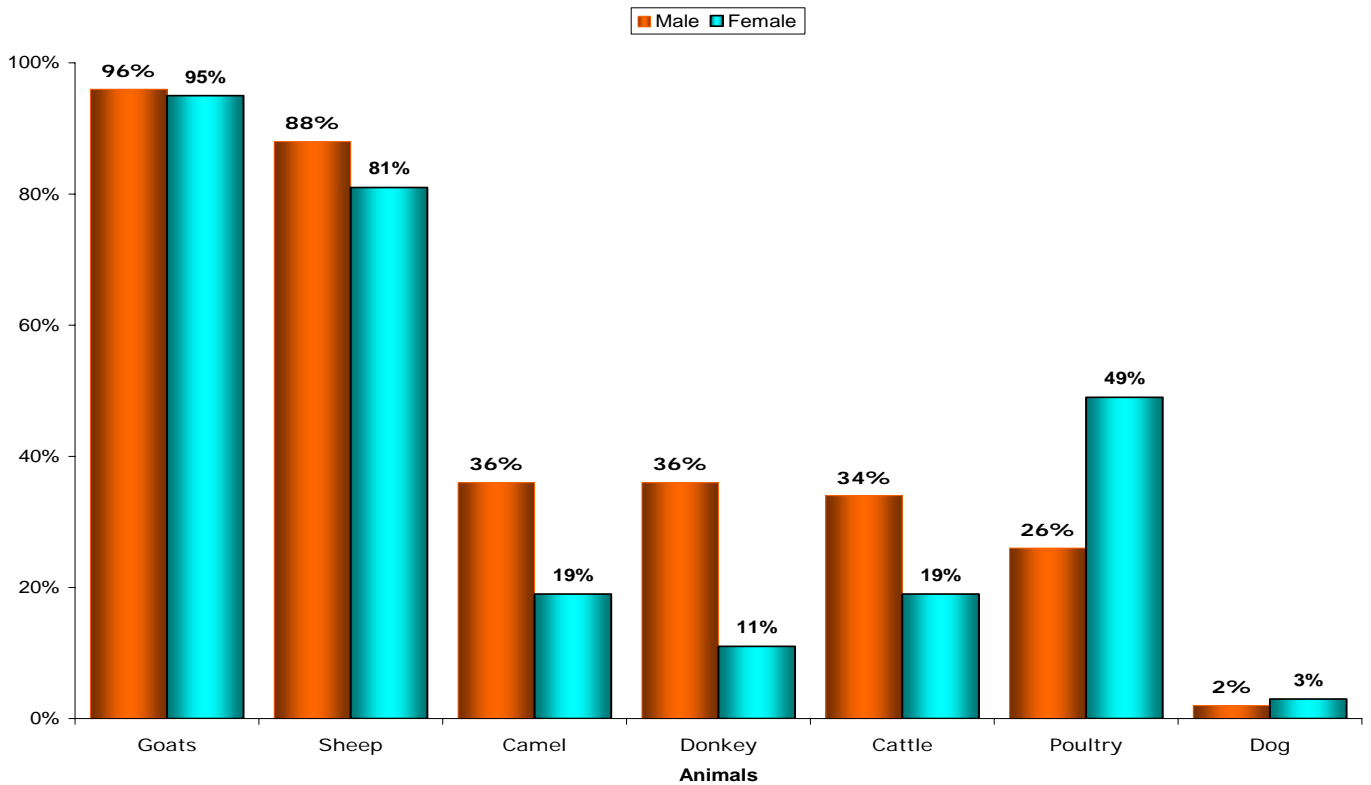
**Figure 4: The major motivators to livestock rearing as a livelihood occupation**

Figure 4 illustrates the major factors relating to livestock rearing as a livelihood occupation. The main reason for preferring the rearing of these animals was that they provide money to maintain the family – this accounted for 99 %. The other reason is that these stock provide money for school fees in 86 % of the cases. Animals reared are least used as a means of ploughing (3 % of the cases).

### 5.1.3 Rearing of Goats According to Gender of the Household

Figure 5 shows animals reared according to the gender of the head of the household. The male as the household head are the highest in terms of rearing of goats, sheep, camels, donkeys, and cattle, compared to the female household

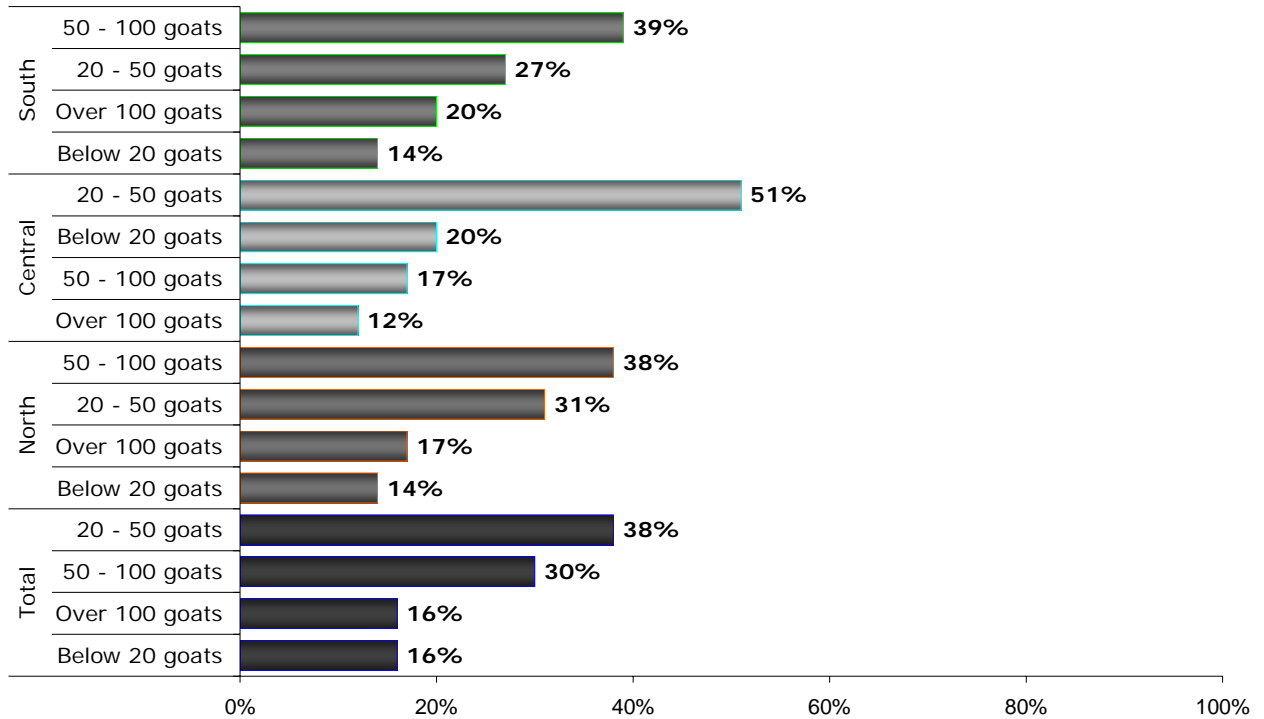
heads. The histogram clearly shows that the females as the household head are highest in the rearing of poultry and dogs. In terms of goats, sheep and camels, the male household and female household head farmed 96 % and 95 %, 88% and 81 % and 36 % and 19 % respectively.



**Figure 5: Animals reared according to gender of the household head**

#### 5.1.4 Size of goat flocks across the Turkana regions

### Size of flocks across the regions



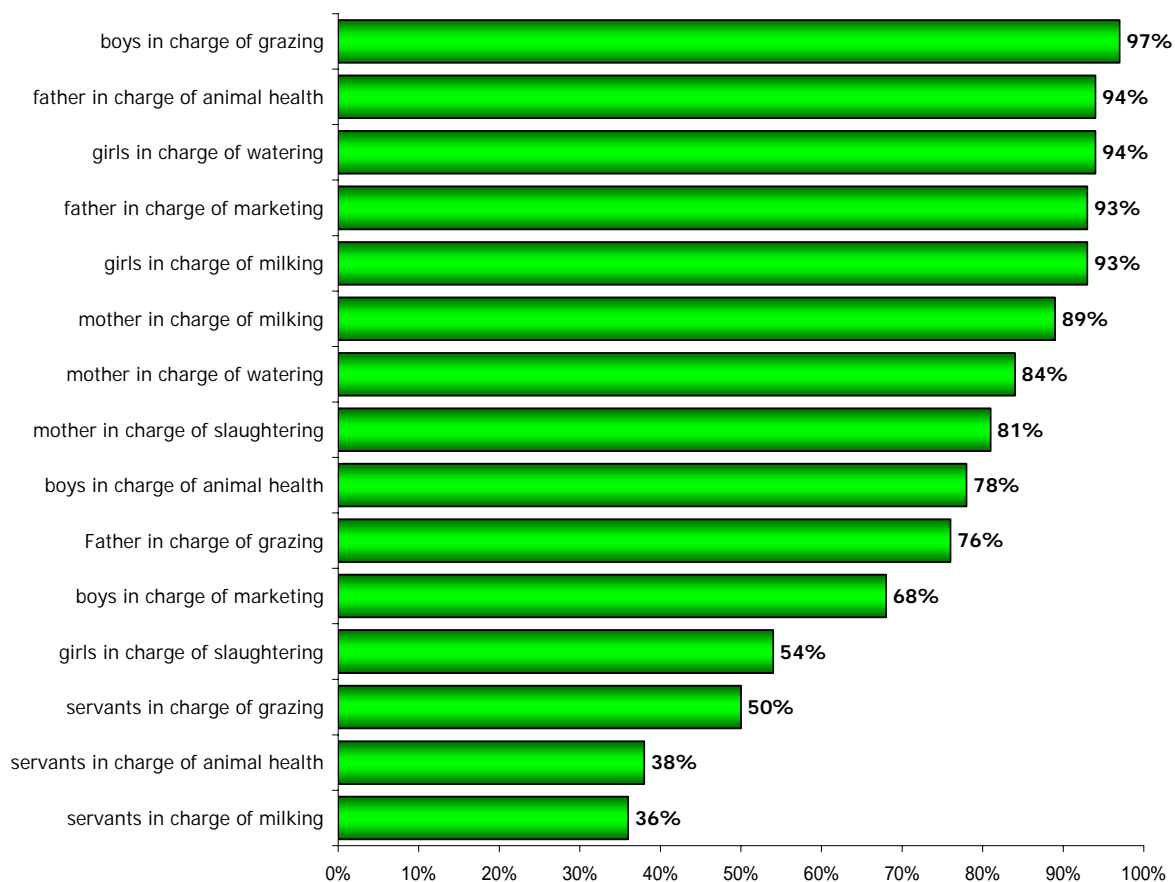
**Figure 6: The size of goat flock across the regions (North, Central, South).**

Figure 6 demonstrates the size of the goat flocks across the 3 regions in the Turkana district. The total for all regions shows that the size of flocks between 20 to 50 goats was the highest with a percentage of 38 %, followed by 50 to 100 goats (30 %). The size of flock over 100 goats and below 20 goats, was 16 %.

In the Southern and Northern regions of the Turkana district, the occurrence of the size of the goat flocks between 50 to 100 goats was highest with 39 % and 38 % respectively, followed by 20 to 50 goats in 27 % and 31 % of the cases. A goat flock size of over 100 was recorded in 20 % and 17 % of Southern and Northern regions respectively, while goat in the Central region of Turkana a goat herd size of between 20 to 50 goats accounted for 51 %. Similarly, a flock size of below 20 goats accounted for 20 %, while between 50 to 100 goats accounted for 17 % and herds of over 100 goats, accounted for 12 %.

### 5.1.5 Responsibilities in Goat Handling

Figure 7 depicts the various responsibilities in goat keeping. Boys and the servants are mostly in charge of the grazing of the animals (97 % and 38 % respectively), while mothers and girls are again mostly in charge of watering the animals (84 % and 94 % respectively). Girls and servants were mainly responsible for milking of goats (96 % and 36 % respectively), while boys took charge of the goats health and the marketing of the animals (78 % and 68 % respectively).

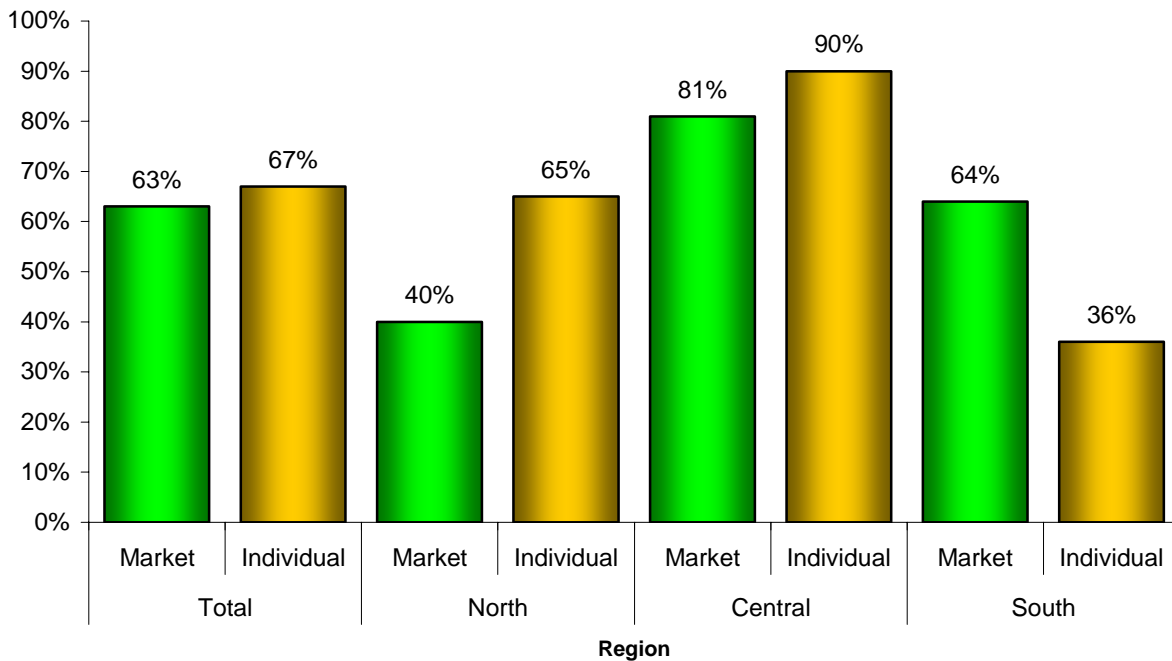


**Figure 7: Responsibilities in goats handling by members of the household**

### 5.1.6 Marketing of Goat Products

Figure 8 illustrates the distribution of markets for the goats and their products. In the overall for all the regions in Turkana, the individual market was the main means of offset (67 %), while the common market represented 63 %. In the Central

region, the highest offset was at the individual market (90 %), while the common market represented 81 %. In the Northern region, the common market was of the main means of marketing (65 %) and the individual market 40 %. In the Southern region, again the common market was less used (36 %), while the individual market was 64 %.

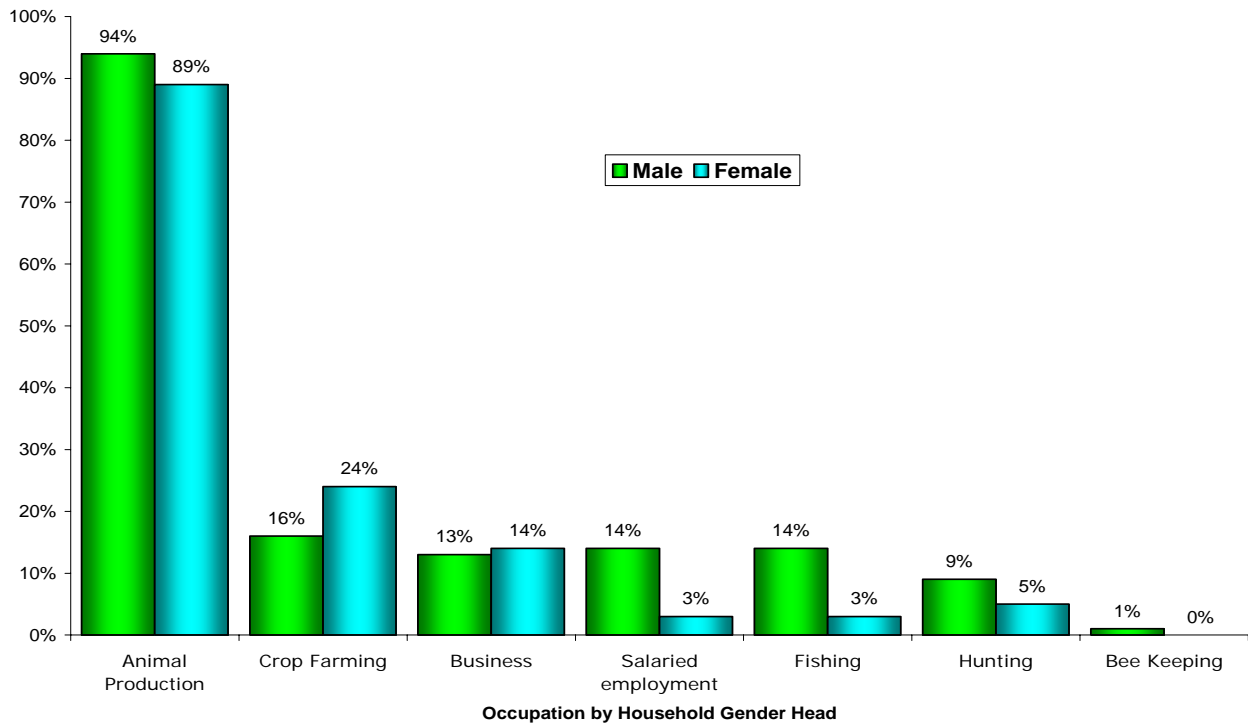


**Figure 8 The markets used for goats and their products**

## 5.2 OTHER LIVELIHOOD STRATEGIES AMONG THE TURKANA COMMUNITY

### 5.2.1 Livelihood Occupations by the head of the Household

In Figure 9 the livelihood occupations by the head of the household regarding gender is illustrated. For animal production as an occupation males represented 94 % and females 89 %. For crop farming on the other hand as an occupation, males represented 16 %, while females comprised 24 % of this activity. Having a business occupation was reflected in 13 % of the males, while females were 14 %. The salaried employment and fishing occupations were similar for males and females, with hunting as an occupation, the males made up 9 % , compared to the 5% of the females.



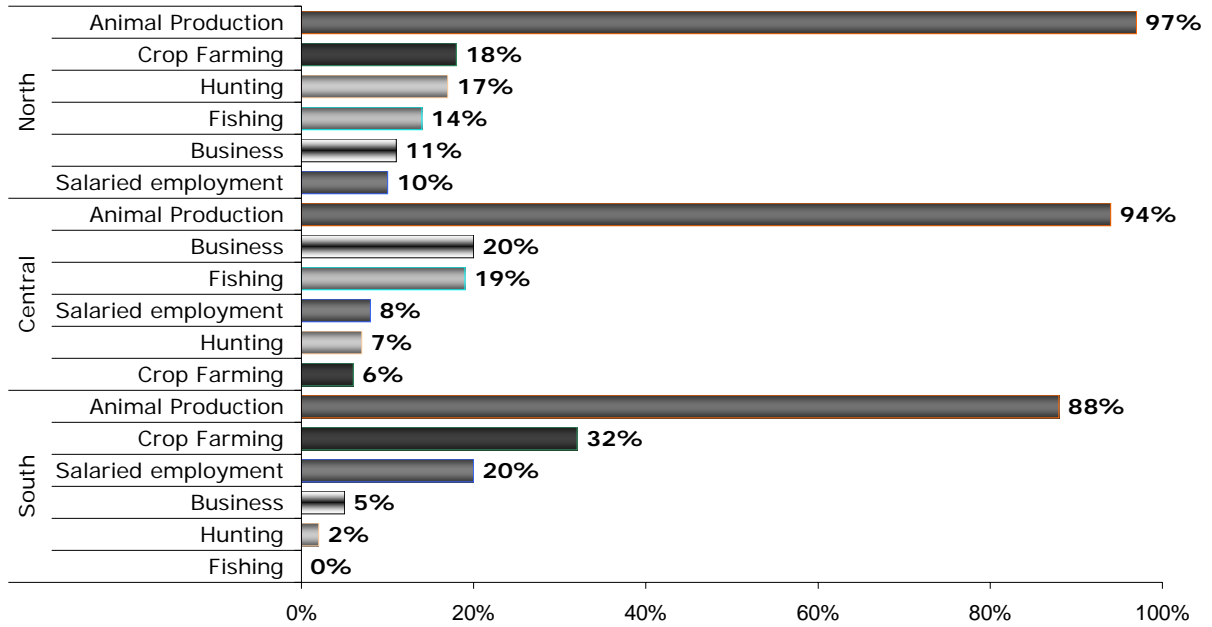
**Figure 9: The livelihood occupation by gender head of the household**

### 5.2.2 Livelihood Occupations across the different regions of Turkana

Figure 10 illustrates that of the livelihood occupations across all the regions in Turkana, animal production was the most preferred (97 %, 94 % and 88 % in Northern, Central and Southern regions respectively). In the Northern region of Turkana crop farming was followed by hunting, fishing, business, and lastly salaried employment (18 %, 17 %, 14 %, 11 %, and 10 % respectively) (Figure 10).

In the Central region, business as a livelihood was followed by fishing, salaried employment, hunting and finally crop farming with 20 %, 19 %, 8 %, 7 %, and 6 % respectively. In the Southern region, crop farming was again followed by salaried employment, business, and hunting fishing (32 %, 20 %, 5 %, and 2 % respectively). It appeared that, fishing as a livelihood is not practiced in the Southern region of Turkana.

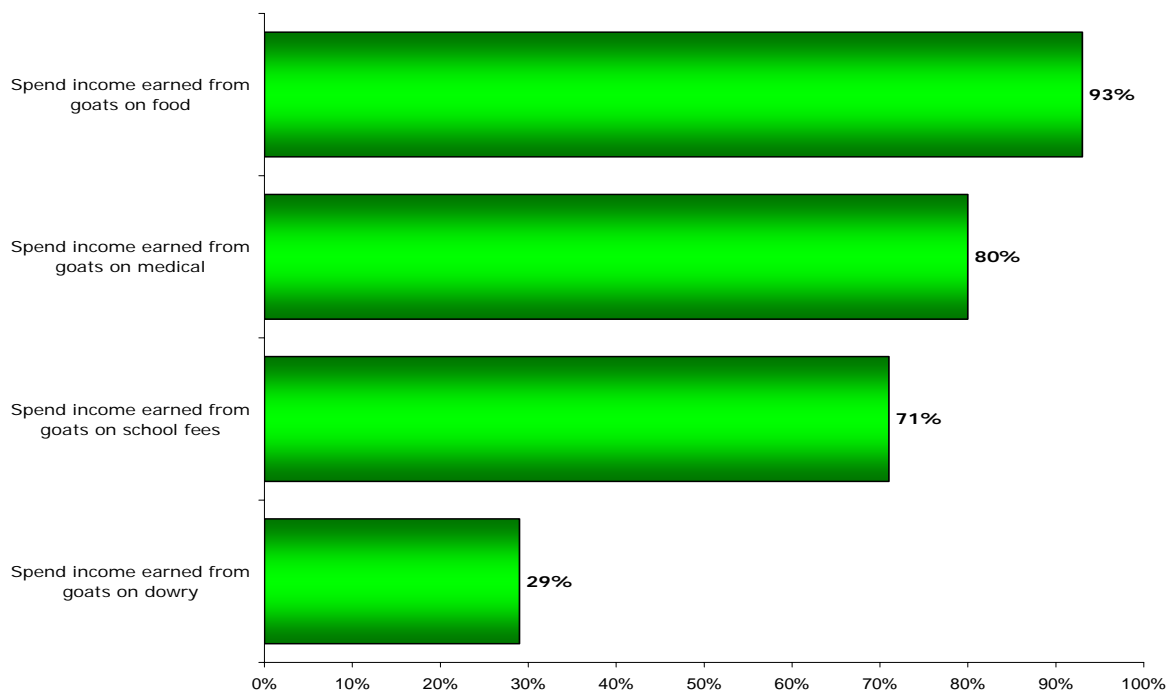
### Livelihood occupations across regions



**Figure 10: The livelihood occupations across the regions of Turkana**

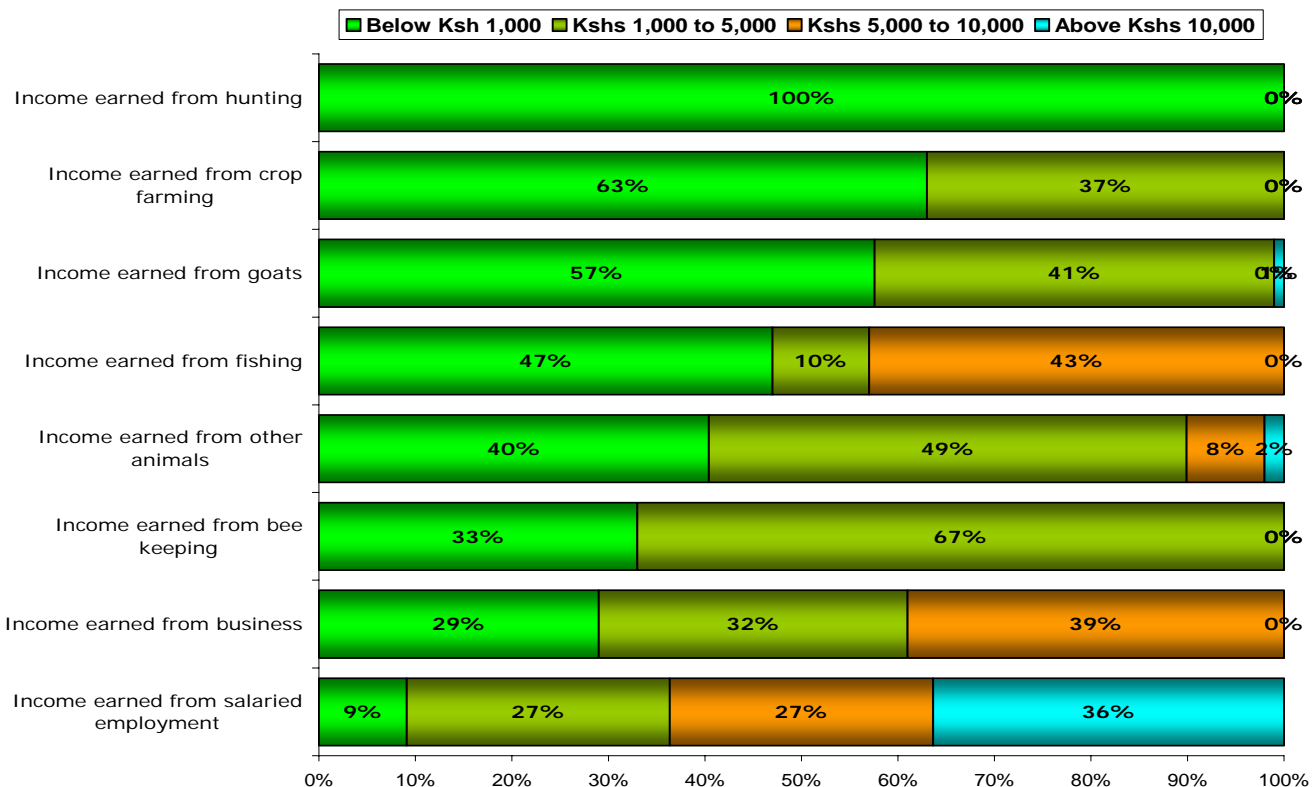
#### 5.2.3 Expenditure of income earned from goats

Figure 11 shows the expenditure of the income earned from goats. Spent income earned from goats on food accounted for 93%, while that on medical, school fees and on dowry accounted for 80%, 71% and 29%, respectively.



**Figure 11: The expenditure of income earned from goats**

### 5.2.4 Income earnings from various occupations

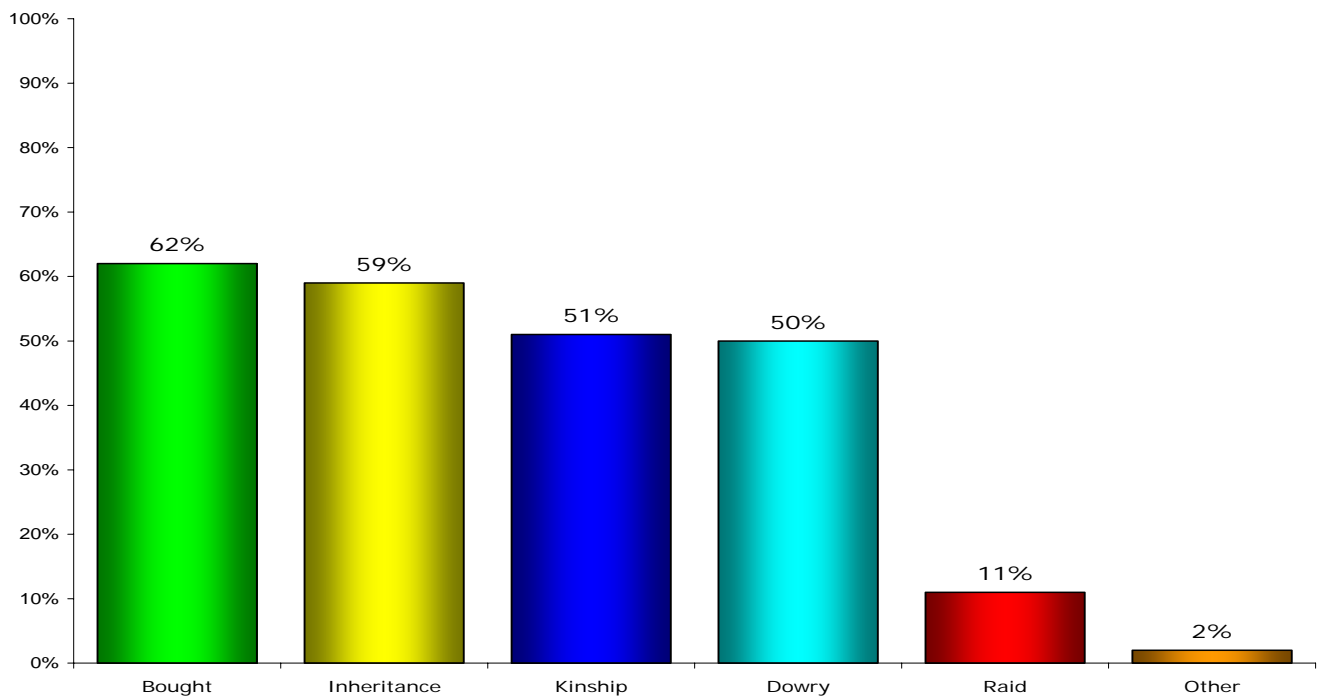


**Figure 12: Income earnings from various other occupations**

Figure 12 illustrates that the income earned (below 1000 Kshs) from goats accounts for 57 % while 41 % earned 1000 and. 5000 Kshs. The numbers in the figure indicate the proportion of households whose income is derived from the specified income source. The figure also shows that all households practice hunting (which contributes an income of 1000 Kshs per month), while the majority of households (63%) engage in crop production (that contributes an income of below 1000 Kshs per month). This is compared to 37% of households who engage in certain types of crop production and yield an income of 1000 to 5000 Kshs.

### 5.3 GOAT REARING AS A LIVELIHOOD STRATEGY

#### 5.3.1 Goat Acquiring Process

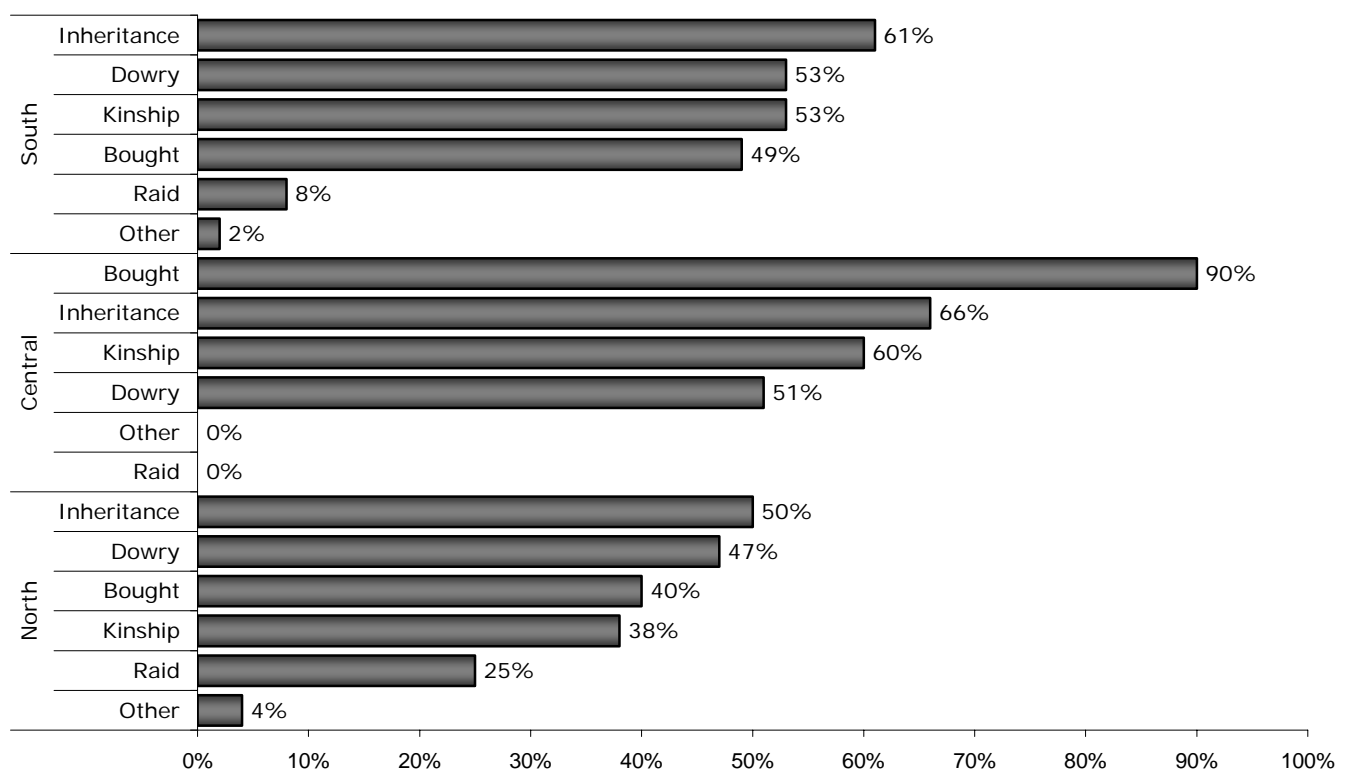


**Figure 13: Means by which goats were acquired by households**

Figure shows that 62% of the sampled households acquired goats through purchase, 59% through inheritance, 51% through kinship, 50% through dowry, 11% through raid, and 2% by other means.

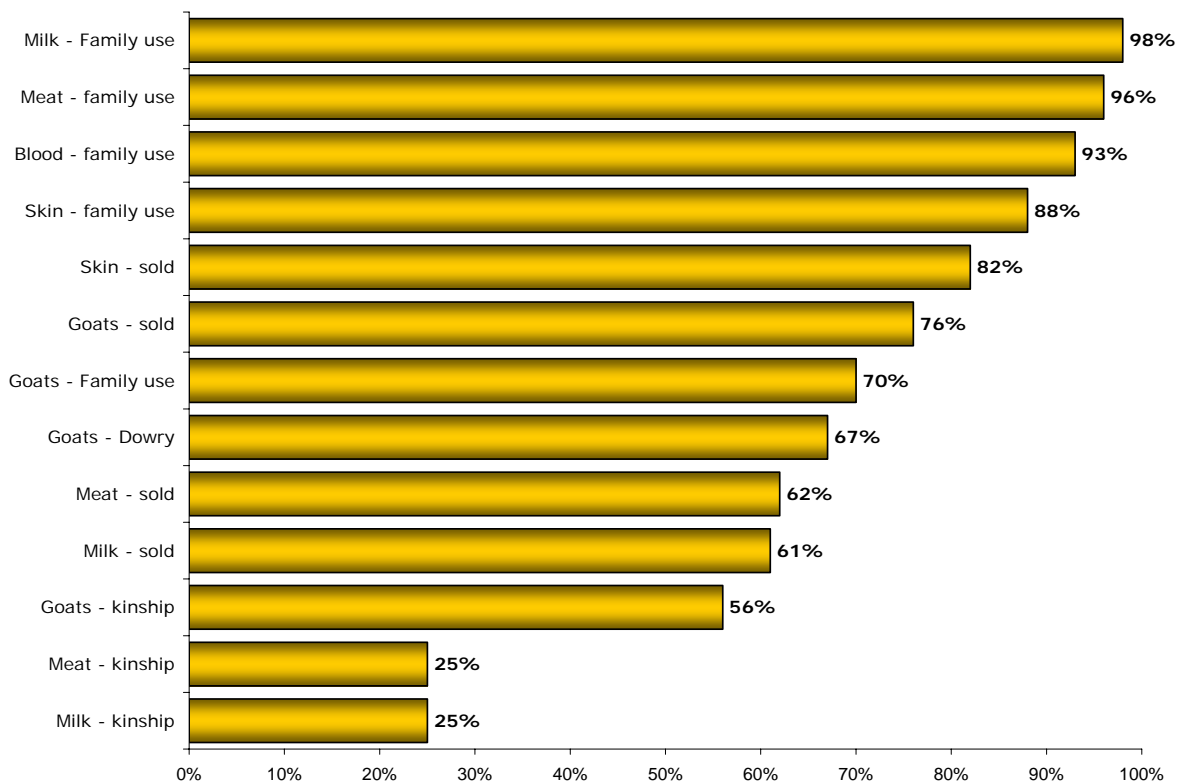
### 5.3.2 The acquisition of goats in different regions

In Figure 14 the means of acquiring goats in the different regions of Turkana are set out. In the Southern region, the highest possession of goats was via inheritance (61 %), followed by, dowry, kinship, purchase and raid (53 %, 53 %, 49 % and 8 % respectively). In the Central region, the highest possession of goats was through purchasing (90 %) then followed by inheritance, kinship, and dowry (66 %, 60 % and 51 % respectively). In the Northern region, the highest acquisition was via inheritance (50 %), followed by dowry, purchase, kinship, and raid (47 %, 40 %, 38 % and 25 % respectively).



**Figure 14: The acquisition of goats in the different regions of Turkana**

### 5.3.3 Utilization of Goat Products

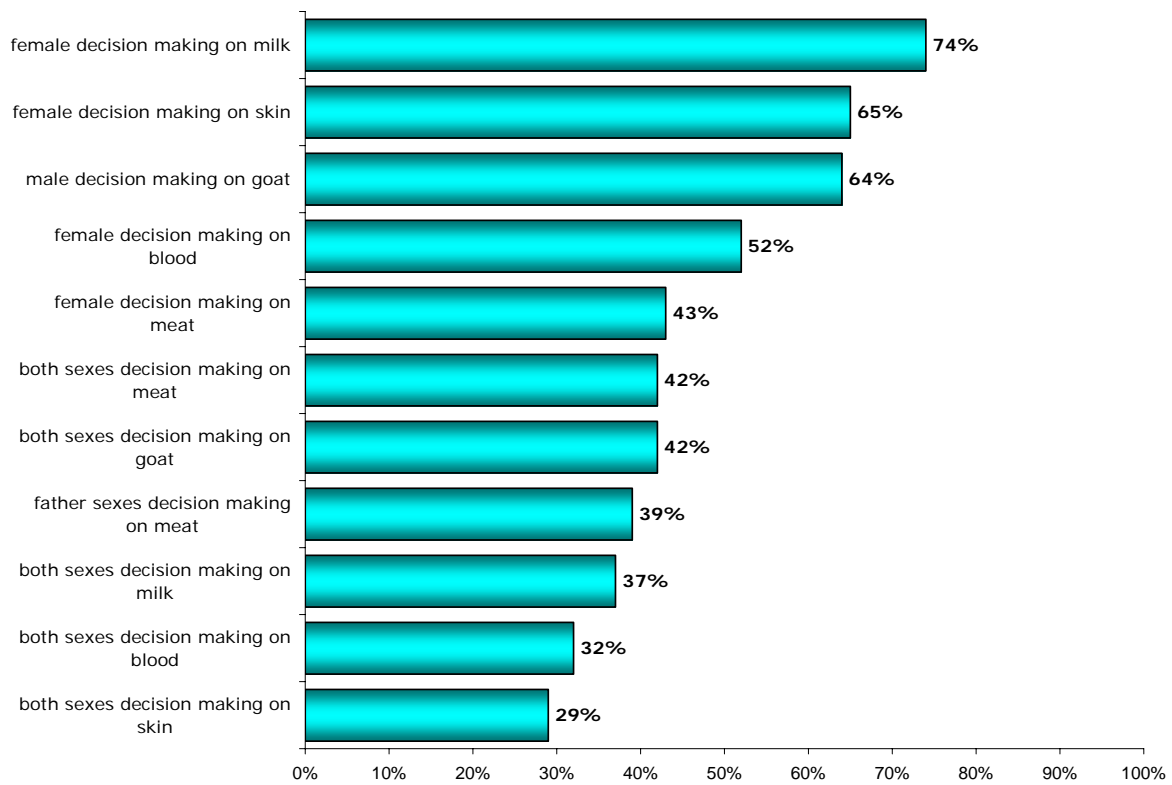


**Figure 15: The utilization of goat products by the households**

From Figure 15 it is evident that the mothers of the household are the persons who make independent decisions regarding milk and skin usage (74% and 65% respectively). The fathers (males) on the other hand make the decision on the utilization of the goat (64 %) as such. Mothers or the female head of the family takes the decision on meat and blood utilization.

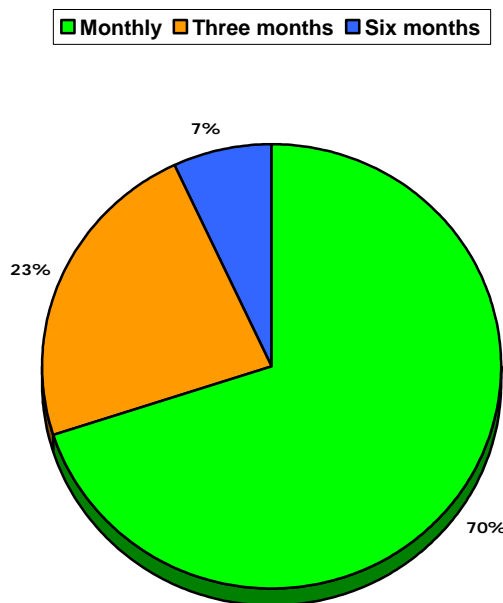
The household utilized most of the goat products (as indicated in Figure 15). Milk for family use was 98 %, milk for sale accounted for 61 %, while milk used for kinship accounted for 25 % of the total usage. Similarly, goat meat for family use accounts to 96 %, while meat for sale and kinship accounted for 62 % and 25 % respectively. Blood was mainly used for the family (93 %), while skins used by the family accounted for 88 % and skin sales accounted for 82 %. Goats for sale, for family use, for dowry and for kinship accounted for 76 %, 70 %, 67 %, and 56 % respectively.

### 5.3.4 Decision Making on the Utilization of goat products



**Figure 16: Distribution of decision making on utilization of goat products**

### 5.3.5 The Frequency of selling goats' Products



**Figure 17: The frequency of selling goat products over time**

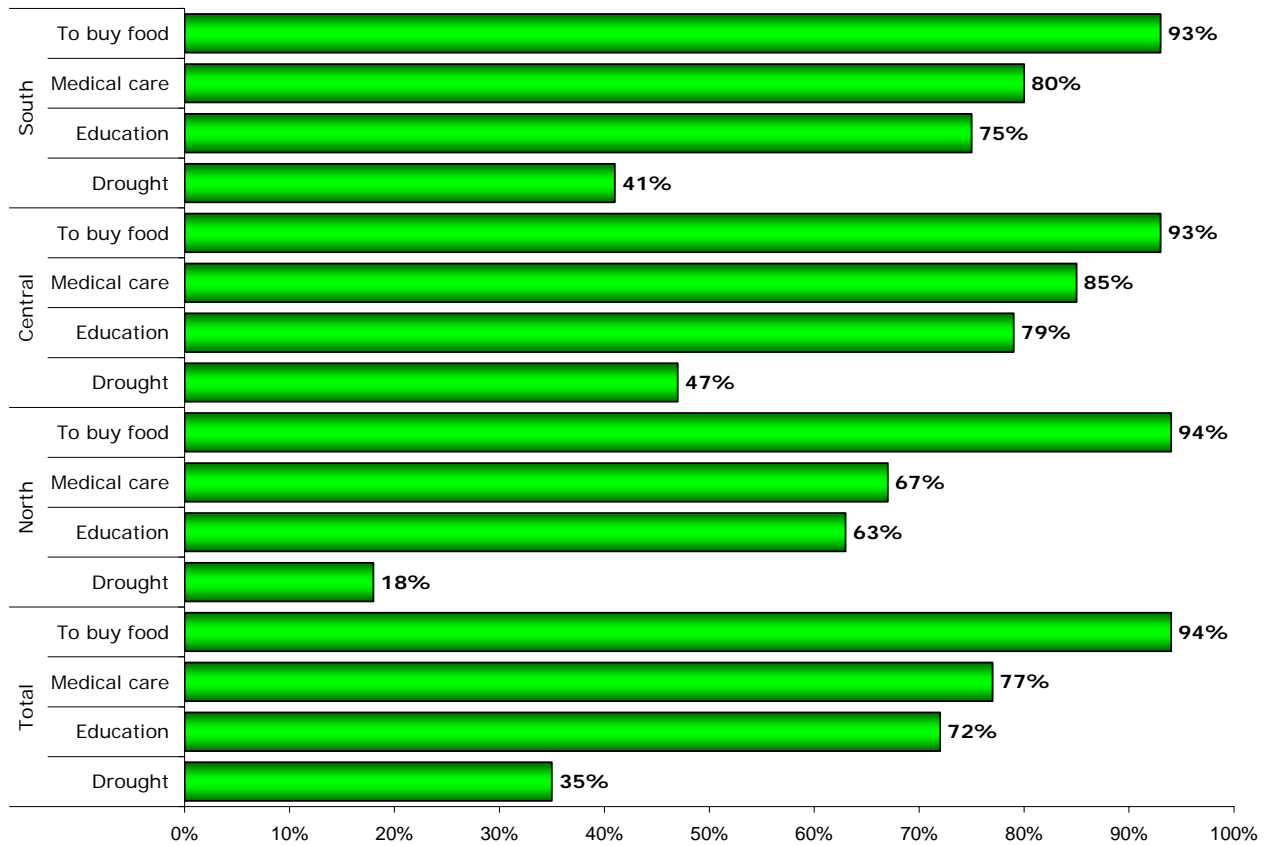
The frequency of selling goat products is illustrated in Figure 17. The frequency of selling goat products on a monthly basis was 70 %, on a 3 month, basis 23 % and on a 6 month basis 7 %.

### 5.3.6 Motivation towards selling of goats in different regions

Figure 18 illustrates the motivation of goat keepers towards the selling of goats in the Turkana region. The main motivation toward the selling of goats in all regions was to buy food (94 %) - this was followed by medical care (77 %), education and drought relief (72 % and 36 % respectively).

The major reason towards selling of goats was for the purpose of buying food - being similar in the Northern, Southern, and Central regions. The other motivator towards the selling of goats for medical care within the Central, South and Northern regions was 85 %, 80 %, and 67 % respectively. The selling of goats for education purposes in the Central, Southern and Northern regions was 79 %, 75 %, and 63%.

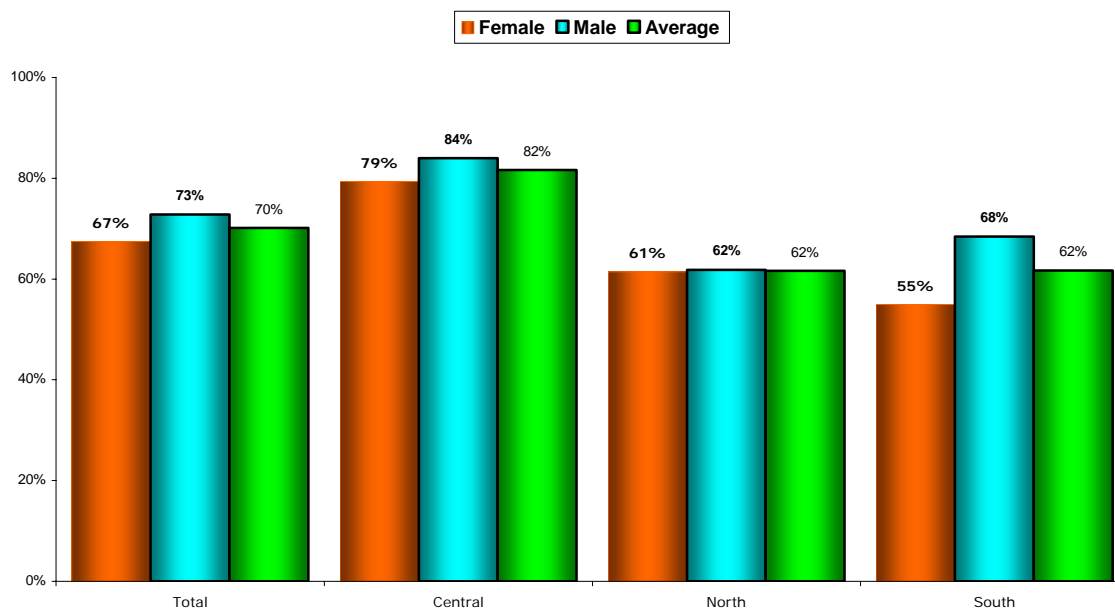
While for drought reasons (reducing stock) the distribution was 47 %, 41 %, and 18 % respectively.



**Figure 18: The motivation towards selling of goats in the different regions of Turkana**

## 5.4 GOAT REARING AS A SUSTAINABLE STRATEGY AMONG THE TURKANA PASTORALISTS

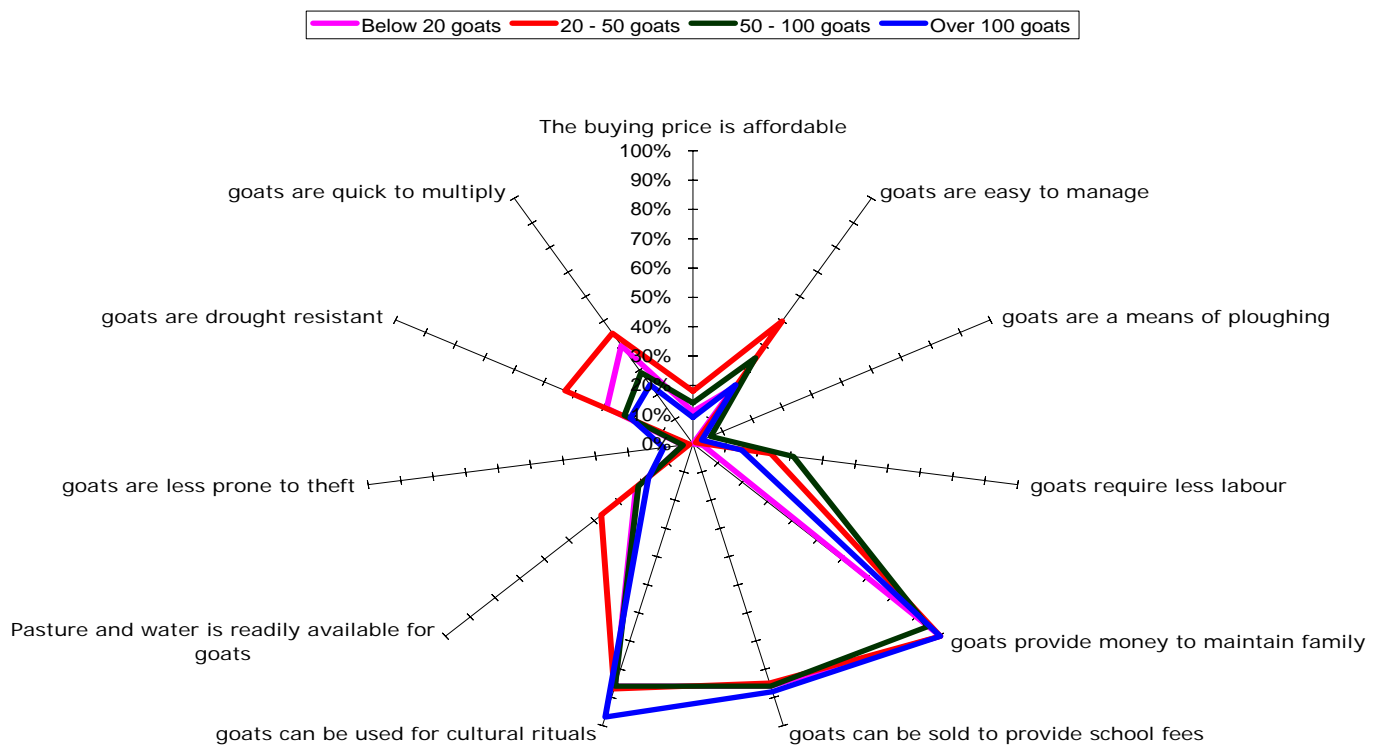
### 5.4.1 Survival Rate of Goat kids by gender



**Figure 19: The survival rates among goat kids by gender**

Figure 19 illustrates the survival rate among goat kids by gender in the different regions. The overall survival rate shows that in all the regions the survival rate among goat kids was 73 % for the males, while female kids had a survival rate of 67 % and the average was 70 %. The Central region had the highest average survival rate when compared to the Northern and Southern regions of Turkana. In the Central region, males showed a 84 % survival rate, while females recorded 79 %. In Northern region, the survival rate among male goat kids was 62 %, compared to 61% for females. In the Southern region, male kids had a 68 % survival rate while females recorded 55 % survival rate among goats' kids. Figure 19 also demonstrates the male goat kid having the highest overall survival rate in all the regions of Turkana.

## 5.4.2 Motivators to Livestock Keeping as a Livelihood Occupation



**Figure 20: The factors that motivate goat keeping as a livelihood occupation in relation to the flock size.**

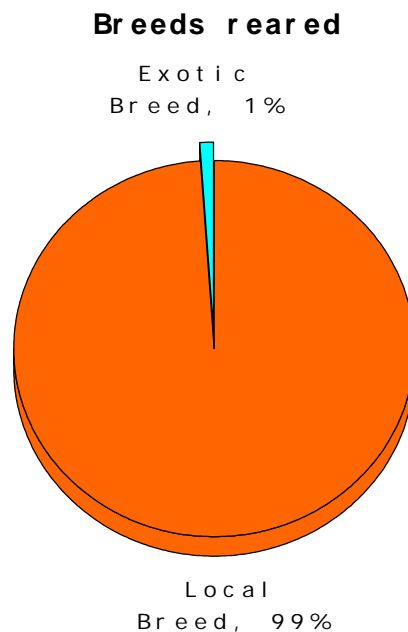
The diagrammatic presentation (Figure 20) illustrates the factors that motivate people to goat keeping as a livelihood, with regard to flock size. For a person to choose to keep over 100 goats, means that the utilization factors such as for cultural rituals, for providing school fees, and proving money to maintain the family are seen to the major factors driving this livestock rearing enterprise. Minor factors such as the goat being drought resistant, quick to multiply and easy to manage, readily available pastures and less labor, less prone to theft and the buying prices being affordable were also seen as contributing factors.

For a person to keep between 50 to 100 goats, the major contributing reasons are that goats can be used for cultural rituals, can be sold to provide school fees and provide money to maintain the family. Minor reasons include that goats require less labor, are easy to manage, quick to multiply, and goats are drought resistant.

Opting to keep 20 to 50 goats as a livelihood means, the major reasons are that goats can be used for cultural rituals. Goats can be sold to provide school fees, and provide money to maintain the family. The less important reasons here also included the fact that goats are drought resistant, quick to multiply and easy to manage. Pastures is available and less labour is required, while goats are less prone to theft and also the buying price is affordable.

Selecting to keep a herd of 20 goats means, the major contributing factor are that they also provide money to maintain the family, are easy to manage, the buying price is affordable, are quick to multiply and are drought resistant.

### 5.4.3 Goat Breeds reared In Turkana

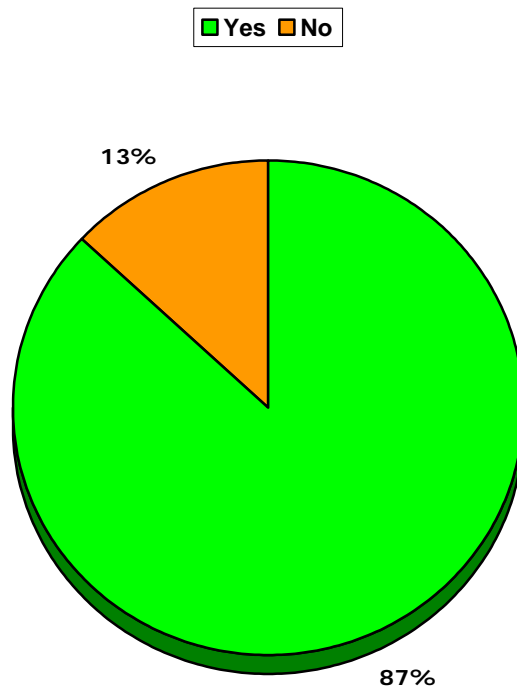


**Figure 21: The goat breeds reared in the rural areas of Turkana**

During the focused group discussions (FGD), respondents affirmed that some goat exotic breeds introduced into the district have been accepted by the community. This suggests as to their willingness to diversify goat breeds. The pastoralists believed that exotic breeds produce more, but are less resistant to diseases and the harsh environment.

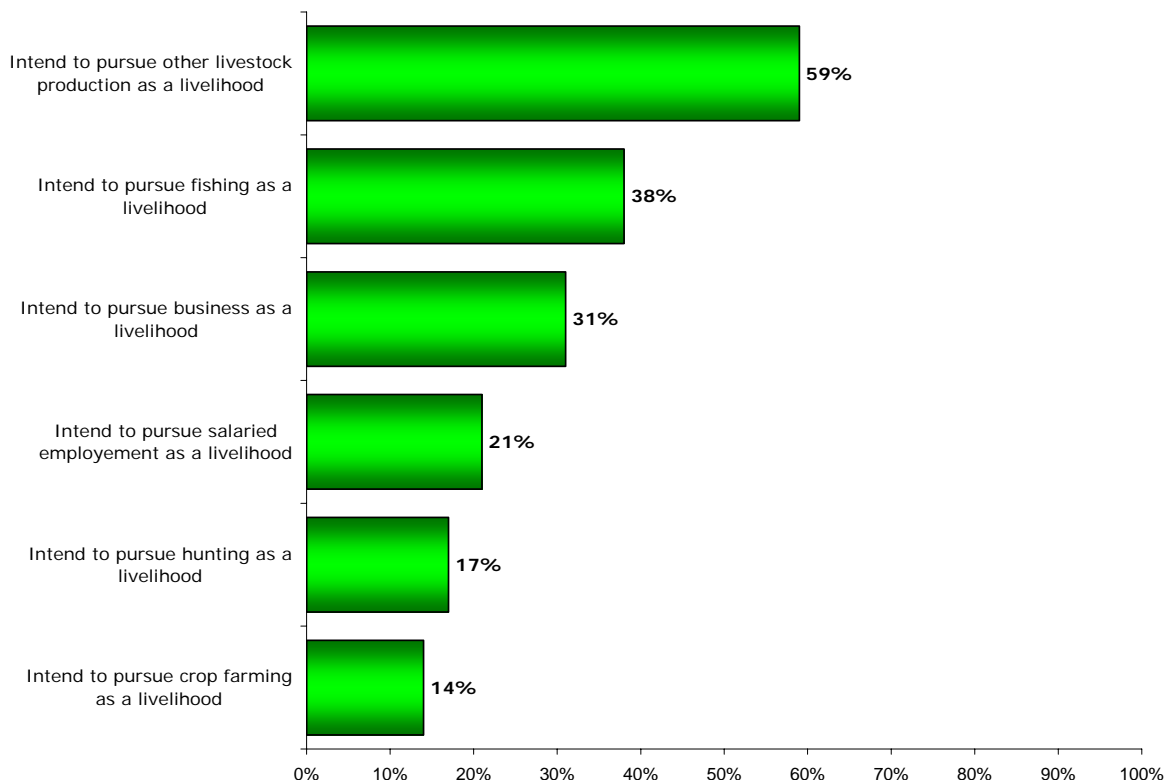
#### 5.4.4 Intention to pursue other Livelihood occupations

Figure 22 indicates that the majority (87%) of the households intend to pursue other livelihood occupations than the goat production. These occupations are set out in Figure 23.



**Figure 22: Intention in pursuing other sustainable livelihood occupations**

Of the livelihood strategies quoted, 59 % account for livestock production, 38 % for fishing, 31 % for those pursuing businesses, 21 % for those pursuing salaried employment and 17 % for hunting as a livelihood. For the Turkana district, 14 % of the strategies account for crop farming as a livelihood (Figure 23).



**Figure 23: Other livelihoods strategies pursued by pastoralists**

During a FGD, the respondents, when asked to mention the kind of animals preferred other than goats, these were some of the statements:

*“Goats and donkey. nce you get goats, other animals can also be acquired...donkeys can then be added for transportation. A man is considered rich when he has combined both goats and any other type of livestock”*

#### 5.4.5 Grazing areas of goats in the Turkana district

**Table 5: Grazing areas of goats in the Turkana district**

	Total	North	Central	South
Total number of respondents	217	72	86	59
Graze on mountains/hills	67%	65%	74%	58%
Graze on river banks	68%	51%	92%	54%
Graze on Plains	63%	56%	63%	71%
Graze on lake shores	6%	7%	8%	0%
No response	1%	1%	1%	0%

The major natural pastures preferred for goat production are the river banks ( 68 %), while 67 % of the pastoralists use pastures in the mountains/hills and 63 % graze the flat lands. A small portion (6 %) of the pastoralists graze the lake shores as indicated in Table 5.

#### 5.4.6 Forms of Land ownership

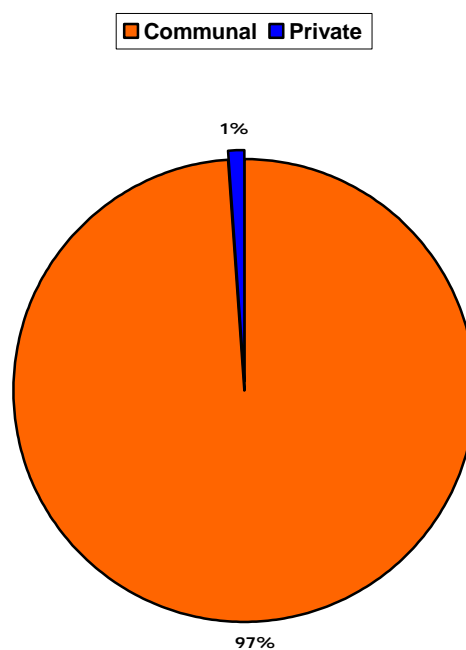


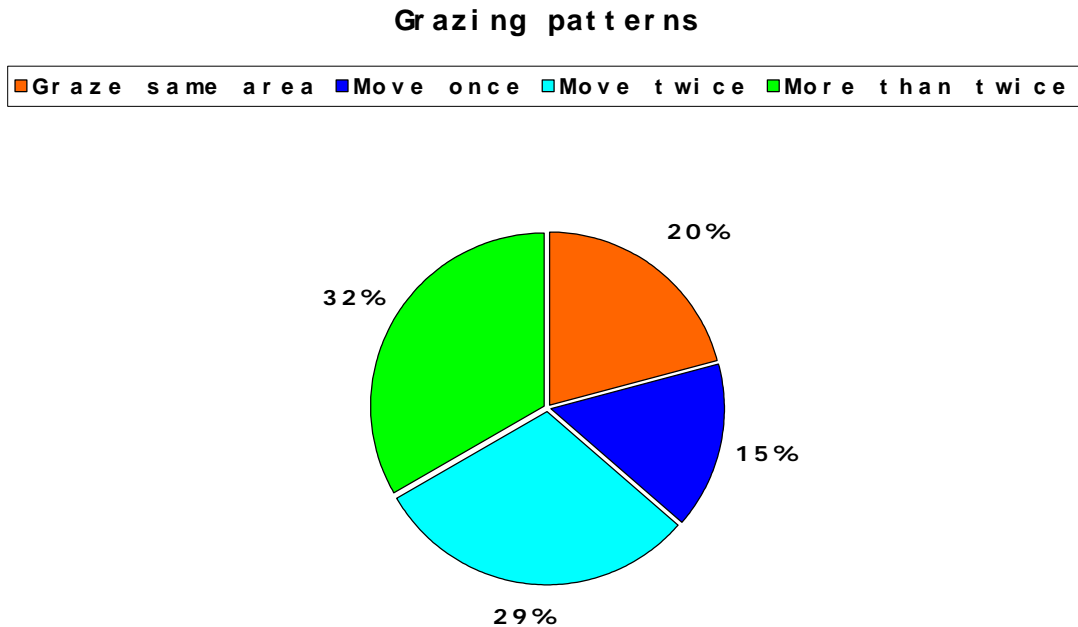
Figure 24: **Forms of land ownership by pastoralists in the Turkana district**

Figure 24 demonstrates the distribution of land ownership in the region. As can be seen, 97 % of the land is owned by the community. Only a very small part of the land in the Turkana area is privately owned.

#### 5.4.7 Grazing Patterns of the Turkana Pastoralists

Figure 25 indicates that 32 % of the pastoralists utilized more than two grazing areas in a year. 29 % of the pastoralists utilize two grazing areas, while 20%

grazing is restricted to the same area. Lastly 15 % of the pastoralists have only one grazing strategy.

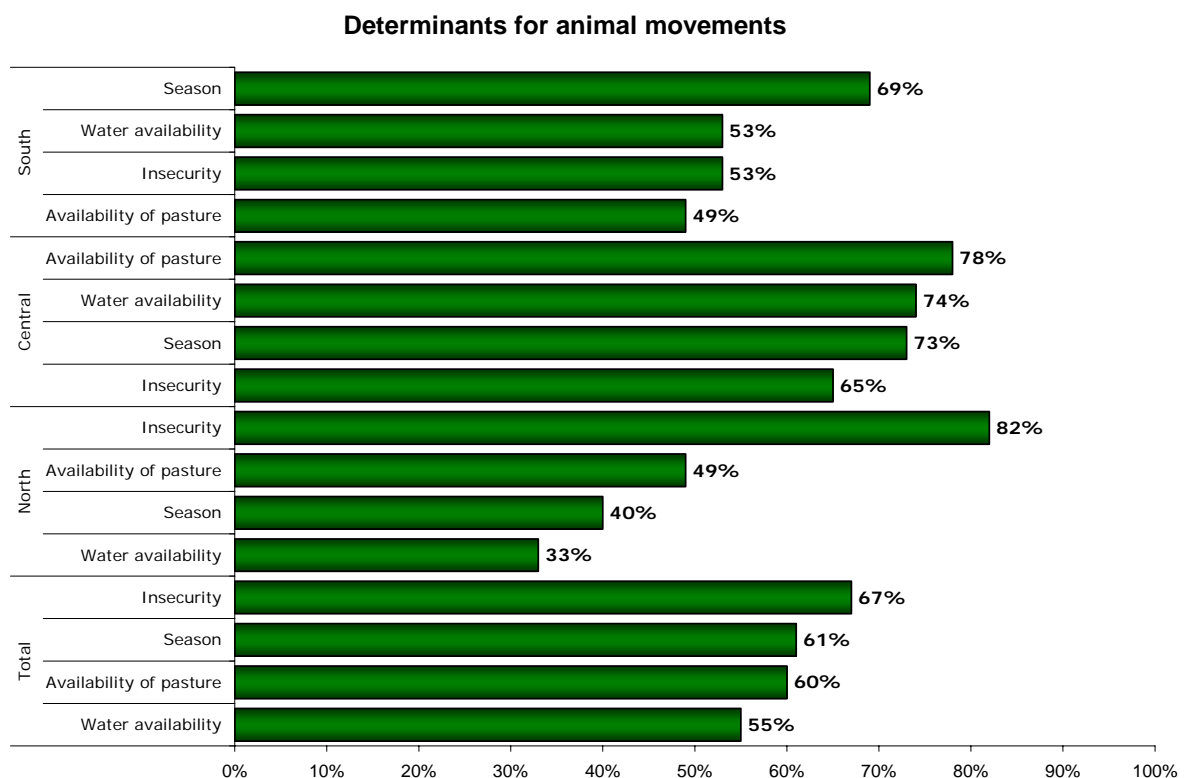


**Figure 25: Grazing patterns of the goat producers in the Turkana district**

During a FGD, the respondents explained the reasons for the seasonal movement of their goats both during the dry and the wet seasons. The animals graze along the river banks during the dry season and moved to the mountainous areas during the rainy season. It was also stated that there are no definite boundaries when it came to the grazing of the animals. For goats, the respondents stated that, the animals eat anything, including plastic and paper. This, the pastoral people believe, that goats can survive even when there is an extreme shortage of browse during droughts. One of the respondents stated the following when asked about the eating habits of goats

*“ Emnaate ngaanei kosi tani ngacin na lokwaket-nyemisito. Ibore eyaritotor ngini”* meaning: Our goats eat anything, plastic, paper, and ‘the shit of HIV infected persons. This how they survive.

## 5.4.8 Determinants of animal movements



**Figure 26: Determinants of animal movements from one area to the next**

Figure 26 shows the determinants for animal movements i.e. why pastoralists have to move with their goats. The overall reasons shows that in all the regions of Turkana the main determinants are insecurity ( 67 %), season ( 61 %), while availability of pasture and water make up 60 % and 55 % respectively.

In the Southern region of Turkana, season ranked the largest main determinant for animal movements (69 %), water availability and insecurity both recorded 53 %, with the availability of pastures being 49 %. In the Central region, the availability of pasture was the main determinant (78 %), with water availability, season, and insecurity being 74 %, 73 %, and 65 % respectively. The Northern region stated insecurity to be the main determinant for animal movements (82 %), with the availability of pasture and season and the availability of water being 49 %, 40 %, and 33 % respectively.

The current findings show that reasons to why animals are moved from one area to the next varied according to the regions in which the pastoralists are. On average, the reasons were insecurity, seasonality and the availability of pasture and water in that specific order.

During the focus group discussions (FGD's), the participants explained the goat seasonal calendar in the Turkana district. The summary is as indicated below.

Table 6: **Seasonal Calendar (Goat - rearing related activities undertaken in each area during specific months)**

Month (Eng)	Month (Turkana)	Description
January	<i>Lokwang'</i>	Means "the moon becomes too bright, hot, the whole area becomes clear, the grass reduce. Animals move towards the lake". Dry season: Dry spell intensifies. Some household members seek other alternatives to provide food for the family. Water and pastures become scarce as livestock are moved further to more insecure areas. Peace negotiations to enable animals access to pasture are carried out by the elders. Young men embark on intensive security patrols. Camels are slaughtered to provide meat for the family and some wild fruits are harvested to supplement other foods.
February	<i>Lodung'e</i>	Means "end of bad times-drought". End of the dry season: Animals are sold or exchanged in large numbers to obtain grains from the shops and the agro-pastoralists. Preserved meat and wild fruit are also consumed. The emigrants start returning to assist in livestock activities.
March	<i>Lomaruk</i>	Means "the clouds are seen, signs of rain emerge". This is when signs of rains are eminent, indicating the wet season. Animals start to move towards the plains. Rain is not yet adequate to provide enough grass for the animals".
April	<i>Titima</i>	Means "when there is a lot of old cow dung, lots of mud and the grass and water is available. Indicating good times". Wet season. Grasses start to germinate. Milk available, but not enough yet. All goats are back near to the main homestead. People are relaxed as livestock graze around the homesteads
May	<i>El'el</i>	Means "times of splendor". Wet season: There is enough grass, which feed the livestock. Milk is processed and preserved for future use. People now visit friends and undertake other activities such as the preparation for weddings and initiation ceremonies.
June	<i>Lochoto</i>	Means "mud". Happy times. Lots of dancing". Plenty of rain with a lot of mud

July	<i>Losuban</i>	Means that sacrifices and marriages take place. Plenty of meat for ceremonies conducted during this time. Everybody is back home to prepare for the next season.
August	<i>Lotiak</i>	Means "good times are separated from bad times". This marks the end of wet season. Goats are around the main homestead, but accessing the pasture and water quite a distance away. Milk yield is reduced and bleeding of livestock (to extract blood for food) starts. Labor to undertake husbandry practices intensifies
Sept	<i>Lolong'u</i>	Means that dry season sets in. This is the dry season. During this period, milk yield decreases, but milk from camels remain sufficient. There is an increased search for food. Goat herds are split into groups. Milking herds are left with the elderly at the main homestead in the plains. Young stock are moved towards the dry grazing areas situated in the mountains and main rivers. Young men and women take charge.
Oct	<i>Lopo</i>	Dry season. Dry spells intensify. Acacia pods ripen and provide fodder for livestock. Demand for labor intensifies.
Nov	<i>Lorara</i>	Dry season. Goat herds go deep into the dry season areas. Water and pastures insufficient but enough through intensive movement of herds. Variety of wild fruits and plant leaves and droppings are gathered and eaten by the people. This supplements blood and grains purchased from shops. Blood is consumed; cattle are slaughtered or exchanged for grain with agro-pastoralists. Intensive security patrols and digging of wells to provide livestock with water.
Dec	<i>Lomuk</i>	Dry season. Some short and sporadic rain appears, providing some areas with patches grass. Turkana pastoralists become highly mobile to reach the grasses before drying off. Slaughter and exchange/sale of small stock to obtain grains begins.

Source: Focus group Discussions Turkana District; Kapolon (2006) ; Aemun (2007)

While conducting these focus group discussions (FGD's), respondents discussed the droughts in the Turkana district. The respondents generally explained that the seasons have changed. This is how one of pastoralists put it:

*"Times have now changed..... There is prolonged drought in most areas..... The dry months and wet months have changed..... There are showers only during the wet season..... even grass do not germinate. There is a lot of wind (dust storms)..... Prosopis has dried most of the other trees. Prosopis have also killed the animals. ....The rain used to come from the East, but this has changed and now comes from the North, and only brings showers..... Trees were not cut, but people cut lots of trees these days. People should be given humanitarian assistance first before animals are assisted. There is also need for veterinary drugs.....".*

The analysis of the major reasons for droughts by the respondents are summarized in Table 6.

Below is the analysis of the major characteristics of droughts and the respondents discussion (Table 7)

Table 7: **Timeframe of the major drought, epidemics or insecurity events that have occurred over time**

	Turkana (Translation)	Secondary (Kapolon, 2007)source
Current	<i>Tokona</i>	This period was called "Napeikopo". Meaning only one tin of relief maize allocated for a whole family. The goat disease Lomoo (PPR), killed many goats. There was continuous distribution of relief food but only in very small quantities. The number of people in need of aid was too many. Unknown animal diseases broke out and killed many goats. Response to contain the disease took quite some time. Animals were being wiped out. People have come to town to sell firewood. The prices of goats are low and yet the prices of other food stuffs have increased
2000	<i>Kidiirik/Epompo</i>	This was referred to as " <i>Ekaru a ngatosa</i> ". Meaning, the year of dry meat fillets. Weak animals were purchased, slaughtered and the meat converted into fillets. The fillets were distributed to schools and hospitals.
1990	<i>Akalkal</i>	The period was referred to as " <i>Akalkal</i> ". Meaning "plastic paper". During this period, a lot of relief food was distributed in settlements and beneficiaries had to carry with them large polythene sacks to collect food. People left their livestock and moved to settlements where large quantities of maize were provided. There was intense hunger where people went to the Lake region to look for fish.
1980	<i>Lopiar</i>	The period was referred to as " <i>Lopiar</i> ". Meaning -wiping out. There was drought and diseases (CCPP). Humanitarian agencies launched major relief operations. Yellow maize was distributed. The drought was accompanied by animal diseases.
1970	<i>Kimududu/Kibe kbek</i>	Drought was severe, but no relief food was provided. Livestock and people became weak and drowsy. People even started eating hides and skins of the dead animals. <i>Kimududu</i> meant- many livestock and people were affected by the drought.
1960	<i>Namotor/Anyan g'adung</i>	This period was referred to as " <i>Namotor</i> ". Meaning very thin and boney animals with protruding backbone. This was a period of intense drought where people were separated and taken to the Lake Turkana famine camp. The better-off individuals were advised against reliance on relief food.

Source: Focus group Discussions-Turkana District; Kapolon (2007); Aemun (2006)

## **5.5 STRESSES AND CONSTRAINTS ON GOAT PRODUCTION IN THE TURKANA COMMUNITY**

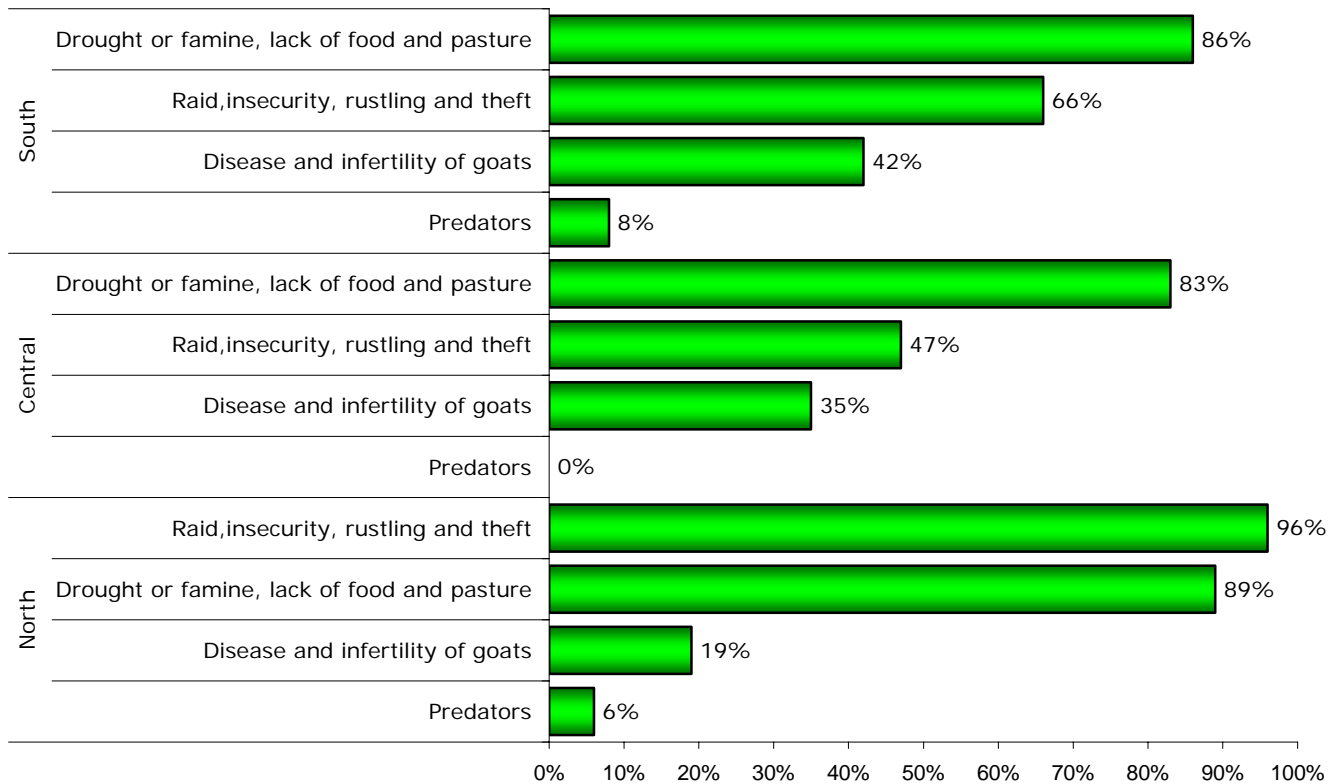
### **5.5.1 INTRODUCTION**

In a similar study, Conroy and Rangnekar (2000), found similar constraints which were related to livestock production. It was generally evident that drought or famine, lack of food and pastures were the main challenges hampering the rearing of goats. The secondary challenge to goat - rearing was raids, insecurity, rustling and theft. Falling in the third category was animal diseases and the infertility of the goats. The last constraint was predators. It was interesting to note that marketing did not feature as one of the main challenges mentioned by the respondents.

### **5.5.2 Challenges facing goat rearing in Turkana**

The challenges facing goat rearing in the various regions are set out in Figure 27. In the Southern and Central regions, the major challenges were ranked the same for drought or famine, with a lack of food and pastures accounting for 86 % and 83 % of the challenges respectively. Raids, insecurity, rustling and theft accounted for 66 % and 47 % of the problems respectively. Disease and infertility in the goats contributed 42 % and 35 % of the challenges respectively, while the occurrence of predators accounted for only 8 %.

In the Northern region of Turkana, the major challenge was raid, insecurity, rustling and theft - accounting for 96 % of the losses. Drought or famine, lack of food and pastures contributed 89 %, while disease and infertility of goats accounted for 19 %. Predators were responsible for only 6 % of the mortalities.

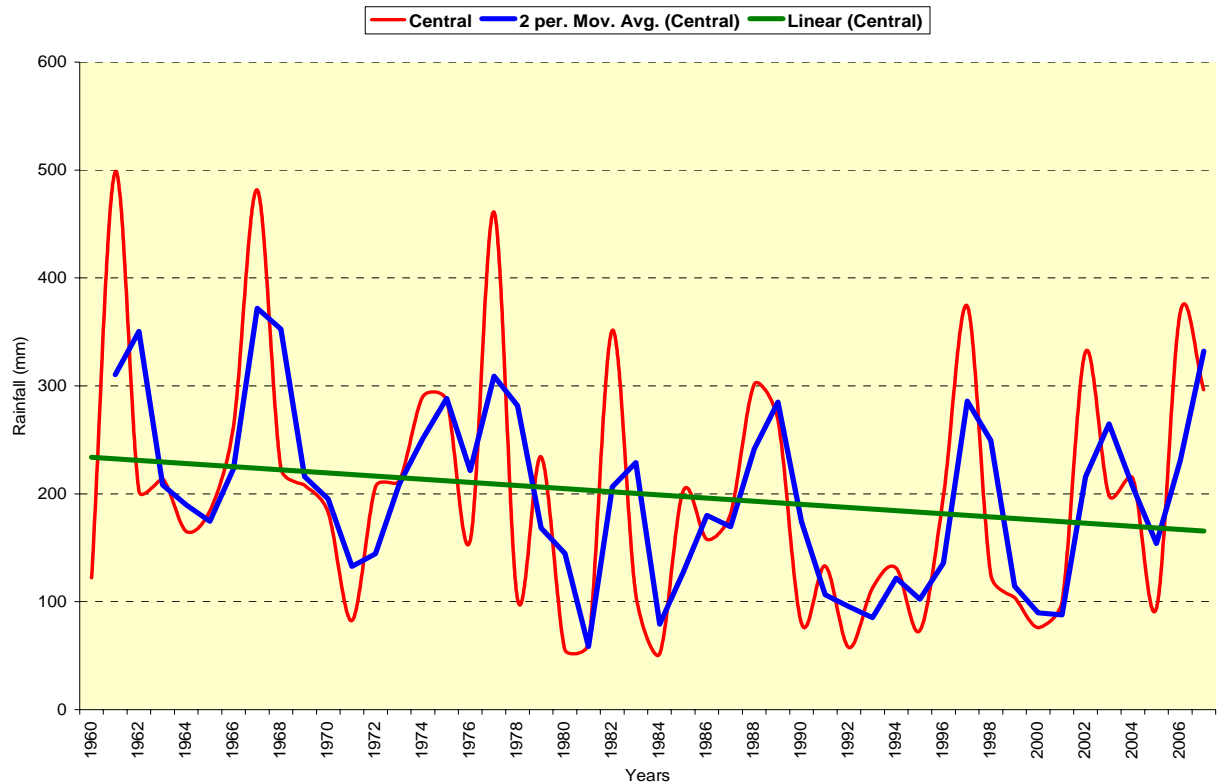


**Figure 27: The challenges facing goat rearing in the various regions**

### a) Droughts

Drought results because of predicted/unpredicted changes in the weather and rainfall patterns. It causes an increase in the distance to be traveled to the water, especially during the dry season. Droughts also lead to a gradual reduction in pasture availability and tree cropping and also affect the crop production and hence leads to a food shortage.

In Figure 28, the lowest rainfall seemed to occur every 10 years. With extrapolation, the next drought is therefore expected to occur in approximately 2010. The trend also showed the annual rainfall to be declining over time.



**Figure 28: The Annual rainfall in the Turkana district (1960-2006). (Meteorological Department, Lodwar Office, 2008)**

### **b) Rustling/Raids**

Raids and conflicts have been known to cause loss of life and property. Conflicts also leads to the degeneration of social relationships, and result in forced migration of households and their livestock. Conflicts originated in Turkana e.g. as a result of the small arms proliferation, weakened traditional governance systems and inappropriate development policies pursued by the government. As discussed by Juma et al. (2007), conflicts and insecurity have disrupted pastoralist movement and access to grazing and water resources. It has also inhibited access to markets for the sale of livestock and livestock products, as well as for obtaining livestock inputs (feeds, medicines, etc.)

### **d) Diseases**

Research has shown diseases to be the third most important constraint confronting goat rearing. Pastoralists and their livestock nomadic way of life implies that disease can be readily spread from one area of Turkana to the next.

Pastoralists generally live in remote areas where agricultural services are not available. Further more, pastoralists may be too poor to afford the services required. This therefore means that the pastoralists have less capacity to cope with or combat animal diseases. During the FGD (Focused Group Discussion), respondents pointed to various goat diseases that are prevalent in the Turkana district (Table 8).

Turkana pastoralists rely heavily on traditional medicinal remedies which provide affordable and readily available agents for certain goat diseases and conditions.

Table 8: Common goat diseases (Source: 8 FGD, IDI's)

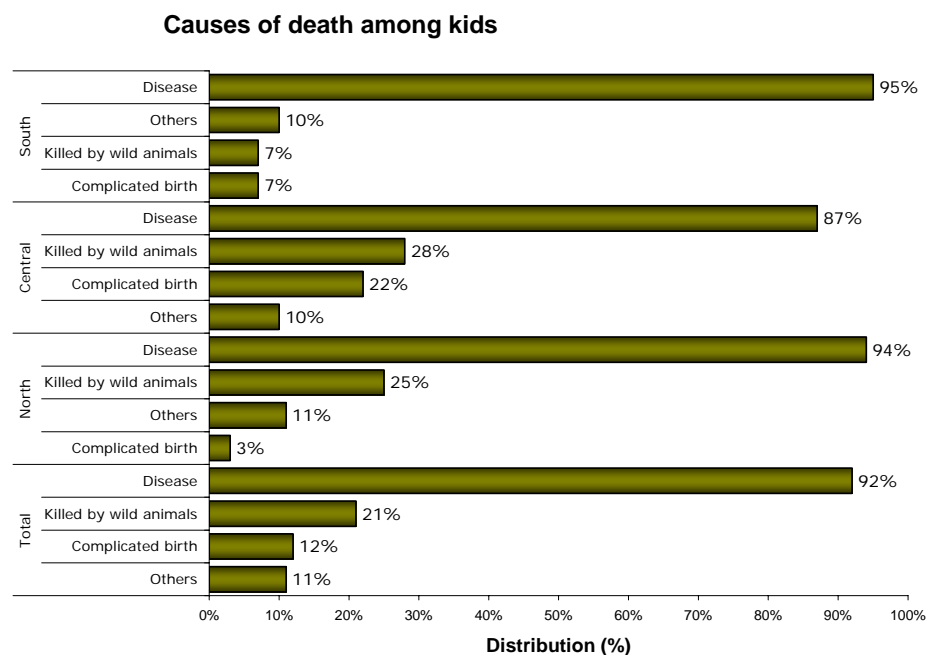
<i>Local Name</i>	<i>Common/ Scientific name</i>
<i>Lomoo</i>	<i>Peste des petits ruminats/ Goat plague</i>
<i>Etune</i>	Goat Pox
<i>Loper</i>	Goat Mange / ( <i>Psoroptic mange, sarcoptic mange, chorioptic mange and demodectic mange</i> )
<i>Naosin-loutokonyen</i>	Worms/internal parasites
<i>Ngiborwok</i>	Sore mount / Orf ( <i>Contagious Echyma, contagious pustular dermatitis</i> )
<i>Ngiritan/Ngipeelei</i>	Intestinal worm infestation , liver fluke and lung worm infestation /( <i>Helminthosis</i> or <i>Gastrointestinal nematodiasis</i> ),
<i>Lotebwo</i>	Bloat, Ascites (Fluid in the peritoneal cavity due to infection, worm infestation)
<i>Lookot</i>	<i>Haemorrhagic septicemia</i>
<i>Lonyang</i>	Anaplasmosis
<i>Enomokere</i>	Anthrax
<i>Lokit</i>	Swollen ears, Tick infestation/ <i>Psoroptic mange</i>
<i>Lokio</i>	Rinderpest
<i>Loukoi</i>	<i>Contagious Caprine pleuro-Pneumonia</i> (CCPP)
<i>Apid</i>	Bile, Babesiosis (Caused by <i>babesia ovis</i> and <i>Babesia motasi</i> )
<i>Ekichododu</i>	<i>Interdigital phlegmon</i>
<i>Lolingakori</i>	Tse tse flies (the intermediate hosts for Trypanosomes (that cause nagana)/ <i>hippobosca cameli</i>
<i>Elachit</i>	Lice/ <i>pediculosis</i>

It was clear from the FGD's and IDI's that the Turkana pastoralists were aware of the need to improve animal health practices, but agreed that they possess limited knowledge and some of the traditional beliefs did not benefit the welfare of the animals (Njanja et al., 2003).

### e) Predators

Poor management of goats generally leads to increased vulnerability to predators and deaths e.g. caused by hunger due to lack of supplementation. The main predators mentioned by the respondents during the FGD's were hyenas, jackals and wild dogs.

### 5.5.3 Causes of goat kid mortalities



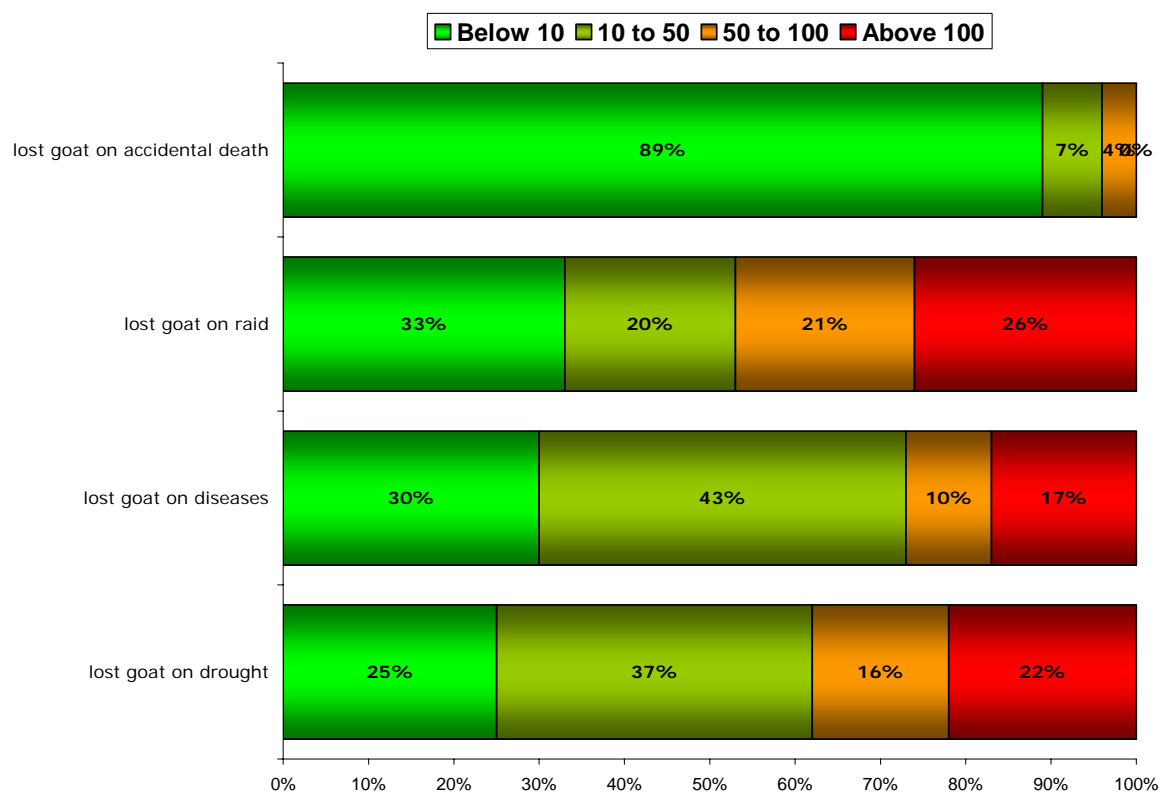
**Figure 29: The main causes of death among goat kids in the various regions of Turkana**

Figure 29 sets out the main causes of death among goat kids in the various regions of Turkana. The overall cause in all the regions indicate the major cause of deaths among goat kids to be diseases - which accounts for 92 % of the

mortalities. Death caused by wild animals was 21 %, while those caused by complicated births entailed 12 % .

In the Southern, Central and Northern regions, diseases were the main cause of deaths - which accounted for 95 %, 87 %, and 94 % respectively. Deaths as a result of being killed by wild animals in the Southern, Central and Northern regions, was 7 %, 28 %, and 25 % respectively.

### 5.5.4 Number of goats lost due to various causes



**Figure 30: The number of goats lost from other causes**

Figure 30 shows the average number of goats lost due to various causes. Goat losses due to accidental deaths with a herd size below 10 goats accounted for 89 % while those herds between 10 to 50 goats it accounted for 7 %. Goat losses due to raids with a goat herd size below 10 was 33 %, while those with herd sizes between 10 to 50 goats accounted for 20 %. Herds of 50 to 100 goats accounted for 21 % and those herds above 100 goats accounted for 26 %. Goat losses due to diseases with stock size below 10 goats, between 10 to 50 goats, 50 to 100 goats and above 100 goats accounts for 30 %, 43 %, 10 % and 17 %

respectively. Losses due to drought with stock size are below 10 goats, between 10 to 50 goats, 50 to 100 goats and above 100 goats, accounts for 25 %, 37 %, 16 % and 22 % respectively.

# CHAPTER SIX

## 6. DISCUSSION

The main livelihood of the Turkana pastoralists is livestock production. However, the Turkana pastoralists have diversified to other livelihoods such as fishing, crop production, small businesses and petty trading. It has however generally been accepted that the livestock numbers of the Turkana district have declined. The findings further indicate that, irrespective of the herd size, the motivators towards the rearing of goats still remains due to cultural rituals, provision of school fees, provision of money to maintain the family and the availability of water and pastures. Means of ploughing, drought relief, and the ease of management were the minor motivators. During the FGD, the respondents stated that the main factors to consider when deciding on which livestock to keep were security, the availability of pasture, water and labor.

### 6.1 THE EXTENT OF GOAT REARING AS A LIVELIHOOD STRATEGY IN THE TURKANA DISTRICT

#### 6.1.1 Animals farmed Across Regions

This research was intended to find out which type of the livestock was mostly reared and farmed by the Turkana pastoralists. From the findings, goats and sheep were found to be the most frequently reared livestock and these small stock were the most popular in all three regions of Turkana. The Northern region was the most popular for the rearing of goats, whilst the Northern region led in sheep rearing. One interesting finding was regarding poultry. This specie was predominantly kept in the Central region of Turkana. This can be explained by the fact that poultry are mostly kept by the urban residents, most of whom reside in the Turkana Central region.

The fact that goats and sheep were the most reared livestock can be explained by the many advantages of small stock, compared to larger livestock. The current research also found goats to be the most farmed livestock in Turkana. This finding was supported by a survey done by Rymer (2005), who found goats

to contribute about 30% of a goat-keeper's livelihood in the Turkana district. Goats have a faster reproductive rate than cattle and because of their shorter generation interval it is possible to generate a quicker return on invested capital. It has been recorded that due to the goat feeding behavior, they are less in competition with other ruminant species. Another advantage is that goats are a much more liquid asset (more easily converted) than cattle and goat sales have a strong relation to the paying of fees (Heffernan and Misturelli, 2000; Mtenga et al., 2002).

### **6.1.2 Animals reared and farmed according to gender of the head of the Household**

The findings indicate that the male, compared to female respondents mostly took charge in the rearing of all farm animals, with the exception of poultry and dogs. The latter two can be explained by the fact that both poultry and dogs are mostly found within the perimeter of the homestead. Interestingly, these findings indicated gender to be biased towards women in the ownership of livestock. These findings are supported by research conducted by Oluka et al (2004), who further reported men to be mostly involved in the marketing and herding of livestock, while the women and children are mostly the people involved in working with the animals. This work involves taking the animals to the pastures, milking and the preparation of dairy products.

### **6.1.3 Size of goat flocks across Regions the Turkana region**

Findings indicate that majority of the households keep a flock size of 20 to 50 goats. The Southern and the Northern regions generally keep a larger herd (50 to 100), compared to the Central area (20 to 50) goats. The Central region recorded a high percentage (51%) of households with a herd size of 20 to 50 goats. This can be explained by the fact that the Northern and Southern areas are neighbored by countries (Uganda and Sudan), with better pasture and water for livestock rearing. The Southern region recorded the highest number of households which farmed over 100 goats per household.

In many areas of Turkana, most goat herders have been forced to abandon their pastoral way of life because of the adverse climatic conditions. As stated by VSF-B (2005), pastoralists have to face new problems of droughts, raids, animal health, etc, which have forced them to reduce their herd size. In order to cope with this, most herd owners have had to separate their herds and have them herded into areas sometime up to several hundred kilometers apart. This is intended to be a measure against forage shortages and raiding. The herds are also separated in such a way that different members of the family, manage different herding units.

#### **6.1.4 Responsibilities in Goat Handling**

Overall, boys are in charge of looking after the grazing goats. This was found to be the most important responsibility in goat handling. Watering of animals by both the mothers and girls was the second most important activity, while this was followed by the milking by both the girls and servants. These findings indicate that labour distribution and the allocation of roles and responsibilities is very crucial in the handling of goats. Tasks are therefore segregated according to age, sex and the position in the household. Grazing, for example, indicates that a household with fewer boys may rely more on servants to take care of the grazing goats. Men are generally tasked with making strategic decisions concerning the household and make decisions on who is responsible for what activity, sometimes, after consultation with the wives. Women and girls are mostly tasked with the responsibility of milking and processing the milk and taking care of the young and sick goats.

#### **6.1.5 Marketing of Goats**

As the results of the survey indicate, most of the goats are sold from one individual to individual. Interestingly, the Central region is shown as having the largest number of respondents selling their goats at formal markets. The Southern and the Northern regions of Turkana are relatively similar in terms of using markets for selling of the goats. The other interesting finding was that in the Southern region, where goats sold at formal markets were more than those sold between individual herders. This finding can be explained by the fact that Turkana-South has a better infrastructure, compared to the other regions. The

herders in the Southern region can therefore transport their goats to urban centres within Kenya. Turkana-North was shown to have the largest number of goats sold to individuals. This can be explained by the fact that the goat owners sell to middlemen, who later take the goats to refugee camps in Kakuma or sell to NGO's in Lokichoggio or in Southern Sudan.

The findings further indicate that lack of access to livestock markets reduces the market value of livestock and hampers the ability of pastoralists to convert livestock assets into cash and other physical assets. As reported by Oluca et al. (2004), remoteness, poor infrastructure, lack of contact with livestock traders, insecurity, banditry, high government taxes, high transport costs and unofficial fee requests at check points, have restricted pastoralists' access to markets and worsened the situation. Other challenges to marketing have been recognized as low outputs and high input prices, few and distant markets for livestock, lack of good transport and poor storage facilities. Until the 1980's, Kenya sold its meat across the world, with markets in Europe and the Gulf. The government owned the Kenya Meat Commission (KMC), which provided transport to its abattoirs and reasonable prices, but currently, this does not seem to be the case.

During the FGD's, respondents were asked where they sold their goats when there was need. Most of the respondents mentioned the urban centres, the neighbouring countries and refugee camps. However, when asked why most households do not considerer goat-keeping as a business, they denied this by saying that all people who keep goats still sell them when need arises. These findings show that the marketing of goats was mainly subsistence oriented. There is therefore the need to improve the commercialization which was constrained by lack of markets. There is the need for a well established marketing system for efficient livestock production in Kenya.

## **6.2 LIVELIHOOD STRATEGIES AMONG THE TURKANA PASTORALISTS**

### **6.2.1 Livelihood occupations by the head of a household according to gender**

The study identified different livelihood options as indicated by the results obtained. During the study, respondents mentioned a number of livelihood activities they engage in. In the order of priority, these activities were identified as animal production, crop farming, business, salaried employment, fishing, hunting and bee-keeping. The findings also indicated livelihood occupations according gender. Results indicated compared to women, men were mostly owners of majority of the livelihood activities. Women were mostly involved in crop farming and business, while the men headed animal production, salaried employment, fishing and hunting.

These findings further clearly indicate that the respondents depended on animal production as a livelihood. Apart from crop farming and business, men generally controlled most of the livelihood activities. The results clearly highlight and define the gender divisions and are in agreement with Heffernan and Misturelli (2000), who found livestock keeping to contribute to most household incomes. This further implied that goat keeping remains of major importance to the livelihoods of most impoverished members of the Turkana community. The goat has continued and thus remains the major source of income.

### **6.2.2 Livelihood occupations across the regions of Turkana district**

As illustrated by the results, goat production is the main livelihood activity across the regions. This was mostly followed by crop production in the Northern and Southern regions. Interestingly, business and fishing were the other most important livelihoods in the Central region. This can be explained by the various numbers of urban centres and the presence of Lake Turkana, respectively. Crop farming is practiced in both the Northern and Southern region and is mainly along the rivers of the Turkwel river (Central and Southern regions), River Kerio (Southern region) and River Omo (Northern region).

### **6.2.3 Expenditure of income earned from goats**

From the results generated, it is evident that a higher percentage of the goat earnings were utilized in the purchasing of food for household consumption. This was followed by medical care, school fees and dowry - in that order. These findings are in agreement with Heffernan and Misturelli (2000) for studies conducted in Northern Kenya, during the dry season, when a drought was prevalent. This may also have influenced the thinking of the respondents. Marriages were also not conducted in the dry season, hence the lesser importance given to dowry as a reason for the sale of goats.

### **6.2.4 Income earnings from various occupations**

Income from the sale of a goat was generally below 1000 Kshs. This can be explained by the fact that goats are normally only sold in cases of emergency and to cater for the immediate needs of the family. It also agrees with the fact that most respondents preferred to sell a goat every month. Salaried employment and income earned from other animals brought the income of above 10000 Kshs as most of the respondents from the Northern region were where most international non-Governmental organizations operated from.

## **6.3 GOAT REARING AS A LIVELIHOOD STRATEGY OF THE TURKANA PASTORALISTS**

### **6.3.1 Goat acquiring Process**

In order to evaluate the goat acquisition process, a questionnaire was utilized. The respondents were asked to state how they obtained the goats they currently possessed. The results showed that of the households (62%) who participated in the study had purchased the goats in their possession. Others acquired the goats through inheritance, kinship, dowry and raids and only 2% acquired goats as gifts, exchanges or loans.

During focus group discussions (FGD's), the respondents stated that for goat herd building, they sold bigger animals (cattle, camels, etc) in order to purchase

goats. In Turkana, the father divides his goat herd according to the number of wives. The children of the respective wives automatically inherit the animals when the father dies. Kinship is in the form of gifts given to relatives and the goats may also be acquired in the form of dowry (*lobola*) e.g. when a daughter is married, the father and the immediate relatives (brother and sister to the father and mother, uncles and aunts, etc) receive their part of the goats. From the information generated the raids is a very small means of acquiring goats.

The findings are similar to that of Heffernan and Misturelli (2001), studying the acquisition of livestock by pastoralists in Northern Kenya. This also agrees with the information of Aemun (2006), who stated livestock to be borrowed for goat herd building or merely donated in expectation of favors from those within the family network.

### **6.3.2 The acquisition of goats in different regions of Turkana**

When the goat acquiring process was tabulated according to the three regions, the findings seemed a bit different. Goats were acquired mainly through inheritance in the Northern and Southern regions of Turkana. Interestingly, in the Central area, goats were mostly acquired through purchase. These finding can be explained by the fact that the Turkana Central region has more urban business centres, compared to the other two regions. In the Central region, the respondents could sell their larger livestock in order to purchase the smaller stock (e.g. goats). There was also the possibility of respondents engaging in business and some form of employment, in order to generate cash to purchase the goats.

Goats were acquired more through raids in the Northern and Southern regions, compared to the Central region. This can be explained by the fact that Northern and Southern regions are neighbored by tribes which raid the Turkana. These tribes include the Pokot in Kenya, Toposa in Sudan and Merille in Ethiopia. However, the Karamoja tribes from Uganda also raided the Central region of Turkana, but livestock raiding here seems to be minimal compared to the other regions.

### **6.3.3 Utilization of Goats Products**

In order to determine how various goat products were utilized by the members of the household, the respondents were asked to state how they distributed these products. As illustrated, mothers made the main decisions on utilization of the milk and skins (products), while the fathers again made the decisions on the utilization of the live goat as a livestock asset.

In Turkana, the women and children are mostly the people involved in working with the goats. This involves taking the goats to pastures, milking and the processing of dairy products. Men on the other hand are more involved in herding and make decisions regarding goat keeping, sometimes after consultation with their wives. According to Degen (2006), men are generally responsible for the buying and selling of the goats. Women have limited rights over the ownership and the control of the goats. This implied that a gender bias against women existed in the ownership of stock (Hargreaves, 2002). The pastoralists derive more than 50% of their total nutrient consumption from livestock in the form of meat and milk. In this study, respondents were also asked to share information on how they utilized the various goat products.

During a focus group discussion in Northern Turkana (Lokitaung), one of the female respondents when asked which goat product she preferred (meat or milk), she stated the following:-

*“Milk can stay edible for a long period of time and can support several visitors. It can be in the morning and evening. Milk can also be sold to get sugar or tobacco. You can also get oil from milk. A person cannot eat meat on a daily basis,”*

### **6.3.4 The Frequency of selling goat Products**

The results indicate that, the majority of the goats were mostly sold on a monthly basis. Very few were sold after longer periods (6 months) of time. This finding suggests shows that the goat sales are related to the seasons. The Turkana pastoralists prefer to sell their goats near the end of the rainy season

this is when they fetch the highest prices. The time of selling is related to the fact that in cases of economic crises, goats can easily be sold because of their affordability to many people. A goat is thus an easily liquidated resource that can be used for saving or raising cash. For pastoralists, goats serve like a bank account which can be drawn upon when cash is needed. The offspring are the interest earned (Jansen and Van Den Burg, 2004).

### **6.3.5 Motivation towards selling of goats in the different regions of Turkana**

The purchase of food was generally the main reason which motivated households to sell their goats. This was followed by medical care, education and drought. It is however interesting to note that this priority order was same in all regions. Nevertheless, Central region seems to have the greatest need compared to two other constituencies. The Turkana North area seems to have the least need for the motivation of selling goats. This is an interesting finding, as it agrees with the Kenya Government report on the ranking of parliamentary constituencies according to poverty indices<sup>2</sup>. The motivation to sell goats due to a drought was least significant due to the fact that the goat is a hardy animal, and can withstand drought situations.

## **6.4 GOAT REARING AS A SUSTAINABLE LIVELIHOOD STRATEGY AMONG THE TURKANA PASTORALISTS**

### **6.4.1 Survival Rates of Goat Kids**

Overall, the survival rate among male kids was higher than that in female kids. The highest goat kid survival rate was recorded in the Central region, followed by South and North respectively. It was of interest to note that no literature was available which supported these differences in survival rates between the sex of the goat kids. However, it is worth knowing that pastoralists raise kids for replacement stock, to be sold as breeding stock, or to be slaughtered for meat. This therefore emphasizes that the household must raise healthy and productive kids (Coffey et al., 2004).

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<sup>2</sup> Daily Nation Newspaper, page 1, 29<sup>th</sup> August, 2008.

The goat dam is very well capable of caring for her new born kids and if the birth happens without a problem, then the kids can already start grazing with the herd a day after the birth (Jansen and Van Den Burg, 2004). Goats are then able to take care of the kids until they are sexually mature. The better the care, the greater the number of animals of good quality goats which will reach maturity. In Turkana, if more kids mature, a person can sell, slaughter or dispose of more goats – which has financial implications. Goats reproduce more readily and being of lower asset value, a loss through disease or poor nutrition is easier to handle and cope with than the loss of larger stock e.g. cattle (Ahuya et al., 2006).

#### **6.4.2 Goat Breeds reared In Turkana**

According to Coffey et al. (2002), there are approximately 200 different breeds of goats in Kenya. These include the East African (found predominantly south of the equator) and the Galla breed (which occurs mainly in the northern regions). In a study by Ahuya et al. (2005), exotic dairy meat goats were imported into Kenya starting in the 1950's, and more rigorously in the 1970's and early 1980's. The Kenya Ministry of Livestock and Fishery development estimates the two main goat breeds make up 10 million head. Currently, the majority of the exotic goat breeds in Kenya are the German (Kenyan) Alpine, Toggenburg, Anglo-Nubian, Saanen and Boer goat. The national population of exotic goats and their crosses compared to the indigenous goats are estimated to be 90826. Cross breeding has become the most common strategy for dairy goat improvement, and has been performed in the East Africa region for some time, with many exotic temperate and local breeds being involved (Ahuya et al., 2001). Goat productivity (milk and meat) can be increased by the introduction of these new breeds with different characteristics.

During the FGD's, respondents affirmed that some goat breeds introduced into the district have been accepted. This suggests their willingness to diversify and improve the goat breeds. The respondents believed that exotic breeds could

produce more animal protein (milk and meat), but were less resistant to diseases and the harsh environments.

### **6.4.3 Intention to pursue other Livelihood occupations**

From the data (Figure 22) it is evident that the majority of the respondents (87%) confirmed wanting to pursue other livelihood strategies. Only 13% stated they will only rear goats. The group that preferred to pursue livestock as a livelihood strategy was the majority (Figure 9), followed by fishing, business, salaried employment, hunting and crop farming respectively. This can be explained by the fact that, pastoralists prefer to diversify their goat herds as a mechanism of coping with challenges, such as drought.

During a FGD when asked to mention the kind of animals the respondents preferred other than the goat, one of the respondents made the following statement:

*"I like sheep and donkey. Once you get goats, other animals can also be acquired...donkeys can then be added for transportation. A man is considered rich when he has both goats and any other types of livestock"*

### **6.4.4 Grazing Areas for Goats in Turkana**

The major grazing area for goats in Turkana are the river banks (68 %), with 67 % accounting for grazing in the mountains/hills, 63 % on the flat lands and 6 % at the shores of the lakes ( Figure 25).

### **6.4.5 Grazing Patterns of Goats**

The majority of the respondents claim that they move with their goats more than twice (32%). This shows that the majority of the pastoralists are mobile or nomadic in nature. The common future to all pastoral groups is the use of communal grazing land and their mobility - this allows them to respond to variations in rangeland conditions, water availability and insecurity. The degree

of their mobility varies in response to environmental factors, and is not restricted by international boundaries. The pastoralists follow a seasonal grazing pattern that ensures that all livestock herds have access to forage and water throughout the year. Pastoralists also have certain reserved areas for goat grazing during the dry season.

In Turkana, the ability to access, control or make use of the natural resources like water/pasture is limited by rules and social norms. With such regulations in place, the people value the resources and use them sustainably (Omosa, 2005). Access is clearly understood to be part of a reciprocal agreement, where the digging, use and maintenance of water wells are governed by an elaborate system of customary or traditional rules. Conflicts may arise when there is no proper governance and people use unorthodox means to access water for their livestock. Traditionally, each household has a section of trees along seasonal streams (*ekwar*), which served as a buffer feed option during the periods of drought (Aemun, 2006).

As the climate change intensifies, people move further away from their traditional grazing routes and on to other people's lands. They move longer distances in search of pastures and water and in due time, they meet other hostile tribes, and conflicts ensue.

During a FGD, the respondents explained the seasonal movement of their goats both during the dry and wet seasons. It was said that the goats are grazed along the river banks during the dry season and then moved to the mountainous areas during the rainy season. They also stated that there are no definite boundaries when it came to the grazing of the animals. For goats, the respondents stated that, they are known to eat almost anything, including plastic and paper.

## **6.5 Various stresses and constraints to goat production among the Turkana community**

Conroy and Rangnekar (2000) found similar constraints to the survey related to goat production. It is evident that during a drought or famine, the lack of feed

and pasture are the main challenges to the rearing of the goats. The second challenge to goat rearing is raids or insecurity. In the third place, diseases and infertility are a real constraint in goat production. The last constraint is predators. It was interesting to note that marketing did not feature as one of the main challenges mentioned by the respondents.

### **6.5.1 Challenges to goat rearing**

Droughts originate as a result of the unpredicted changes in weather and rainfall patterns. These droughts increase the distance that people have to walk in order to fetch water and also leads to the gradual reduction in the quality of the pasture and tree crops. Drought also affects the crop production and hence leads to a general food shortage to the people.

Livestock raids and conflicts have been long known to cause loss of life and property and these conflicts also lead to a degeneration in the social relationships, and forced migration of households and their livestock. The tribal conflicts among the pastoralist communities have been fueled by the small arms proliferation, weakened traditional governance systems and inappropriate development policies pursued by government. Juma et al. (2007) reported conflicts and insecurity to disrupt pastoralist movement and access to grazing and water resources. It also inhibits access to markets for the sale of livestock and livestock products, as well as the purchasing of livestock inputs.

Research has shown livestock diseases to be the third biggest constraint to goat rearing in the rural areas. Pastoralists and their nomadic way of life implies that disease can be spread from one area to the next. Frequently pastoralists live in the remote rural areas, where services are not available and are generally too poor to afford the services required. This therefore means that the pastoralists have little or no capacity to cope with animal diseases.

It was clear from the FGD's that the pastoralists were aware of the need to improve animal health practices, but agreed that they had limited knowledge and some of their traditional beliefs did not allow them to benefit the animals.

Poor management of goats also leads to vulnerability to predators and deaths caused by hunger due to the lack of supplementation. The main predators mentioned by the respondents during the FGD were hyenas, jackals, wild dogs, etc

### **6.5.2 Number of goats lost due to various causes**

A large number of goats (above 100) are mainly lost due to raids, drought and diseases respectively. Smaller losses in goat herd numbers (below 10) are mainly lost due to accidental deaths or unforeseen circumstances.

## **CHAPTER SEVEN**

### **7. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **7.1 SUMMARY**

Goat rearing remains the cornerstone of livelihood of the Turkana pastoralists, and the majority of the people depend on the goat. Hence future agricultural development should be based on improving their knowledge on goat rearing as a livelihood strategy. This study attempted to determine whether goat rearing is a sustainable livelihood strategy of the Turkana pastoralists and was undertaken between January, 2008 and July, 2008 and utilized several rural appraisal methods, and was based on both primary and secondary data.

In all the regions of Turkana the most kept domestic animals are goats, followed by sheep, camels, donkeys, cattle, and poultry. The head of the household is the male and accounts for the highest proportion of involvement in the rearing and production of goats, sheep, camels, donkeys, and cattle when compared to the female as the head of the household. In another study, it was found that the women as head of the household were the people found to have the highest involvement in the rearing of poultry and dogs (Heffernan, 2004). For all regions in Turkana, it was evident that the herd size of goats between 20 to 50 animals was the most frequent in households (38 %) - followed by 50 to 100 goats (30 %). Households with herd sizes of over 100 goats and below 20 goats were only found in 16 % of the households. In the coverage for all the regions of Turkana, the individual market was the main means of marketing in the households (67 %), while the common market was utilized in 63 % of the cases. The results generated also revealed several factors towards goat rearing as a livelihood occupation. The main reason for preferring the rearing of goats was that these animals provided readily available money to maintain family needs, which was the case for 99 % of the households. The other reason was that goats provided money for school fees (as mentioned by 86 % of households), while the animals were used as a means of ploughing by 3 % of households.

The study recorded that there were several livelihood options that the Turkana pastoralists rely on. In all the regions, goat production had the highest popularity frequency as indicated by 97%, 94 % and 88 % of households in North, Central and South regions, respectively. It was also found that these goats were acquired through various means, with 59% being acquired through inheritance, 51 % through kinship, while 50 % and 11% were acquired through dowry and raids respectively. Other information generated showed that the mothers of the household are the ones who make the most independent decisions regarding milk and skin (74% and 65% respectively). The father of the household makes the most independent decisions regarding the goat at 64 %, while the mothers also make independent decisions on the meat and blood consumption.

The data generated also showed the frequency of pastoralists selling goats for cash. The frequency of selling goat products on a monthly basis was 70 %, on a 3 month basis 23 % and on a 6 month basis, 7 %. In terms of the motivation why to sell goats, the overall reason was that the highest motivation toward selling of goats in all regions was to buy food (94 %), followed by medical care (77 %). Education and drought were responsible for 72 % and 36 % of the reasons respectively for selling animals. Of the income generated from goats, 93% of the income was spent on food, medical expenses, school fees and dowry (80 %, 71% and 29 % respectively). When compared, the income earned from goat 57 % was below 1000 Kshs, while 41 % was between 1000 and 5000 Kshs.

Survival rates among the goat kids by gender were also recorded. The overall survey shows that in all regions the survival rates among goats was 73 % for males, while 67 % of the females survived and the overall survival rate was 70 %. Various factors that motivate a person to livestock keeping as a livelihood occupation and herd size were also investigated. For a person to rear over 100 goats the main motivation was for the utilization of activities such as cultural rituals, providing school fees, and proving money to maintain the family. Minor reasons such as the goat being drought resistant, quick to multiply, easy to manage, there being more readily available pastures available and it being less labor intensive, less prone to theft and the buying prices being affordable were seen as contributing factors.

In the survey, 59% of the livelihood strategies related to livestock production, 38 % to fishing , 31 % was represented by those who wanted to pursue business, 21 % for those who want to pursue salaried employment, 17% for those who wanted a hunting livelihood, while 14% accounted for crop farming as a livelihood. For the Turkana pastoralists, 99% farmed with the local goat breeds and only 1% farm with cross-breeds.

In this survey, several challenges facing goat rearing from the various regions of Turkana were identified. In the Southern and Central regions the major challenges were ranked the same for drought or famine, lack of food and pastures (86% and 83 % respectively). In the Northern region, the major challenge was raids, insecurity, rustling and theft accounting for 96% of the problems.

The study has illustrated the main causes of deaths among goat kids in the various regions of Turkana. The average indicated that the major cause of deaths among goat kids to be diseases (92%), death caused by wild animals (21%), while those deaths caused by difficult births was responsible for 12% .

Goats were lost due to various causes. The loss of goats due to accidental deaths in herd sizes below 10 goats accounted for 89 % of the causes. Those with herds of between 10 to 50 goats accounted for 7%.

Overall, the fields that required assistance to improve goat production included aspects such as restocking and loans, which had the highest need (59%). For food relief and animal pastures the need was 47%.

To summarize, goat rearing is the major livelihood strategy in the Turkana district. If goat rearing is to be the engine of fighting poverty in Turkana, Kenya, efforts and support need to be based on local perceptions, needs and the goat rearing knowledge of communities.

## 7.2 CONCLUSIONS

From the study, the following conclusions could be made:

The main livelihood of the Turkana pastoralists is livestock production. Other livelihoods include fishing, crop farming, business, salaried employment and hunting. The Turkana communities rely on livestock as the main livelihood strategy, with goats being the main type of livestock which the Turkana pastoralists believe in. The main reason for rearing goats as a livelihood occupation for the Turkana pastoralists is that goats provided an income to maintain the household - hence being the main source of income for the Turkana households. Other reasons for goat production were that they provided money for school fees, were used to pay the medical bills, were easy to manage, etc. There are thus several reasons for the keeping of goats, including activities such as paying for cultural rituals, paying for school fees, food, being easy to manage, availability of labor to handle goats and pasture and water availability. Turkana pastoralists mainly kept the local breeds and a very small percentage farmed with exotic breeds - which come mainly from the North-Eastern Province (Kenya).

Turkana pastoralists mostly acquire their goats through inheritance. Other means of acquiring goats in order of priority include kinship, dowry, raids and gifts. Most of the goats are sold individually (household to household), other than through organized markets. Most of the goats are then sold on a monthly basis. Turkana pastoralists also spent most of the income derived from goats on food. Other uses were medical care, school fees and dowry.

The men owned the livestock, and made most of the decisions relating to the management of the livestock. Women were more involved in decision making of small stock, compared to the larger animals. Mothers of the households are the persons who make the most independent decisions, especially on use of the milk, meat, blood and skins. The fathers (males) of the household made most decisions on the use of the goat e.g. sales, gifts, etc.

The main challenge facing the Turkana pastoralists in their bid to rear goats was drought or famine. Other challenges included insecurity or raids, diseases, theft or predators. The main cause of deaths in goat kids was diseases. The other causes identified were wild animals/predators or difficult births. The survival rate of male kids was higher than that of the female kids. The respondents identified areas that required assistance in order to improve goat production efficiency. The main shortcoming was the provision of loans. The other areas mentioned were food relief, pastures, animal health, cross-breeding, vaccinations, security and insurance.

The aim was to possibly show the importance of goat rearing as a sustainable livelihood strategy of Turkana pastoralists. Finally, it is hoped that, this study contributes to an improved understanding of the role of goats in Kenya, and even moreso in the arid and semi-arid lands. It is suggested that this study be further researched with emphasis on:

- The relationship between nomadic pastoralism as a livelihood and HIV/AIDs
- Proliferation of small arms and other light weapons in the Turkana district.
- Causes and the impact of conflict between pastoralists and cultivators.
- The coping strategies and the effects of cattle rustling on the livelihoods of the pastoralists.

### **7.3 RECOMMENDATIONS**

From this survey, a number of recommendations have been highlighted. These are include:

- Profitable markets, where pastoralists can sell their goats and goat products should be identified. The government must assist both pastoralists and consumers access to markets. This will increase the market strength of the pastoralists at the expense of the middlemen. It will also provide an opportunity to the pastoralists to generate more income, and hence improve their livelihoods.

- Accessibility of markets to the pastoralists: Marketing can also be improved if the government improved road networks with the neighboring countries - Uganda, Ethiopia and Sudan. The road network can also be improved between Turkana and other districts of West Pokot, Marakwet, Baringo or Samburu. The revival of the Kenya Meat Commission (KMC) in June 2006, was one of the initiatives the government has undertaken, which can be further expanded. The government can also assist the pastoralists in acquiring rights to unhindered passage across international borders.
  
- The government and humanitarian agencies in the Turkana district should involve the local people in the design of development interventions such as restocking. The government can do this by ensuring that the pastoralists are involved in policy making processes so as to generate relevant and practical policies. The Government/NGO's should also adopt a participatory approach in introducing new technologies. The group approach plays a key role in problem solving and fund generation.
  
- The government and other development agencies should focus on ASAL and pastoralists as one way of helping these people out of the perpetual conflicts and poverty in which they live. The Government can assist the pastoralists in curbing raids to allow livestock access to dry season grazing areas and prevent livestock diseases. Security can then be improved in order for the pastoralists to access the vast rangeland resources.
  
- The government needs to establish a number of abattoirs or processing plants close to production areas and in various towns to broaden the market as well as providing improved goat meat market access to pastoralists. Abattoirs, livestock markets and roads, are required so that the animals can be bought and sold. Abattoirs provide an opportunity for producers to directly supply animals for export.
  
- International development community needs to recognize that pastoral livestock management in arid areas is productive, rational, and essential way to utilize scarce natural resources.

- There is need for the government and humanitarian agencies to establish, empower and support traditional decision making structures at the livestock community level - so as to strengthen livestock management practices among pastoralists. The government can also strengthen community preparedness systems through effective disaster management approaches, cross border peace initiatives, range management and appropriate and timely livestock restocking. Pastoral strategies of herd diversity, pastoral mobility and residential flexibility offer a means of convert patchy, seasonal, and scarce vegetation into calories and protein for human consumption in the arid and marginal lands.
  
- The Government must ensure that the pastoralists have better access to credit facilities and institutions to improve animal husbandry, purchase veterinary medicine, and improve water sources through low-cost dams and catchments.
  
- Settling of pastoral communities through the provision of permanent watering or construction of wells and boreholes to reduce the long distances to be traveled to fetch water especially during the dry season.
  
- There is need for the Government to improved animal health through community-based approaches, livestock marketing initiatives, conflict resolution, improving a system for equitable access to scarce resources, particularly access to grazing land and water, etc. There is also a need to control livestock diseases, by ensuring that there are free or subsidized drugs for emergency to minimize the effects of disease outbreaks. Technical assistance could also be provided through the formation and monitoring of the routine activities of the veterinarians and para-veterinarians (meat inspection, clinical examination and laboratory diagnostics). The veterinary services should pursue animal health control and promote a correct animal management programme.
  
- Frontline extension officers need to have a thorough training in goat husbandry, as they are generally ignorant, given the superficial coverage of goat production offered at the agricultural colleges from which such persons

graduate. Pastoralists are illiterate and the extension officers need to simplify the information without diluting the meaning. More practical demonstrations with animals are required, with health care practices supported by the use of pictures and photographs. It is useful to translate the information into national or local languages for them to be effective. There is the need to include institutionalization and recognition of local pastoralist technical support institutions such as CAHW's (Community Animal Health Workers). Ensure that the CAHWs are readily accessible, affordable and offer multiple services (disease outbreaks, market information, performance and pedigree records, advice on general husbandry practices, etc)

- Promote and encourage other alternative sources of food that supplement that of livestock production rather than those that tend to replace it. Agro-pastoralists (*ngiketak*) should be encouraged to produce more food so that the mobile livestock keepers can exchange livestock with grain as has been the tradition. There is a need to encourage and promote the utilization of local available food resources, e.g. the gathering of edible wild fruits which compliment livestock herding and support agro-pastoralists to produce more food. Thus the transient livestock keepers can barter with livestock.
- Research needs to support the intensification of goat rearing, but also needs to support sustainable livestock livelihoods from consumption to natural resource management. Policy, research and development needs and issues, especially those relating to the small ruminant sector are better highlighted and discussed when the farmers themselves actively participate. This participation ensures the inclusion of their views and concerns in the national policy agenda
- There should be a massive investment in the Turkana region to alleviate the impacts of climate change, with a special focus on reducing desertification in the semi arid areas of the Turkana district, where people strongly depend on goats for survival. International funds for more efficient goat production must be increased urgently.

- The animal's genetic potential has to be matched to the prevailing or anticipated production environment as closely as possible. There is need to ensure that the required breeds are available (for cross-breeding), and that available prices are affordable and sustainable.

## 8. REFERENCES

- Abebe, D., 2005. Contribution of Livestock Development to Poverty Reduction in Pastoral Areas of The Horn of Africa: Tropicultura: 10th Anniversary, VSF-Belgium
- Aemun, P.E., 2006. Re-evaluation of Drought Early Warning System (EWS) Time-series Data and the Role of Indigenous Knowledge for Drought Management in Turkana District, Kenya. Masters Thesis, Norwegian University of Life Sciences, Department of International Environment and Development Studies (NORAGRIC)
- Ahuya, C.O., Okeyo A.M., Ssewanyana E., Msanga Y. N, Mtenga L.A and Mosi R.O., 2006. Consortium Project on: Community Based Goat breeding and Improvement. Department of Animal Health, University Of Nairobi.
- Ahuya, C. O, Matiri, F. M, and Okeyo, A .M., 2001. Community based Goat productivity Improvement in central and south Meru districts: (1) Characterization of farm resource and capacities for keeping local goats or different grades of crossbred goats. Paper presented at BSAS International conference in Merida, Mexico.
- Ahuya, C.O., Okeyo, A.M., Kitalyi, A., Mutia, P., Murithi, F.M., 2003. Farm-Africa dairy goat and animal healthcare project: a successful case of agricultural research and sustainable development partnership.
- Ahuya, C.O., Okeyo, A.M., Mwangi-Njuru, Peacock, C., 2005. Development challenges and opportunities in the goat industry: The Kenya experience. Small Rumin.Res. 60, 197-206
- Akabwai, D.M.O, 1992. Extension and livestock development: Experience from among the Turkana pastoralists of Kenya. Pastoral Development Network Paper 33b. Overseas Development Institute: London.
- Carney, D., 1998. Sustainable Rural Livelihoods: What contribution can We make. DFID, London.
- Catley, A., Aklilu Y. and Admassu B., 2007. Introduction: Livelihoods Based Relief Interventions in Pastoralist Areas. (IIED (International Institute for Environment and Development), London, UK
- Catley, A., 1999. Methods on the move: a review of veterinary uses of participatory approaches and methods focusing on experiences in dryland Africa, (IIED (International Institute for Environment and Development), London, UK)
- Chambers, R., 1987, 'Sustainable livelihoods, environment and development: putting poor rural people first', IDS Discussion Paper 240, Brighton: IDS  
\_\_\_ 1989, 'Vulnerability, coping and policy', IDS Bulletin 20(2): 1-8  
\_\_\_ 1995, 'Poverty and livelihoods: whose reality counts?', IDS Discussion Paper 347, , Brighton: IDS

- \_\_\_ 1997, 'Responsible well-being – a personal agenda for development', World Development, 25: 1743- 1745
- Christian Aid., 2000: Livestock on the edge of climate change; the plight of pastoralists in Northern Kenya  
(<http://www.reliefweb.int/rw/RWB.NSF/db900SID/ACOS-64BGLF?OpenDocument>)
- Coffey, L., Hale M., & Wells A., 2004. *Goat: Sustainable Production Overview, National Centre For Appropriate Technology, United States Department of Agriculture. pp 1-24*
- Cohen, L. and Manion, L. 1998. Research Methods in Education, 4<sup>th</sup> edition, London: Routeledge Limited
- Conroy, C. and Rangnekar D. V. 2000. Constraints facing goat keepers in semi-arid India. Proceedings, 7th International Conference on Goats, Tome II.
- Conroy, C. and Rangnekar D.V, 2000. Constraints Facing Goat-Keeper in Semi-Arid India; Summary and Discussion
- Cooper, D. J., 1996, *Internal Marketing: Your Companies' Next Stage of Growth*, New York, the Harsworth press Inc.
- Cullis, A., Mekonnen G., Abebe D., Gebrechristos Y., Aklilu Y, Catley A., 2007. Case study: Livelihoods Impact of Commercial de-stocking relief intervention in Moyale Woreda, Oromia Region. Save the Children US, Addis Ababa, Ethiopia
- Davies, S., 1996, *Adaptable Livelihoods. Coping with Food Insecurity in the Malian Sahel* London: MacMillan press
- Degen, A.A., 2006. Sheep and Goats Milk In Pastoral Societies. Desert Animal Adaptations and Husbandry -Wyler Department of Dryland Agriculture
- Delgado, CM, Rosegrant, H, Steinfeld, Ehui, S and Courbois, C., 1999. Livestock To 2020. The next food revolution. Food, Agriculture and the Environment Discussion Paper 28. IFPRI. Washington DC. USA.
- DFID., 2000. Livelihood Outcomes. Sustainable Livelihoods Guidance Sheets, no. 2.6. <http://www.livelihoods.org>
- DFID., 2000b. *Halving World Poverty by 2015, Economic Growth, Equity And Security. Strategies For Achieving The International Development Targets. DFID Strategy Paper. [www.dfid.gov.uk/public/what/pdf/tsp\\_economic.pdf](http://www.dfid.gov.uk/public/what/pdf/tsp_economic.pdf)*
- Els, H.C. and Ramsay K.A., 1992. Breeding a Hardy Milk Goat Composite for Household Food Production and Security Using Saanen and Kalahari Red Goats and as A Basis. Depatment of Production Animal Studies, Faculty of Veterinary Sciences, University of Pretoria.

- Emory, W., 1985. *Business Research Methods*, 3<sup>rd</sup> edition, Illinois: Irwin Series in information and decision sciences.
- Esenu, B., Ossiya S., Serunkuma D., Oluka J., Aliu D., Owesigire B., Ebiyau G. and Olokojo B., 2005. *Positioning Agro-Pastoral Women in Livestock-production: The Link Between Socio-Economic Factors and Improved Household Food Security*. Tropicultura: 10<sup>th</sup> Anniversary, VSF-Belgium
- FAO., 2001. *Food Security Analysis Unit. Pastoralists Under pressure*.
- Fratkin, E. and Mearns R., 2003. *Sustainability and Pastoral Livelihoods: Lessons from East African Maasai and Mongolia*
- Fry, P.H and McCabe, 1986. *A comparison of Two survey Methods on Pastoral Turkana Migration Patterns and the Implications for development planning*
- Fuller, R., 2003. *Livestock and the Livelihoods of the Urban Poor: a background document*. Livestock Development Group, University of Reading, UK. 76 pp.
- Gay, L., 1996. *Educational Research: Competence for analysis and applications*, 5<sup>th</sup> edition., Maryland Imprint of Prentice Hall, New Jersey.
- Giddens, J. F. *Clinical Teaching for Nursing Education*. New Mexico State University. May, 2004.
- GOK., 2001. *The 1999 Population And Housing Census: Population distribution by administrative Areas And Urban Centres, Volume 1*
- GOK., 2004. *The National Policy For The Sustainable Development of Arid and Semi- Arid Lands Sustainable Policy*
- GOK., 2007. *Turkana District development Plan, 2002-2010*, Ministry of Planning & Natural Development
- Grant, R.M, 2000. *Contemporary Strategy Analysis: Concepts, Techniques, Applications (5<sup>th</sup> Edition)*.
- Hargreaves, J. 2002. *Livelihood Aspects Of The Household Environment And The sexual Behaviour And Risk Of HIV Infection Of Unmarried Adolescents and young Adults In Rural South Africa*. Unpublished PHD thesis, London School of Hygiene and Tropical Medicine
- Heffernan, C., 2004. *Livestock and the Poor: Issues in Poverty-Focused Livestock Development*. Veterinary Epidemiology and Economics Research Unit, University of Reading
- Heffernan, C. and Misturelli, F., 2000. *The Delivery of veterinary services to the poor: Findings from Kenya*. Report for the DFID Animal Health, University of Edinburgh.

- Heffernan, C., Misturelli, F. and Nielsen, L., 2001. Restocking and poverty alleviation: Perceptions and realities of livestock keeping among poor pastoralists in Kenya. Report for DFID's Livestock Production, NRI, Greenwich.
- Hesse, C. and McGregor J., 2006. Pastoralism: Drylands' Invisible Assets: In Developing a Framework for Assessing The Value of Pastoralism in East Africa. IIED issue paper 142.
- Hooft, K.V. and Wanyama J., 2005. Supporting Endogenous Livestock Development (ELD): An Alternative Vision of Livestock Development For The Poor. In *Tropicultura*
- ILRI., 2000. ILRI Strategy to 2010: Making the Livestock Revolution work for the poor. ILRI. Nairobi. Kenya.
- ILRI., 2006. <http://www.ilri.org>
- Jansen, C., Van Den Burg K., 2004. Goat Keeping in the Tropics. CTA (Technical Center for Agriculture and Rural Co-operation), Macmillan Education Ltd.
- Joshi, L., Conroy C., Thaku Y.A. and Vander M.L., 2003. Easing Seasonal Feed Scarcity For Goats In Semi-Arid India Through a Process of Participatory Research.
- Juma, G.P., Drucker, A.G., Baltenweck, I. and Ngigi, M., 2007. Consumption of, and Willingness to Pay for Indigenous Small Ruminants' Meat in Marsabit, Kenya. 12th Annual Conference of the African Econometric Society, 4-6 July 2007, University of Cape Town, South Africa.
- Kapolon, M.L., 2007: Effects of Relief Food Aid on Livestock Management Practices in Turkana District, Kenya. Thesis, Kampala International University
- Kathleen, A., Galvin A., Thorn P.K, Randal L, Boon B. and Sunderland J., 2004. Climate variability and impacts on east African livestock herders: the Maasai of Ngorongoro Conservation Area, Tanzania. Department of Anthropology, Colorado State University.
- Khalid, Z. and Quintana P., 2001. Livestock and Differentiated Rural Livelihood Systems in Northern Pakistan. Masters Thesis, Department of Rural Development Studies, Swedish University of Agricultural Sciences, Uppsala
- Kinaro, Z., 2008. Wetland Conversion to large-scale agricultural production; implications on the livelihoods of rural communities, Yala Swamp, Lake Victoria basin, Kenya. Masters Thesis, Linköping University, Sweden, Department of Water and Environmental Studies (DWES)

- Koczberski, G., Curry, G.N. and Gibson, K., 2001. Improving Productivity of the Smallholder Oil Palm Sector in Papua New Guinea. RSPAS, Australian National University
- Kosgey, I.S., Rowlands G.J, Van Arendonk J.A.M and Baker R.L, 2008. Small Ruminant Production in Smallholder and pastoral/extensive farming systems in Kenya. Department of Animal Sciences, Egerton University, Njoro
- Kothari, C.R., 2004. *Research Methodology: Methods & techniques. 2nd Edition. University of Rajasthan, Jaipur, India.*
- Legesse, B., 2000. *Smallholders' Perception and Coping Strategies. The case of Kersa and Babile, Eastern Ethiopia. Unpublished Masters thesis, Swedish University of Agricultural Sciences, Uppsala.*
- Lukhele, M. and Ramsay K.A., 2002. A Review of the National Goat Development Strategy For South Africa. Department of Agriculture, University of Pretoria.
- Mamabolo, M.J. and Webb E.C., 2005. *Goat Production Survey-Fundamental Aspects To Model Goat Production Systems In Southern Africa, University Of Pretoria, South Africa*
- Mapenyi, N., Gumede S.A and Letty B.A., 2003. Productivity, Management and Utilisation of Indigenous Goat Flocks in Three Rural Communities in Kwazulu Natal. Department of Agricultural Affairs, Farming Systems Research Section, South Africa
- Mazrui, S., 2003. Marketing Approaches Used by Managers to Address Customer Service Challenges in Banking in Kenya, Unpublished MBA thesis, University of Nairobi.
- Mbuku, S.M., 2006. Characterization of the Breeding Practices of the Gabra and the Rendille Pastoralists in Northern Kenya. M.Sc. Thesis, Egerton University, Njoro, Kenya, pp. 84
- Meinzen-Dick, R, Adato, M, Haddad, L and Hazell, P. 2003. Impacts of Agricultural research on poverty: Findings of an integrated economic and social analysis. EPTD 34 Discussion Paper No. 111 and FCND Discussion Paper No. 164. IFPRI. Washington DC. USA.
- Morton, J.F, 2006. Small stock Development Within a Livelihood Context: Personal Reflections. Natural Resources Institute, University of Greenwich, Chatham Maritime, Kent.
- Mtenga, L.A, V.R.M., Muhikambele, Kifaro G.C and Ndemanisho E.E., 2002. Goat Production in Tanzania: An Overview
- Muturi, F.M, Mulinge, W.M, Wandera, E.O., Maingi, P.M., Matata, J.B.W., 2000.

Livestock Survey In The Arid Lands Districts Of Kenya: *Arid Lands Resource Management Project, (ALRMP-II), Office Of The President.*

- Njanja, J.C., Gathuma J.M., Gitau G.K., Njeruh F.M., Kinuthia R.N., 2003. 'Pastoralists' Perception of Livestock Production Systems and Opportunities for Improvement in South western Marsabit, Kenya.
- Njoroge, J.K., 2003. Customers Perception of Service Quality in the Public Utility Sector in Kenya: The Case Study of KPLC after Decentralization of Services, Unpublished MBA project, University of Nairobi.
- Ogola, P. A. and Ngachu, R., 1993. "The contribution of Non- Government Organization to the provision of basic education in Kenya", Nairobi, KIE research report series No 40.
- Oluka, J., Ssewanyana E., Owoyesigire B., Esenu B. and Ssewanyana E., 2004. Smallstock and Women in Livestock Production in The Teso Farming System Region of Uganda
- Omosa, E. K., 2005. The Impacts of Water Conflicts on Pastoral Livelihoods: The Case of Turkana District in Kenya. International Institute for Sustainable Development (IISD)
- Payne, P., and Lipton, M., Longhurst, R., North, J., and Treagust, S., 1994, 'How Third World households adapt to dietary energy stress. The evidence and the issues', Food Policy Review 2, Washington: IFPRI
- Quinn, C H, Huby M., Kiwasila H. and Lovett J.C., 2003. Local perceptions of risk to livelihood in semi-arid Tanzania. Journal of Environmental Management 68, 111-119.
- Russum, M., 2002. Pastoralists: Constraints, Coping Strategies and Viability in Eritrea. In Sustainable Livelihoods of Farmers and Pastoralists in Eritrea: DCG Proceedings No. 8. Ministry of Agriculture, Eritrea
- Rymer, C., 2005. Increasing the Contribution That Goats Make to the Livelihoods of Resource Poor Livestock Keepers In The Himalayan Forest Region. Nutritional Sciences Research Unit, School of Agriculture, Policy and Development, The University of Reading
- Sen, A., 1984, 'Rights and capabilities', in A., Sen, Resources, Values and Development, Oxford: Basil Blackwell: 307-324
- 1987, The Standard of Living, Cambridge: Cambridge University Press
- Chambers R, Conway GR. Sustainable Rural Livelihoods : Practical concepts for the 21st century. 296. 1992. Brighton, Institute of Development Studies.

Sikosana, J.L.N, Banstola B.R, Shretha H.K, Hossain M.m and Sarwer R.H., 2006. Consortium Project on: Importance of Indigenous Tree Fruits (PODS) and Foliage in Goat Diets (L.P.P Project No. @c 0305)

Smith, T., Godfrey S.H, Butterfly P.J and Owen E, 2002. Helping Small stock keepers enhance their Livelihoods. Improving Management of smallholder owned sheep and Goats by Utilising Local Resources. Proceedings of a workshop on enhancing the contribution of small livestock to the livelihoods of resource-poor communities Masaka, Uganda.

Stroebel, A., 2004. *Socio-Economic Complexities of Smallholder resource-Poor Ruminant Livestock Production Systems in Sub-saharan Africa*. PHD Thesis, University of the Free state, South Africa

Tashakkori, A. & Teddlie, C, 1988. *Mixed methodology: Combining Qualitative and Quantitative Approaches*. London: Pp40-58, 61-77

VSF-B, 2005: The role of Livestock in sustainable local development and Poverty reduction, *A symposium paper presented at the House of Parliament, Brussels, Belgium on 15<sup>th</sup> April, 2005*.

Yasmin, F., Haque K.S., & Chowdhury, 2003. *An Econometric study On Semi-Intensive Rearing System, Bangladesh Livestock Research Institute, Bangladesh*.

## 9. ANNEXES

### 9.1 GENERAL HOUSEHOLD CHARACTERISTICS

Serial No:\_\_\_\_\_ Date:\_\_\_\_\_ Interviewer's name: \_\_\_\_\_

Respondent's name: \_\_\_\_\_ Division: \_\_\_\_\_ Location: \_\_\_\_\_

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#### RESPONDENT'S PROFILE

1. **Gender?** Male [ ] Female [ ]
2. **Head of the Household?** Yes [ ] No [ ]
3. **Age Group?**  
Below 20 years [ ] 21- 30 years [ ] 31- 45 years [ ] Over 45 years [ ]
4. **How many people are in your household? Indicate as below**  
Below 5 people [ ] 5- 10 people [ ] Over 10 people [ ]
5. **Gender of people in the household?** Indicate number Males\_ Females \_\_\_\_

#### OCCUPATIONS

##### 6. Occupation (Tick)

- Salaried employment
- Business
- Crop Farming
- Animal Production
- Fishing
- Hunting
- Bee Keeping
- Others (Specify)

##### 7. Which of these animals do you rear?

Cattle [ ] Sheep [ ] Goats [ ] Camel [ ] Donkey [ ] Poultry [ ]  
Others[ ]

##### 8. For how long have you been rearing these animals?

Less than 1 year [ ] 2-5 years [ ] 6-10 years [ ] More that 10 year [ ]

##### 9. What are your main reasons for preferring to rear these animal(s)?

- The buying price is affordable
- They are easy to manage
- They are a means of ploughing
- They require less labour
- They provide money to maintain the family
- They can be sold to provide school fees
- They can be used for cultural rituals

- Pasture and water is readily available for the animals
- They are less prone to theft.
- They are drought resistant
- They are quick to multiply

**PRODUCTIVITY OF GOATS**

**10. How many goats do you have? Indicate as below**

Below 20 goats [ ] 20- 50 goats [ ] 50-100 goats [ ] Over 100 goats [ ]

**11. The number of each sex?**

Males [ ] Females [ ]

**12. For how long have you been rearing goats?**

Less than 1 year [ ] 2-5 years [ ] 6-10 years [ ] More than 10 years [ ]

**13. How did you acquire the goats you are currently rearing?**

Bought [ ] Kinship [ ] Dowry [ ] Raid [ ] Inheritance [ ] Other, specify [ ]

**14. What breed(s) of goats do you keep? \_\_\_\_\_**

Local [ ] Exotic [ ] Others [ ]

**15. Age at first Kidding**

Below 5 months [ ] 5 – 10 months [ ] Over 10 months [ ]

**16. How many kids did you produce last year? Female [ ] Male [ ]**

**17. How many of these kids survived Female [ ] Male [ ]**

**18. What was/were the cause(s) of death?**

Disease [ ] Complicated Birth [ ] Killed by wild animals [ ] Others, specify [ ]

**19. What other challenges do you encounter in the rearing of the goats?**

**INCOME FROM GOATS**

**20. In relation to the goat and it's products, please indicate how you utilize the following :**

Product	Sold	Family use	Kinship	Dowry	Others
Goat					
Milk					
Meat					

Skin					
Blood					
Others (specify)					

**21. Who makes the decision on how to utilise the following?**

Decision maker	Goat	Milk	Meat	Blood	Skin	Others (Specify)
Father						
Mother						
Both father & mother						
Eldest child						
All family members						
Others (specify)						

**22. Regarding the goats, who is in charge of the following activities:**

Activity	Father	Mother	Boys	Girls	Servant	Others (Specify)
Grazing						
Watering						
Milking						
Slaughtering						
Animal Health (Treatment & Vaccination)						
Taking to the market						
Others (Specify)						

**23. Where do you sell the goats/products?** Market [ ] Individuals [ ]  
Other, specify \_\_\_\_\_

**24. How frequently do you sell the products obtained from the goats?**  
Indicate as below

Monthly [ ] Three months [ ] Six months [ ] Over six months [ ]

**25. What motivates you to sell the goat/products?**

Drought [ ] To buy food [ ] Education [ ] Medical care [ ]  
Others, specify \_\_\_\_\_

**26. Indicate the range of income obtained (per month) from the following occupations**

Occupation	Below Kshs 1,000	Kshs 1,000 – 5,000	Kshs 5,000 – 10,000	Above Kshs 10,000
Salaried Employment				
Business				

Crop Farming				
Goats				
Other Animals				
Fishing				
Hunting				
Bee keeping				
Others (Specify)				

**27. On average, how many goats do you lose per year to the following causes?**

Cause	Raid	Disease	Accidental Death	Drought	Others (Specify)
<b>Below 10</b>					
<b>10 – 50</b>					
<b>50 – 100</b>					
<b>Above 100</b>					

**28. How do you spend the income obtained from the goats?**

School Fees [ ] Food [ ] Dowry [ ] Medical [ ] Others, specify \_\_\_\_\_

**29. Do you intend to continue keeping goats as a livelihood strategy?**

Yes [ ] No [ ]

**30. If no, which other livelihood strategies do you intend to pursue?**

Salaried employment [ ]  
 Business [ ]  
 Crop Farming [ ]  
 Other livestock Production [ ]  
 Fishing [ ]  
 Hunting [ ]  
 Bee Keeping [ ]  
 Others (Specify) [ ]

**31. On a scale of 1 – 5, rank the animals based on their contribution to the following:** (1 – Highest 2 – High 3 – Average 4 – Low 5 - Lowest)

	Cattle	Goats	Sheep	Camel	Donkey	Poultry
Milk						
Meat						
Blood						
Hides						
Dowry						
Sale/Income						
Transportation						
Gifts						
School fees						
Payment of						

health Bills						
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**POLICY ENVIRONMENT**

**32. Where do your goats graze ?**

Mountains/hills [ ] River banks [ ] Flatland [ ] Other, specify \_\_\_\_\_

**33. What is the form of ownership of the land on which you graze your goats?**

- ( ) Communal
- ( ) Private
- ( ) Others (specify)

**34. What is the grazing pattern on your goats through out the year?**

Graze same area [ ] Move once [ ] Move twice [ ] More than twice [ ]

**35. What determines the movement of your animals?**

Availability of pasture [ ] Insecurity [ ] Water availability [ ] Season [ ]  
Other, specify \_\_\_\_\_

**36. Indicate your level of agreement with the following statements regarding government policy on goat rearing?**

	Strongly agree	Agree	Not fully agree	Disagree	Strongly disagree
We have enough veterinary offices in our sub-location					
We have public bore holes in the sub-location					
The market place for goats is properly constructed					
We have adequate roads leading to the market place					
Our goats are always vaccinated free of charge					
The community based animal health workers have provided necessary vaccination and treatment to the livestock					
The government offers loans to goat keepers					
The herdsmen are secure in the areas the goats herd					

**37. What other assistance do you require in order to improve your goat rearing? (Please list)**

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## 9.2 GOAT PRODUCTION DISCUSSION GROUP

### 1. Warm up session

- \_ What are your names and occupation?

### 2. General Understanding of respondents on goat rearing, Livelihoods, cultural issues associated with goat husbandry and Marketing

- \_ Which livestock/animals are mostly reared in this area?( List on the flip chart)
- \_ What are the attributes of the above listed animals? (For each, probe on what likes or dislikes)
- \_ Which animals are rarely reared? And why?
- \_ What factors do people in the area consider when deciding on the type of animal to rear?

### 3. Establish the motivators towards, behavior, feelings, attitudes, and opinions on goat rearing

- \_ When I say 'Goat' what comes to your mind? Why? (probe for attitudes on preference)
- \_ What do you like about rearing goats? (probe more on the goat products)
- \_ What is the use of the above products? (Probe on marketing, market value and consumption aspect of the products-include the price of goat in the market).
- \_ What are possible future markets for goats and their products?
- \_ What are the reasons, most households in this village, do not consider goat keeping as a business venture?
- \_ Which other animals are most likely going to be reared apart from the goat?

### 4. Goat husbandry Practices

- \_ If you have both meat producing goats and milk producing goats, and all conditions that favour production of goats for business purposes are put in place, what do you think most households would opt for? Why?
- \_ What are the major threats to successful goat rearing in this area? Please give reasons for the current number and quality of goats. What is the extent of such threats and how do households deal with them?
- \_ What prevalent goat diseases are there in this area? Which traditional methods are used to treat which diseases? (Probe for any conventional ways (including community based animal health workers, used to treat sick goats. Also probe on how the management of diseases of small-stock be improved by specific households).
- \_ How are the goats managed in terms of feeding, health and housing? What knowledge and skills do households have for managing goats? How can the management of diseases affecting goats be improved by specific households?
- \_ Where are the goats grazed? Does the grazing pattern of goats change with season? Why? How are they managed during the dry season? What determines your movement (and settlement) in search of key grazing resources for goats?
- \_ If goat rearing has to be improved in this area which organization/institutions should be doing what?

- What formal training do households require to improve their knowledge and skill on issues concerning goats? (Probe for detailed information e.g. willingness to pay for services, partnering?)
- Are there cultural and ritual aspects that hinder the sale of goats?

### 5. Seasonal calendar and timelines

- Seasonal Calendar: Please indicate below the activities undertaken during each month in relation to goat rearing

Month (Eng)	Month (Turkana)	Activity(ies)	Remarks
January	<i>Lokwang'</i>		
February	<i>Lodung'e</i>		
March	<i>Lomaruk</i>		
April	<i>Titima</i>		
May	<i>El'el</i>		
June	<i>Lochoto</i>		
July	<i>Losuban</i>		
August	<i>Lotiak</i>		
Sept	<i>Lolong'u</i>		
Oct	<i>Lopo</i>		
Nov	<i>Lorara</i>		
Dec	<i>Lomuk</i>		

- Timeline: Please indicate the major drought, epidemic or security events, which have occurred, and which you think have impacted on goat rearing.

	Turkana (Translation)	
Current	<i>Tokona</i>	
2000	<i>Kidiirik/Epompo</i>	
1990	<i>Akalkal</i>	
1980	<i>Lopiar</i>	
1970	<i>Kimududu/Kibekbek</i>	
1960	<i>Namotor/Anyang'adung</i>	

### 9.3 DETAILED INSTITUTIONAL LIVESTOCK PRODUCTION POLICIES AND TRENDS

1. Please comment on the general livelihood trends in the Turkana District.
2. Please comment on livestock production trends in the Turkana District.
3. The literature on goats of this area says that the numbers of goats and sheep has not been increasing for years and may remain like that or even decline in coming years, do you agree? If that is so, what could be the possible reason?
4. Do you know of current and suitable goat breeds kept by the Turkana pastoralists? (Probe for local names given to the breeds)
5. Are there efforts made by the Government and NGOs to introduce other breeds in the area? If yes, what happened to these breeds?(Probe for the suitability of these breeds in respect to drought, diseases, availability of water/pasture etc)
6. Which institutions are currently playing an important role in production of goats? Who makes decisions in such institutions? And how are the

- decisions made? What changes can be brought about in these institutions in order to improve production and marketing of goats/goats products.
7. What opportunities exist that can promote rearing, marketing of goats/goat products?
  8. Are there existing government policies that encourage the marketing of livestock/goats in the district?
  9. Are there health care s (such as vaccination), that use conventional ways of disease prevention and/or cure?
    - a. Who is responsible and how are such s run?
    - b. To what extent are the local farmers (those rearing goats) involved in such s?
  10. What measures have government and non-governmental agencies undertaken in order to improve the availability of water and pastures to the livestock keepers?
  11. What forms of technical support have the government/ non-governmental agencies undertaken support livestock keepers in the district?
  12. How have climatic conditions, insecurity, availability of pasture and water, affected the rearing of goats in the Turkana district? If so, state how (Probe for specific impacts of the various stresses on goat production)
  13. What are the emerging coping strategies to counter the greater impacts of conflict and droughts on goat production?
  14. What role have various members of a household (father, mother, children etc) played in rearing of goats. Have these roles changed with increased exposure to droughts and conflicts? How?
  15. Do you know of any current cultural beliefs and perceptions that constrain goat production in the district?
  16. What are your views regarding the future of Turkana pastoralists in the rearing of goats?
  17. What general comment do you have as far as 'goat rearing as a livelihood of the Turkana pastoralist' is concerned?

## 9.4 INVENTORY OF ALL LIVELIHOOD ACTIVITIES

**Serial Number:** \_\_\_\_\_

Location: \_\_\_\_\_ Division: \_\_\_\_\_

Name of Observer: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**NOTE: Score 1 (for yes)-If the issues stated is correct. 0 (for no) -If the issue stated is incorrect**

	<b>ISSUES</b>	<b>Cattle</b>	<b>Goats</b>	<b>Sheep</b>	<b>Camels</b>	<b>Donkeys</b>	<b>Poultry</b>	<b>REMARKS</b>
<b>1</b>	<b>LIVELIHOODS</b>							
a	The animals found in the area							
b	The animal products in the area i.e. milk, meat, skins, blood							
<b>2</b>	<b>INSTITUTIONAL ISSUES</b>							
a	Presence of institutions dealing with animals i.e. CBO's, NGO's, GOK							
<b>3</b>	<b>CULTURAL ISSUES</b>							
a	There are no rituals hindering the sale of the animal							
<b>4</b>	<b>POLICY ISSUES</b>							
a	Government policy related to marketing of animals							
b	Processing and marketing of animal products							
<b>5</b>	<b>GOAT HUSBANDRY ISSUES</b>							
<b>5.1</b>	<b>Breeds</b>							

a	Breeds adapted to the conditions in the area are present							
b	Animals of various age groups are found in the area							
<b>5.2</b>	<b>Feed</b>							
a	Various feed sources for the animals are found in the area							
b	Only pasture available in the area							
<b>5.3</b>	<b>Diseases</b>							
a	Record of vaccination							
b	Diagnosis reports found in the area							
c	Extension officer or veterinarian visit							
c	Disease management practices for the animals present							
d	Prevention measures for the animals from predators.							
e	Community livestock drug store							
<b>5.4</b>	<b>Labour</b>							
a	Division of labour for the animals present							
b	Care of the animals							
<b>5.5</b>	<b>MARKETING ISSUES</b>							
a	Markets for the animal products							
B	Future markets for stock							

**Other Observation**

Check out for anything exceptional in the village, which may relate to the rearing of goats.

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## 9.5 STUDY LOCATIONS

Constituency/ Region	Division	Location
Turkana North	1. Lokichoggio	Lorau, Nanam, Mogila, Lokichoggio, Loteteleit, Songot
	2. Kaaling	Loruth, Kaikor, Yapakuno, Kaeris
	3. Kibish	Natapal Naita, Kibish
	4. Lapur	Meyan, Kokuro, Karebur
	5. Oropoi	Kalobeyei, Loreng, Letea
	6. Lokitaung	Lokitaung, Ngissinger
	7. Kakuma	Tokomori, Kataboi
Turkana Central	8. Turkwel	Lomeyan, Nadapal, Lorugum, Kotaruk
	9. Loima	Loima, Lokiriama, Lorengippi
	10. Central	Lodwar, Kanamkemer
	11. Kalokol	Kalokol, Namukuse, kangatotha
	12. Kerio	Lorengelup, Kerio, Kangirisae
Turkana South	13. Lokichar	Lochwangamatak, Lokichar, Kalapata
	14. Katilu	Katilu
	15. Kainuk	Kaputir, Kainuk
	16. Lokori	Katilia, Lokori, Kochodin, Lochakula
	17. Lomelo	Kamuge, Napeitom, Lomelo, Kapedo, Nadome

## 9.6 TIME FRAME

Time allocation for different stages in the research proposal: -

Activity	Mar'08	Apr'08	May'08	Jun'08	Jul'08	Aug'08	Sep'08	Oct'08
Data Collection								
Instrument design								
Data collection								
Data Analysis								
Report writing								
Literature review								
Completion								

## 9.7 PROJECT BUDGET

Item/Description	Quantity	Units	Rate US \$	Amount US \$
<b>Personnel</b>				
Research Assistants	12		50	600
Research Assistants Supervisor	1		70	70
<b>Equipment and Supplies</b>				
Survey Materials and Stationery	1		100	100
Data Analysis	1		300	300
<b>Travel and Transport</b>				
Travel cost (Nairobi-Turkana)	1		120	120
Travel Cost (Turkana-Nairobi)	1		120	120
Travel cost within Turkana (three regions)	1		400	200
<b>Miscellaneous Costs</b>				
	1		190	190
<b>TOTAL</b>				<b>1,700</b>